Closing the gap: a review of factors affecting quality improvement interventions at the primary care level

Dissertation Submission

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This dissertation is submitted in fulfilment of the requirements for the degree of Master of Public Health, specialising in Health Economics at the University of Cape Town.

Abstract

Objective

The aim of this review is to analyse quality improvement interventions at the primary care level. Quality improvement interventions attempt to close the gap between clinical research and practice. The objectives of this review are to identify, synthesise and evaluate research literature relevant to primary care regarding quality improvement interventions; as well as identify the enabling and constraining factors impacting quality improvement at the primary care level.

Design

This review involved a qualitative, systematic review of previously undertaken qualitative research.

Data sources

Data was sourced from electronic databases PubMed and CINAHL.

Study selection

Articles were selected based on their relevance and published in English in an academic journal between June 2001 and June 2011, using qualitative data collection and analysis methods to assess a quality improvement intervention at the primary care level.

Data extraction

Data was extracted from the articles' 'findings' and 'discussion' sections.

Data synthesis

110 articles were identified, 11 of which were included. Thematic analysis occurred in three stages: line-by-line coding, creation of descriptive themes, and creation of analytical themes.

Conclusion

Interventions aimed at quality improvement in primary care do not experience uniform ease of implementation. It is possible to create the conditions necessary for success by harnessing human capital; creating a nurturing, supportive and collaborative working environment; and providing inspirational leadership through management.

Keywords

Primary care, quality improvement, intervention, qualitative approaches, systematic review

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Background

The constitution of the World Health Organisation (1997) includes "the enjoyment of the highest attainable standard of health as one of the fundamental rights of every human being without the distinction of race, religion, political belief, economic or social condition." Primary care is recognized as a core component of that right. As such, citizens, as patients, should be afforded accessible, available, acceptable, and quality health care. This implies that health care facilities and services should function and exist in adequate supply; be affordable, understandable, physically accessible and non discriminatory; uphold sectorial ethics and maintain appropriate population sensitivities; and be scientifically and medically appropriate (WHO, 1997). While high quality health care may not be a core component or bare minimum requirement of care, it is an aspect of care which allows the overall provision of universal care, to be delivered to all.

A review of the literature available on the topic of quality improvement in primary care reveals a wealth of research in high-income countries. Much less literature exists which deals with low- to middle-income countries. The general global consensus is that the role of primary care is invaluable in reducing health inequality. In an analysis of preventable deaths in children in 41 countries, it was determined that 63% of deaths may have been avoided if primary care was fully implemented (Starfield et al., 2005).

Question

What enables and constrains implementation of quality improvement interventions at the primary care level?

Aim and Objectives

The aim of this review is to:

- Analyse quality improvement interventions at the primary care level (which attempt to close the gap between clinical research and practice)

The objectives of this review are to:

- Identify, synthesize and evaluate research literature of relevance to primary care regarding quality improvement interventions
- Identify the enabling and constraining factors of quality improvement at the primary care level

Justification

Healthcare delivery has evolved into a complex field, which is often characterized by a multiplicity of general and specialized care providers, governance institutions and payer arrangements. For the purpose of this study, it was deemed necessary to limit research to a finite area. Primary care was selected as the area of focus, for two principal reasons. Firstly, primary care is regarded as the entry point into the health system for clients, from which they typically find

their way into other parts of the system. The nature and extent of this progression through the system is somewhat determined by the efficacy of the care received at the point of entry. It may therefore be logically expected that the many-faceted outcomes of any episode of care may be impacted by efficient and effective primary care. Secondly, primary care occupies a position of particular importance in relation to citizens' rights, as discussed in this paper. This implies that such care should not merely be nominally present, but should be delivered to the fullest extent afforded by available resources, an ideal which has at present not been universally attained. Consequently, quality improvement initiatives in primary care were singled out for review. It is expected that not all such initiatives will meet with uniform success, and that this variability may be accompanied by a variety of factors that impede or facilitate success. If quality is a desired attribute of a universal right, then a review of empirical, documented experiences in effecting quality improvements may be considered important for creating the necessary conditions for success.

In order to maintain the integrity, and limit the scope, of any inquiry into this field it is necessary to provide to an unambiguous definition of primary care. Primary care is frequently confused and conflated with primary health care. The notion of primary health care was formalised at the 1978 World Health Assembly in Alma Ata, with the aim of accessible and affordable health care for all (World Health Organisation, 1978). Primary health care is an overarching, community focused approach to health system development. Primary health care encompasses but extends beyond primary care.

The notion of primary care was first introduced in 1920 in the Dawson Report, but only effectively adopted in 1961 by White, Williams, and Greenberg in *The Ecology of Medical Care* report (Starfield et al., 2005). Over time, it has been defined in several different ways, as the word "primary" is subject to differing interpretations. The first understanding of "primary" denotes a time or order, leading primary care to be construed as the first point of contact or entry into a health care system. The second interpretation of "primary" is as principal care, or as being central to health care.

Simply stated, primary care is "first-contact, continuous, comprehensive, and coordinated care provided to populations undifferentiated by gender, disease, or organ system (Starfield, 1994)." An extended definition by the Institute of Medicine (1994), is "the provision of integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients, and practicing in the context of family and community." An earlier definition provided by the Institute of Medicine (1978) stresses accessibility, comprehensiveness, coordination, continuous care and accountability. Both of these definitions place emphasis on the direct delivery of services to the patient. The Institute of Medicine's definitions and outline have formed the template on which primary care reform is based and has influenced the creation of quality assessment tools

for high-income countries (Hogg et al., 2007). Starfield et al. (2005) outline the four core components of primary care as: the first access point for every new health need; long term person-centered care; comprehensive care for the majority of health needs; and coordination of care for services that need to be sought elsewhere. In the US, primary care workers are medical doctors, osteopathic doctors, and nurse practitioners (New England Healthcare Institute, 2009). Support workers include general physician assistants in family practice, internal medicine and paediatrics (New England Healthcare Institute, 2009).

While these definitions of primary care emanate from sources in developed and affluent countries, they are arguably applicable to low income countries as well, according to the principle of universality, regardless of "economic or social condition", as contained in the declaration of the World Health Organisation (1997). The inclusion of the concept of universality suggests that, while much of the research into primary care improvements has occurred in a developed setting, the benefits arising from the research should be applied to the benefit of all. Given the scarcity of resources typically found in developing societies, it is imperative that due consideration be given to learning from the experimental investments of more affluent countries. Thus, not only primary care should be universally available; better quality care should also be accessible by all.

Having defined the concept of primary care, it is necessary to consider its importance in the overall provision of care, and the extent to which it deserves particular scrutiny and emphasis. Primary level care provides care to the general population, and encompasses the most prevalent health issues. As such, primary care is a less costly form of health care provision which reaches the most people. As primary care is the first point of contact, it serves to act as an effective gatekeeper for specialist services. Patients are required to visit a primary care physician to seek a referral before consulting with a specialist (Starfield, 1994). Gatekeeping protects the health of the patient by eliminating unnecessarily severe procedures and possible adverse effects. Gatekeeping also protects health systems by preserving a patient's health and reducing costs, by reducing the utilisation of specialists, who use greater quantities of more expensive tests and procedures (Starfield, 1994).

The likely benefits of optimized primary care delivery also requires examination. In two studies of middle- and high-income countries, those countries requiring referrals for specialists reported lower health care and outpatient costs and an increase in patient satisfaction (Engstrom et al., 2001). Patients with primary care physicians, especially those with longer continuity of care, received better recognition and diagnosis of psychosocial issues (Engstrom et al., 2001). Separates studies investigating the strength of primary care conducted in Canada, the United States, Cuba and Costa Rica agree that patients who either sought primary care, or were referred by a primary care physician, experience fewer complications than patients who visited only specialists (Starfield et al.,

2005). Further studies conducted in high-income countries support this (Starfield et al., 2005).

The outcomes that may be attributable to functioning primary care delivery being present have been extensively documented in various countries. In the United States, areas with a higher ratio of primary care physicians per population reported better health outcomes than areas with a lower ratio, even after controls for socio-demographic factors (Shi et al., 2002). The same is true of the United Kingdom (Gulliford, 2002 as cited in Starfield et al., 2005). Primary level care is associated with the equitable distribution of health care, translating into a wider provision of services to a wider population of people (Starfield et al., 2005). In a study of seven African countries, distribution of government spending was more equitable in the health sector than it was overall for all other sectors combined (Castro-Leal et al., 2000 as cited in Starfield et al., 2005). Developing countries require equity and sustainability (Hanna and Kangolle, 2010). As societies progress along the development curve, it may be expected that new and different types of care will be demanded, for example in ageing populations, as life expectancy improves. At the same time, developing countries must continue to include prevention along with the treatment of chronic diseases. (Hanna and Kangolle, 2010). Cost effective disease control interventions are also necessary, as they have proven to eradicate diseases while alleviating burden on the health care sector (Mamlin et al., 2006). This suggests that finite resources may need to be allocated according to changing priorities, balancing the need for preventative, curative and chronic care, while meeting increasing demands.

As health care becomes increasingly expensive due to the advancements in new medical technologies, aging populations and increased incomes, all countries are under great pressure to reform their health systems (Jenkner and Leive, 2010). Each year in the United States, between 44,000 and 98,000 lives are lost to preventable medical errors (Institute of Medicine, 1999). The World Health Organisation (2010) estimates that between 20% and 40% of health resources are wasted. Due to misuse of resources, primary care level facilities often perform below adequate measures of quality (Berwick, 2002). Increasing the quality of primary care has a positive impact on the cost, consumption and satisfaction rating of health care. Health care consumption and costs will decrease, while patient satisfaction and the contribution to overall health systems will increase (Engstrom et al., 2001). Reduced costs are attributed to improved preventative care and a reduced number of hospitalizations (Starfield et al., 2005). Quality improvement measures are necessary to strength both health care process and facilities, ultimately improving health care systems. Health care systems in developing countries were traditionally designed to manage primarily infectious diseases, as well as child health and maternal health. As such, these systems may not be inherently equipped to deal effectively with a broader range of care demands, and it is likely that some intervention is needed to increase their capacity and capability.

Disparities in the success of interventions across different economic settings require consideration. If universality is accepted as an important component of primary care, it may be instructive to understand the extent to which abundant resources impact on the success of quality improvement initiatives. In reviewing the available literature, it becomes apparent that the range of quality improvement interventions employed in low- and middle-income countries differ significantly from those typically implemented in high-income countries. In the former group, interventions tend to be focused at the systemic level, with examples ranging from technology improvements, such as implementing electronic patient records, to improvements in collaboration (Mamlin et al., 2006; Peabody et al., 2006). In the latter group of countries, by contrast, interventions tend to be directed at personal productivity, performance, and compliance with established protocols and best practices. Developing countries have an interest in quality of care as an increasing number of burdens threaten the health of patients in low-income countries. Peabody et al. (2006) assert that care of high quality can be provided even in resources constrained systems. Quality interventions will be necessary in streamlined inefficient processes and standards of care so that these countries can deal with a new set of problems. It may be that developed countries have already had the opportunity to apply time and financial resources to basic systemic improvements, while developing countries have yet to do so on an effective scale. While these differences are noted for the purposes of rigour in comparison, it is not be inferred that they necessarily limit the applicability of any intervention to one, particular setting.

The value of this study lies in its contribution of a broad, global perspective to the existing literature. As of June 2011, no systematic review has assessed qualitative research into quality assurance and improvement interventions in primary care in a global context. Recent systematic reviews evaluating quality in primary health care either appraise a single quality improvement intervention or interventions for a specific disease. This study seeks to add to the body of literature by providing a review which spans multiple interventions across multiple diseases and studies drawn from different countries of different income levels.

The contribution of a such a wide-ranging review likely lies in the experiential learning that can be generalised across country settings. If, for example, the emergence of systemic excellence in high-income countries is due to the application of greater resources over time, it may be expected that the advances gained can be transferred to low- and middle-income countries, without the latter having to repeat the same protracted journey. This implies that the learning investment in high-income may potentially be exploited by less affluent societies, which would enable them to effect systematic improvements more quickly and less expensively. Understanding the constraints, and the conditions for success, of documented interventions may also provide valuable insights in replicating such enabling conditions in other settings. The extent to which success depended on the conceptual soundness of interventions, versus the careful execution of the interventions, should also become clear. This may suggest the

relative emphasis that should be placed on strategy formulation and strategy execution, respectively.

Conducting such a study required a thorough review of previously documented experience. PubMed and CINHAL were extensively searched for existing systematic reviews in similar topic areas. Using multiple combinations of relevant terms, and further manual searching, several hundreds of search results were evaluated. No systematic review, involving qualitative research methods, investigated enabling and constraining factors of quality improvements were found.

A qualitative systematic review, assessing quality improvements at the primary care level, will investigate enabling and constraining factors of quality improvement interventions and initiatives. This review will provide an overview that may be consulted by health care management professionals and policy makers when considering quality improvement strategies in primary care.

Updated reviews can lead to quicker implementation of diagnostic or treatment tools (Chalmers and Altman, 1995). Health professionals and policy makers can use systematic reviews to guide decision-making, rather than be overwhelmed by information. Systematic reviews synthesise and refine mass amounts of literature, and allow for a brief overview and critical evaluation of relevant studies. Further information on systematic reviews can be found in the Methodology section of this paper.

Methodology

Study Design

The study will involve a qualitative, systematic review of prior qualitative research. Systematic reviews are methodical literature reviews which summarise existing research evidence (Hemingway and Brereton, 2009). Due to time and financial constraints in health care, systematic reviews are considered an efficient scientific technique. Systematic reviews derive scientific data from primary studies instead of “cell lines, animal models or human subjects” (Grimshaw, 2010, p.8). Reviews can be less time consuming and less costly than initiating a new study. Reviews provide an ‘interpretive context’ that cannot be found in a single study (Chalmers and Altman, 1995). Single studies may also be susceptible to chance or bias (Grimshaw, 2010).

Systematic reviews typically include random control trials and other quantitative research methods (Dixon-Woods and Fitzpatrick, 2001). Classically, the gold standard in research has been seen as the randomised control trial, bested only by systematic reviews of randomised control trials. A single clinical trial cannot provide an accepted answer about an intervention or treatment (Cook et al., 1997). Systematic reviews can, however, compile multiple trials so that an accepted answer can be formulated. Systematic reviews also allow an

understanding of trial particulars and peculiarities that cannot be inferred from a single trial. As such, systematic reviews allow judgments about generalisability and consistency (Cook et al., 1994).

Careful consideration has been given to the validity and applicability of the systematic review method to this study. Systematic reviews have traditionally been quantitative in nature, and are aimed at answering a specific question about a particular clinical intervention. The question includes a target population and setting; a condition or disease of interest; an exposure to an intervention, test or treatment; and at least one specific outcome (Cook et al., 1997). Reviews typically aim to reach consensus on economic evaluations, derived treatment or intervention value, and expected outcomes (Cook et al., 1997). Reviews therefore tend to evaluate impact.

A growing consensus exists that the value of systematic reviews is not limited to quantitative studies. Systematic reviews involving quantitative research do not provide information on decision-making factors, motivations or experiences (Dixon-Woods and Fitzpatrick, 2001). Qualitative data is more detailed in meaning and context (Popay et al., 1998). Qualitative research tends to provide a deeper, richer insight into context than random controlled trials (Popay et al., 1998).

The growing consensus, referred to above, is evident in the increased number of qualitative and mixed-method reviews that have emerged, broadening the scope of published literature. Although the use of qualitative research in systematic reviews is still evolving, its application is steadily improving. The surge of qualitative studies in healthcare also requires a new form of synthesis (Dixon-Woods and Fitzpatrick, 2001). Fairhurst and Huby (1998; as cited in Dixon-Woods and Fitzpatrick, 2001) make the case that doctors use trial results for practical knowledge improvement, not because of their academic rigor, but for the value of the trial context. The systematic review of qualitative research allows for a critical overview that is beneficial to health professionals and policy makers alike. The aim of this study is to identify the elements that have been found to be supportive in implementing quality improvement initiatives, rather than to measure the quantifiable outcomes of the interventions themselves. Qualitative data can therefore be regarded as being more relevant and valuable to the aims of the study.

Grimshaw (2010) recommends that syntheses follow a set of general steps: stating research objectives; defining study eligibility criteria; identifying potentially eligible studies; applying eligibility criteria; assembling a complete data set by way of data extraction; appraising study quality; analyzing data set; reporting on the research. Synthesis must adhere to principles of rigour - with methods both reproducible and transparent.

Drawing on this general approach, this review follows the methodological steps derived from Thomas and Harden (2008), who have developed an easily understandable approach to the synthesis of findings of qualitative research that is appropriate for use in public health. Thomas and Harden's approach was adopted for this work for its ease of use for new researchers, providing step-by-step guidance, as well as its prior use in the field of health. Thematic synthesis is acknowledged as a clear approach, in an otherwise murky field of qualitative methods, for inexperienced analysts to use (Howitt and Cramer, 2010). Methodological steps include searching by using specific keyword terms; assessing the quality of results using specified criteria; data extraction using specified criteria; translating concepts/synthesis by way of coding, developing descriptive themes, developing analytical themes, analysis and discussion of results (Thomas and Harden, 2008). Measures such as checklists and extraction sheets will be implemented to control quality, and are appended. All attempts have been made to develop a clear and transparent process.

Search Strategy

The tasks associated with this step are the following:

- Identify appropriate data sources
- Define inclusion and exclusion criteria for sources
- Formulate search terms
- Search data bases using search terms
- Refine search terms
- Repeat search with refined terms
- Document search process and results

An exhaustive search for English literature will be undertaken using PubMed and the Cumulative Index to Nursing and Allied Health Literature (CINAHL). PubMed is a comprehensive medical journal database, which includes MEDLINE results. CINAHL is an extensive nursing and allied health literature resource. Grey literature will not be considered.

Articles published after the release of the report *Crossing the Quality Chasm: A New Health System for the 21st Century* will be considered (Institute of Medicine, 2001). The report, published by the Institute of Medicine's Committee on Quality of Health Care in America in March 2001, detailed the need for quality improvements in primary care in the United States, in order to close the gap between clinical experience and practice. In addition to highlighting issues, the report emphasized possible strategies to improve quality in the health care system. The Institute of Medicine is a respected independent and non-profit organisation that publishes unbiased reports for use by policy makers and the general public. Reports focus on various issues in health care and medicine, in low-income, middle-income and high-income countries.

The publication date parameters chosen for the inclusion of articles is based on a number of relevant factors. Quality improvements became a topic of discussion in low- and middle-income countries a number of years prior to the release of this report (Reerink and Sauerborn, 1996). Although challenges such as reliable documentation and information systems remain, preconceived notions about the expense and required resources of quality were dispelled, (Reerink and Sauerborn, 1996). Emerging interest in quality of care can be seen in the creation of policies to. South Africa implemented "A Policy on Quality in Health Care in South Africa" in 2001 (Department of Health, 2001).

All relevant articles published following the release *Crossing the Quality Chasm* will likely have considered the report. A cushion period of three months has been afforded to account for publication time cycles. Publication dates will therefore be restricted from June 2001 to June 2011.

As the review will have a global perspective, no geographic specific search terms will be included.

Several combinations of words and Boolean phrases were tested. Search words were selected for topic relevance and the ability to narrow results. As qualitative research involves a wide variety of techniques, specific methodological search terms were omitted. Keywords were selected which elicited a response from both PubMed and CINAHL.

The following set of search terms will be used to search article titles and abstracts in both PubMed and CINAHL: "primary care" AND quality AND (improv* OR assurance) AND intervention. The search process will be recorded.

Table 1: Search Process

Database	Search terms	Total hits	Included hits

Article Selection

The tasks associated with this step are the following:

- Check resulting articles against inclusion criteria
- Vet search results for relevance
- Note irrelevant articles which are excluded

Articles' relevance will be determined in relation to meeting strict inclusion criteria. Articles that do not meet the criteria are not deemed acceptable for inclusion in the systematic review.

Table 2: Article Selection Criteria

	Inclusion	Exclusion
Source	Academic journal	Not sourced from an academic journal
Date Published	Between June 2001 and June 2011	Prior to June 2001
Language	English	Not in English
Article	Abstract available	Abstract unavailable
	Full free article available under university subscription service	Full article unavailable
	References available	References unavailable
Research design	Qualitative data collection and analysis methods	Strictly quantitative methodology
Topic	Quality improvements interventions	No intervention
	Primary care level	Not at the primary care level
	Relevant to research question	Not relevant to research question

Due to the possibility of inadequate or improper database referencing, literature will be further inspected for relevance of content. Articles may have incorrectly or misleadingly labelled keywords. Further inspection of articles will ensure that only appropriate literature will be included in the review. Article abstracts, and articles themselves as needed, will be read to confirm appropriateness of inclusion. Excluded articles will be noted.

Table 3: Excluded Articles

Article Title	Author/s and date	Reason

Critical Appraisal

The tasks associated with this step are the following:

- Assess articles against Critical Appraisal Tool
- Answer prompting questions with comments
- Complete article summary form for passing articles

Literature will be assessed using the appended Critical Appraisal Tool, produced by the Critical Appraisals Skills Programmes, developed by Oxford University Public Health Resources Unit (Milton Keynes Primary Care Trust, 2002). As a number of Critical Appraisals Skills Programmes criteria exist, the Critical Appraisal Tool has been designed as an aid for those less familiar with qualitative research, leading the investigator to think critically about appraisal. The Critical Appraisal Tool (Appendix 1) will be used to guide judgment on article inclusion. The tool includes basic questions, with detailed prompts, that will aid in determining an article's quality. Articles will be systematically assessed according

to their research design, sampling strategy, data collection, reflexivity, ethics, analysis, findings, value of research, and persuasiveness of argument.

Each appraisal will contain an open text comment portion, which will be used to track the principal investigator's judgment. Articles may be reassessed according to other articles. All assessment activity will be logged.

All articles deemed acceptable for inclusion by the principal investigator will be subject to an article summary form (Appendix 2). This tool will be used to systematically extract pertinent information and summarize data from articles. Structured, concise summaries will allow for easy retrieval of pertinent study information. This ensures that, during coding and development of themes, the specifics of each study are not ignored.

Data Collection

The tasks associated with this step are the following:

- Read articles
- Extract data from article findings
- Note extracted data on article summary form
- Note authorial judgment of data

Data will be extracted from an article's study findings. There is no uniform method of reporting a study's findings. Some text, such as direct quotes, is more easily identified than others, such as finding summaries (Thomas and Harden, 2008). This conundrum is termed "signal-to-noise" (Booth, 2001). The "signal" is the primary verbatim data, whereas the "noise" is the author's interpretation of that data (Booth, 2001). This delineation can also be differentiated as "data" and "findings". "Data" pertains to direct quotes from study participants, whereas "findings" pertains to a researcher's treatment of these quotes (Sandelowski and Barroso, 2003). It is understood that that data presented in their "raw" form have sufficient meaning, without a researcher interpreting further meaning (Sandelowski and Barroso, 2003). The author includes only the most relevant data, although that may only be data the author judges to be relevant. Therefore, all relevant text located in sections labelled 'results' or 'findings' in articles will be considered as study findings (Thomas and Harden, 2008). In some cases, results sections are used only to report basis findings, and findings are discussed within the 'discussion' component of an article. As such, all relevant text located in sections labeled 'discussion' will be considered as study findings. This will be judged on a per paper basis. Authorial interpretation and judgment will be noted.

This text will be isolated and synthesized. Distinction will be made between the authorial intent or interpretation of data, and the actual reported data themselves. Extracted text and article summaries will be read closely. Detailed reading will allow for familiarity with content and an overview of potential themes (Thomas, 2003).

Data Analysis

The tasks associated with this step are the following:

- Identify data to be analysed
- Code data in coding chart
    - Assign basic codes per line of data
    - Recode coded data by assigning descriptive codes to like groupings
    - Assign analytical codes
- Repeat coding process as necessary
- Track code definitions in Code Log.

Data will be analysed using thematic analysis, as outlined by Thomas and Harden (2008). Analysis will occur in three stages: line-by-line coding, creation of descriptive themes, and creation of analytical themes. Coding will largely be an inductive process, with codes and themes emerging from the text (Thomas, 2003). This will allow meaning to be attributed to experiences and knowledge that emerge from the text (Sandelowski et al., 1992).

As a limited number of articles is expected to meet inclusion criteria, coding will occur by hand to allow for maximum control. All data and codes will be exported to a chart to allow for systematic tracking. Charts will also aid data reviews, allowing for easy recall of data without re-examining the original text. The chart will be hosted within Microsoft Word, which incorporates a text search function.

Table 4: Coding Chart

Article Title and Author/s	**Label**	**Text**

Coding related to the enabling and constraining factors of quality improvement interventions will be a strictly inductive process.

Step one: Line-by-line coding

Text will be coded at least every sentence. Definitions of codes will be recorded, and adjusted as necessary. A code log will be kept in the event that a code definition is changed (Ulin et al., 2005).

Table 5: Code Log

Code	**Initial Definition**	**Revision**	**Date**	**Article, Notes**
Example				

Step two: Develop descriptive themes

Similar codes will be grouped and organised into a hierarchal structure. This will allow for natural groupings of codes. New codes will be created to capture the overall meaning of groupings (Thomas and Harden, 2003).

Step three: Create analytical themes
The resulting codes will be analysed and given new themes, in relation to the research question. Themes will have greater relevance to the research question than to the original study text (Thomas and Harden, 2003). Themes may be codes which will be inferred, and not sourced from the study text itself. Synthesis involves interpretation of the data, the article and the amalgamation of articles. This undertaking of continuous synthesis extracts meaning, which is removed from the original intent of the data (Thomas and Harden, 2003). This potentially allows for a greater understanding than could be provided in an empirical study.

The process will be repeated until sufficiently abstract and analytical terms surface, which reveal underlying implementation factors in exact language, rather than in simple anecdotal accounts. In some cases, literature and theory may suggest appropriate codes which will be used as to guide thinking about the nature of quality improvement interventions. This is important due to the vast range of quality improvement interventions that assess various aspects of quality in primary care. These literature drive codes include, but are not limited to, the following:

- Stakeholder focus, such as patient/client, professional/health worker, and provider/management (Ovretveit, 1998).
- Type of quality improvement, such as process, structure, and outcome (Donabedian, 1980).
- Aspects of quality, such as safety, effectiveness, patient-centeredness, efficiency, equity, and timeliness (Institute of Medicine, 2001).

Timeline
Table 6: Timeline

Dissertation Component	**Activities**	**Dates**
Protocol	Topic formulation	Month of May
	Draft	Month of June
	Edit and rewrite	First week of July
	Submission to department	July 20
Literature review	Research	May – June
	Draft	Month of July
	Edit and rewrite	July 20 – August 20
Article	Data Collection	Second week of July
	Data Analysis	July 20 –August 20
	Write Up	August 20 – Sept 1
	Edit and rewrite	September - October
Editorial/opinion piece	Draft	First week of October
	Edit	Month of October

Limitations

Systematic reviews do not replace expert advice or empirical research.

Systematic reviews involve a methodical process of selecting articles that assumes published literature to be comprehensive. Relevant articles may not yet be published, nor published in journals selected by PubMed or CINHAL. Additionally, systematic reviews can be subject to a publication bias, where studies with favourable results are more likely to be published. Hand searches of relevant journals will attempt to alleviate both of these concerns.

Finally, the principal investigator will have to make judgments. The guidance of a strict protocol should assist the principal investigator in drawing conclusions.

Dissemination

The systematic review will be submitted to *Quality Management in Healthcare* for consideration of publication. As a peer-reviewed journal, *Quality Management in Healthcare* investigates the features of health care quality management. The journal accepts relevant articles of any length. Author instructions are appended (Appendix 3). Citations will be amended prior to article submission.

An editorial or opinion piece will also be written. The piece will cover a topic of concern that emerges from analysis. The piece will be submitted to an appropriate publication, depending on the nature of the topic. This piece will be more "popular" in nature, and be written for a general audience.

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Closing the gap: a review of factors affecting quality improvement interventions at the primary care level

Part B: Literature Review

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Objectives and Overview

This review scopes the terrain of primary care literature, with particular reference to quality of care, with the goal of identifying gaps which may require further research, and specifically, secondary research, or a systematic review. This literature review provides an overview of primary care, and defines the concepts of 'quality' and 'quality improvements' within it. It outlines the importance of primary care in a health system, the key quality issues for primary care, and the available approaches to improve primary care quality.

Overall, this review highlights the importance of improving the quality of primary care in any health system, the range of higher income country experience in the field, as well as the growing interest in low and middle income countries (LMICs) – and the yet still relatively limited empirical evidence about quality improvement from these latter settings. To support health system development in LMICs, it is therefore valuable to review existing, relevant experience from across a range of country settings, as a basis for drawing out relevant lessons for future LMIC action. This scoping review points to the particular importance of a systematic review of existing evidence, addressing the question: 'What enables and constrains the implementation of quality improvement interventions at the primary care level?', as presented in Part B. The review also outlines the appropriate approach and methods required in undertaking a systematic review of qualitative literature.

Search Strategy

Literature was sourced from peer-reviewed journals, published in English, using databases such as Medline and PUBMED. A variety of combinations of relevant search terms was used, as seen in the following table. Relevant articles' reference lists were used in a snowball approach, to generate further literature. Articles from both low and middle-income countries and high-income countries were evaluated to obtain a sense of the available literature across settings.

Search Terms:

Phase One	Phase Two
"primary care" AND quality AND (improv* OR assurance) AND intervention NOT (review or quantitative or trial)	"primary care" AND quality AND (improv* OR assurance) AND intervention

This review does not intend to be comprehensive, but is instead targeted at a very specific topic. While a wealth of primary care literature exists, literature was selected based on contributions to the study of quality of primary care, specifically involving quality improvement. Articles were chosen based on their inclusion in a peer-reviewed journal, thus assuring research is of the highest

quality. Literature in the form of reports from well-established and reputed institutions and organizations was also included. Other grey literature was not included.

State of the Literature on Primary Care and on Quality of Care

Health and Health Care

The right to a healthy life, and health care which supports it, is universal. The constitution of the World Health Organization (1997) includes "the enjoyment of the highest attainable standard of health as one of the fundamental rights of every human being without the distinction of race, religion, political belief, economic or social condition (p.1)" Health care is recognized as a core component of that right. As such, citizens, as patients, should be afforded accessible, available, acceptable and high quality health care. This implies that health care facilities and personal services should function and exist in adequate supply; be affordable, understandable, physically accessible and non discriminatory; uphold sectorial ethics and maintain appropriate population sensitivities; and be scientifically and medically appropriate (World Health Organization, 1997). In addition, quality is an important aspect of health care, as higher quality of care offers the promise of enhanced clinical performance, better health outcomes, decreased health expenditure, and increased patient satisfaction. However, health care facilities often perform below adequate measures of quality (Institute of Medicine, 1999). As such, quality improvement measures are necessary to strengthen both health care facilities and health care systems, and to achieve the objective of universal care.

The notion of primary health care is an important element of health and health care debates worldwide. It was born out of the Alma Ata declaration in 1978 at the International Conference on Primary Health Care (World Health Organization, 1978). With an overall goal of "better health for all," primary health care was introduced as a new approach to care. The accepted definition of primary health care as:

> "essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and the country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination (World Health Organization, 1978, p.1)".

While these ideals may appear to be lofty, experience shows that, where primary health care has been implemented within health systems, there are practical and positive repercussions for population health (Gilson et al., 2007). Consequently, all countries, especially in the developing world, were encouraged to create and

implement a system of primary health care, in keeping with the notions of social justice, participation, and solidarity (World Health Organization, 1978; World Health Organization, 2008).

Primary health care is a community-focused approach to care (World Health Organization, 1978); as an approach to health systems development, it demands active engagement with community actors, such as community organizations or councils. It also addresses a broad set of health issues affecting communities, using a wide range of strategies, rather than only focusing on the provision of medical care. Primary health care thus encourages a population or community approach, utilizing health promotion and other preventative and educational tools (World Health Organization, 1978).

In addition to this community focus, primary health care recognizes primary level care as existing in a larger context, as a component of an integrated provision of comprehensive health care. Patients navigate the larger health system and its referral services via primary care (Gilson et al., 2007). Primary health care thus encompasses primary care.

Primary Care

The notion of primary care was introduced to the world by the UK in 1920 in the Dawson Report, but only effectively adopted in 1961 by White, Williams, and Greenberg in The Ecology of Medical Care report (Starfield et al., 2005). Over time, it has been defined in several different ways, as the word "primary" is subject to differing interpretations. The first understanding of "primary" denotes a time or order, leading primary care to be construed as the first point of contact or entry into a health care system. The second interpretation of "primary" is as principal care, or as central to health care.

Consequently, different definitions emphasise particular attributes of primary care, but are not contradictory or mutually exclusive of each other. Simply stated, primary care is "first-contact, continuous, comprehensive, and coordinated care provided to populations undifferentiated by gender, disease, or organ system (Starfield, 1994, p.1129)." An extended definition by the US Institute of Medicine, a respected and independent non-profit organization, defines primary care as "the provision of integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients, and practicing in the context of family and community (Donavon et al., 1996, p.1)." An earlier definition provided by the Institute of Medicine (1978) stresses the notions of accessibility, comprehensiveness, coordination, continuous care and accountability. Both of these definitions place emphasis on the direct delivery of services to the patient. The Institute of Medicine's definitions and outline have formed the template on which primary care reform is based, and has influenced the creation of quality assessment tools for high-income countries (Hogg et al., 2007). Starfield et al. (2005) outline the four essential components of primary care as: the first access

point for every new health need; long term person-centred care; comprehensive care for the majority of health needs; and coordination of care for services that need to be sought elsewhere.

Role and Organization of Primary Care

Having defined the concept of primary care, it is necessary to consider its importance in the overall provision of care, and the extent to which it deserves particular scrutiny and emphasis. Primary level care provides care to the general population, and encompasses care for the most prevalent health needs. Primary care is a less costly form of health care provision which reaches the most people. As it is also the first point of contact, it serves to act as an effective gatekeeper for specialist services. Patients are required to visit a primary care physician to seek a referral before consulting with a specialist (Starfield, 1994). Gatekeeping protects the health of the patient by eliminating unnecessarily severe procedures and possible adverse effects. Gatekeeping also protects health systems, by preserving a patient's health and reducing costs, as well as by reducing the utilisation of specialists who use greater quantities of more expensive tests and procedures (Starfield, 1994).

The manner in which primary care is organized differs across various parts of the world. Differences in organization of care – notably in gatekeeping and financing arrangements - are associated with differences in practices and the execution of care (Gervas et al., 1994). Distinct benefits appear to be associated with some of these different arrangements, which govern the context of primary care within the overall provision of care, particularly the manner in which it acts as an entry point to the health system. In two studies of middle- and high-income countries, those countries requiring referrals for specialists reported lower health care and outpatient costs and an increase in patient satisfaction (Engstrom et al., 2001). Patients with primary care physicians, especially those with longer continuity of care, received better recognition and diagnosis of psychosocial issues (Engstrom et al., 2001). Separate studies investigating the strength of primary care conducted in Canada, the United States, Cuba and Costa Rica agree that patients who either sought primary care, or were referred from a primary care physician, experience fewer complications than patients who only visited specialists (Starfield et al., 2005). Further studies conducted in high-income countries support this (Starfield et al., 2005).

Other outcomes that may be attributable to the presence of functioning primary care delivery have been extensively documented in various countries. In the United States, areas with a higher ratio of primary care physicians per population reported better health outcomes than areas with a lower ratio, even after controls for socio-demographic factors (Shi et al., 2002). The same is true of the United Kingdom (Gulliford, 2002 as cited in Starfield et al., 2005). Primary level care is associated with the equitable distribution of health care, translating into a wider provision of personal services to a wider population of people (Starfield et al., 2005). In a study of seven African countries, distribution of government spending

was more equitable in the health sector than it was overall for all other sectors combined, which may suggest that equity in health spending can serve an exemplary or leadership role, for emulation by other ministries (Castro-Leal et al., 2000 as cited in Starfield et al., 2005). This has been identified as being of particular importance to developing countries, which have a high requirement for equity and sustainability (Hanna and Kangolle, 2010).

These needs do not, however, remain static. As societies progress along the development curve, it may be expected that new and different types of care will be demanded, for example in ageing populations, as life expectancy improves. At the same time, developing countries must continue to include prevention along with the treatment of chronic diseases (Hanna and Kangolle, 2010). Cost effective disease control interventions are also necessary, as they have proven to eradicate diseases while alleviating burdens on the health care sector (Mamlin et al., 2006). This suggests that finite resources may need to be allocated according to changing priorities, balancing the need for preventative, curative and chronic care, while meeting continually increasing demands. Developing countries therefore need to learn and adapt, and the experience of more developed health systems may well be invaluable.

Whatever the economic setting, the general global consensus is that the role of primary care is invaluable in reducing health inequality. Problems such as delayed emergency care, inadequate training, and lack of guidelines are "correctable" (Nolan et al., 2001). In an analysis of preventable deaths in children in 41 countries, it was determined that 63% of deaths may have been avoided if primary care was fully implemented (Starfield et al., 2005). It is therefore not only possible for primary care to make a key contribution to equality; it is also highly desirable.

Need for Quality of Care Improvement

Health care has become increasingly expensive due to the advancements in new medical technologies, aging populations, primary care workforce shortages, and increased incomes for health workers (New England Healthcare Institute, 2009; Jenkner and Leive, 2010). Against this backdrop of rising cost pressures, many countries are under great pressure to reform their health systems, as illustrated in the United States health care reform legislation in 2010, even as care facilities often perform below adequate measures of quality (Davis et al., 2010).

Quality improvement measures are deemed necessary to strengthen both health care facilities and health care systems, while containing costs. Health systems may see improvements in health outcomes at minimal cost, if attention is "focused" on implementing effective and inexpensive interventions (Jamison, 2006). Increasing the quality of primary care has a positive impact on the cost, consumption and satisfaction rating of health care. Health care consumption and costs will decrease, while patient satisfaction and the contribution to overall health systems will increase (Engstrom et al., 2001). Reduced costs are

attributed to improved preventative care and a reduced number of hospitalizations (Starfield et al., 2005). Overall, equity goals are also made more achievable, as primary care is associated with a fair and even distribution of care (Starfield et al., 2005).

Literature from the developing world echoes the need for quality improvement measures. Health care systems in developing countries were traditionally designed to manage primarily infectious diseases, as well as child health and maternal health (Hanna and Kangolle, 2010). Developing countries are now expected to include prevention and treatment of chronic diseases (Hanna and Kangolle, 2010). These increased expectations place pressure on systems that are already deficient in capabilities, as evidenced by many examples. A study of paediatric care in Papua New Guinea revealed that almost 70% of health care workers checked for only half of the pneumonia examination criteria, with less than a quarter of the workers knowing which malaria treatment to prescribe (Peabody et al, 2006). A study conducted in Pakistan revealed similarly poor results for the diagnosis and treatment of viral diarrhoea (Peabody et al, 2006). A study in Indonesia found that 60% of all peri-natal deaths were due to poor health care processes, compared to less than 40% of deaths attributed to financial limitations (Peabody et al, 2006). Targeted quality improvement interventions have the potential to address these shortcomings, and to equip systems to face continuously evolving needs.

Because resources are limited, quality improvement is only beneficial if it focuses on the biggest offenders of quality lapses. Quality improvements should be targeted where they can make proportionally the most impact (Woolf, 2004). If poor control of blood pressure accounts for a greater number of deaths than illegible drug prescriptions, a quality improvement brought about by the computerized transcribing of prescriptions might not be the best option. Woolf (2004) acknowledges, however, that some quality improvements may potentially have multiple benefits.

Quality improvement interventions could also assist with maximizing use of these constrained resources. The World Health Organization (2010a) estimates that between 20% and 40% of all health resources are wasted universally. The absence of quality of care can be divided into three main categories: misuse, overuse and underuse of care (Berwick, 2002). Misuse pertains to the failure to execute clinical care properly; overuse pertains to the use of resources and procedures in the absence of evidence of benefit; and underuse pertains to the failure to employ practices of proven benefit (Berwick, 2002). Quality of care aims to reduce or eliminate misuse, overuse, and underuse of care in order to have the best possible care available for patients. The need for action in this regard has not gone unnoticed; quality became a notable issue for health care providers following the release of a number of papers addressing the need for better quality control in the United States.

Quality of Care

Much has been written that is relevant to defining quality of care. In the early 1900s in the USA, Dr. Ernest Amory Codman, a physician at the Massachusetts General Hospital, was amongst the first to acknowledge the concept of quality in health care (Madhok, 2002). Quality, without the health care context, is broadly outlined as superiority or degree of excellence. Within the health care context, quality is a relative term. The notion of quality in health care is complex to define. Quality is both an objective and subjective experience, regardless of the point of view from which it is sought (Hudelson et al., 2007). The oft-cited Lee and Jones (1933) notion states that quality is value judgment in good faith. Thus, the definition of quality is highly subjective and may conform to one's wishes – although it usually conforms to values of the respective health system. This notion of quality is echoed in the literature (Bruce, 1990) but has different connotations, depending on where and how it is used.

Campbell et al. (2000) define quality of care for both individuals and populations. For individuals, quality of care is "whether individuals can access the health structures and processes of care which they need and whether the care received is effective (Campbell et al., 2000, p.1614). The individual definition focuses on care provided by a health care professional, assessing access and effectiveness. For populations, quality of care is "the ability to access effective care on an efficient and equitable basis for the optimisation of health benefit/well-being for the whole population (Campbell et al., 2000, p.1617)." The population definition uses a societal perspective which assesses opportunity costs. Quality of care is an important health systems issues.

The US Institute of Medicine has assembled a quality assurance committee and has published several reports on quality in health care. While these reports focus largely on the health system in the United States, the discussions are relevant on a global scale. The Institute of Medicine (2001) defines quality as "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge (p.3)."

The Institute of Medicine (2001) divides quality into six broad categories in which care can be assessed. The categories are: safety, meaning that patients should be as safe in health care facilities as they would be in their own homes; effectiveness, in which the health care system should use evidence-based care avoiding the misuse, overuse and underuse of effective care; patient-centred, in which care should respect the patient as an individual; timeliness, in which care should be delivered within an acceptable period; efficiency, in which waste of resources should be reduced; and equity, in which the system aims to close demographic gaps in health status (Institute of Medicine, 2001). The Commonwealth Fund has a similar structure for defining quality of care, which generally refers to care which is effective, safe, coordinated and patient-centred

(Commonwealth Fund, 2010). Decker (1992) has mused that quality of care rarely includes patient satisfaction, or patient and health provider needs.

Newman et al. (1996) assert that quality of care is two-fold, consisting of hard technical elements and soft elements. Hard technical elements include correct diagnoses, suitable interventions and effective treatments, whereas soft elements include communication, patient satisfaction and consideration for patient preferences (Newman et al., 1996). This is not dissimilar from the notions of technical tasks and doctor-patient interpersonal exchange, as outlined by Donabedian (1980). The structural features of a health system have a direct impact on processes and outcomes. If the required technical elements are not available, it limits a patient's ability to access care (Campbell et al., 2000). The linkages between healthcare systems issues and quality of care cannot be considered in terms of simple cause and effect; while the presence of underpinning systems makes the delivery of quality care arguably more achievable, it is not a pre-requisite for, or a guarantee of, quality care. Other systematic reviews of quality improvement initiatives have concluded that "whilst systems and processes increase or decrease the likelihood of individuals receiving the care they need, they do not guarantee quality care (Campbell et al., 2000)." Quality improvements targeting hard elements are generally easier to assess, due to outcomes. Quality improvements targeting soft elements have to rely on indicators. Outcomes may exist, but not as markedly as they do for technical elements.

Crossing the Quality Chasm

The Committee on Quality of Health Care in America was formed by the Institute of Medicine in 1996 to increase efforts to improve the quality of care. The committee published a series of papers detailing the need for quality improvements in primary care, in the United States, in order to close the gap between clinical experience and practice. *Crossing the Quality Chasm: A New Health System for the 21st Century* was the second paper in the series. Published in March 2001, it served as a follow up to *To Err is Human*, a 1999 report which detailed the high number of medical errors in the United States.

To Err is Human: Building a Safer Health System was the first paper in a series dedicated to quality in health care. Published in 1999, the report stated that between 44,000 and 98,000 lives are lost each year in the United States, through preventable medical errors (Institute of Medicine, 1999). The report stressed that medical errors cause excessive harm; errors tend to result from systems failures; reporting programs are necessary; and a collaborative national effort is required to improve patient safety (Richardson et al., 2000).

The figures used in the *To Err is Human* report have been fervently contested (McDonald et al, 2000; Sox and Woolish, 2000). McDonald et al. (2000) rebut the IOM report, claiming that the figures are erroneous. They further assert that 'excess mortality' was calculated, and that the figures are inflated. McDonald et

al. (2000) assert that the studies generating the interval death count were never intended to study causality, and include patients who were already dying, inflating the overall death count. Leape (2000), a further author of the original 1991 paper on the Harvard Medical Practice Study, asserts that the IOM's numbers are correct. Leape (2000) acknowledges that one weakness of a retrospective study is attributing causation to an action when the known outcome is of a negative nature. Leape (2000) and Richardson et al. (2000) may be considered to be correct, in that the overall conclusions of the study are justified, even if disagreement exists about the figures themselves.

Both papers brought attention to the issue of patient safety, causing it to become a priority concern amongst health professionals and policy makers.

Crossing the Quality Chasm serves as a basis for drawing conclusions in principle, which may point to quality improvement needs to be considered in other countries. The report outlines six elements of quality, which have been adopted by the World Health Organization (and others) in a number of their report focusing on quality, in both high-income and low and middle-income country arenas (Elovainio, 2010; World Health Organization, 2010b). The report's identification of contextual elements has been beneficial in understanding how changes to process can improve care (Peabody et al., 2006).

The Growing Emphasis on Quality of Care

Across settings, quality of care has emerged as an increasingly important issue, as other health care concerns have become progressively less pressing. Access to care, for example, is no longer regarded as a burning issue – even for some populations in developing countries (Das et al., 2008). Recent studies indicate that some individuals in developing countries possess similar access to health care as their counterparts in the United States. In India, individuals visited physicians five or six times annually, as opposed to the United States where individuals only visited physicians an average of three times (Das et al., 2008). This increase in interactions with physicians may not be an indicator of greater access; but instead be an indication of poor quality of care, as health problems may not have been adequately addressed in initial visits.

With concerns about access declining, attention has shifted to quality and its attendant issues, such as the key components of quality. As an example, quality of care became an interest in India after the rise of formal private health markets (Sheikh et al., 2011). One dimension of quality in health care in low and middle-income countries is "structural quality." Structural quality can be defined as "a key element in the quality of care provided at the primary level, which aims to offer health care interventions of proven efficacy (Gilson et al., 1995, p.105)." Structural quality can be measured in terms of physical infrastructure and availability of certain medicines (Das et al., 2008). The emphasis on structure is important, as failures in structural quality have the ability to undermine advances in process quality. Process quality refers to how a medical practitioner appropriately applies his/her clinical expertise and resources to improve a

patient's health (Barber and Gertler, 2002). Studies investigating quality of primary care in low and middle-income countries have noted poor diagnostics, treatment, and patient monitoring (Nolan, 2001). In another example, a Tanzanian-based study found that a lack of equipment and supplies hindered health workers from performing their tasks (Gilson et al., 2005). These deficiencies are caused by a lack of infrastructure as well as outdated equipment and technology (Sheikh et al., 2011). While the deficiencies are understood, the conditions necessary to address these may not exist. Quality of care cannot be improved in an environment that does not promote procedural transparency or accountability (Sheikh et al., 2011). A culture promoting best practice, underpinned by supporting structures, is thus needed before quality of care can be improved in a sustainable fashion.

The systemic requirements for success are well documented. Quality in primary care is achieved by conforming to performance standards which promote safe and affordable practices that produce outcomes (Gilson et al., 1995). Performance standard minimize the opportunities for breakdowns of the system. Gilson et al. (1995) note that system failures are a precursor to poor quality care. Structural factors at the primary care level, such as physical infrastructure and health system organization, are "critical influences" of quality (Gilson et al., 1995). Thus, smoothly operating health systems, with the appropriate emphasis on standards, structure and infrastructure, are likely to produce care of a higher quality.

Various studies from low and middle-income countries report similar findings about quality. Piecing together success stories from countries within Africa, Asia, and parts of the Middle East have demonstrated that primary care is associated with better health outcomes (Gilson et al., 2007). It has been noted that low-income countries may benefit from partnering with non-state providers in order to increase quality of care (Gilson et al., 2007). These successful partnerships exist, however, in an approach focused on universal coverage, and incorporate strong monitoring and evaluation systems (Gilson, et al., 2007).

The economic benefits of quality of care are potentially far reaching. Benefits can be seen both on individual and societal levels (Peabody et al., 2006). With quality emerging as the next important issue, there is a natural concern with measuring quality of care.

Measuring Quality of Care

Quality can be measured from three distinct perspectives: client, professional, and management (Ovretveit, 1991). The overall understanding of quality of care differs within each domain. Starfield (1994), along with others (Campbell et al., 2000; Hogg et al., 2007), stresses the differences between individual and population perceptions of quality. Individuals assess quality based on access and effectiveness of clinical and interpersonal care, whereas populations instead assess quality on equity and overall efficiency (Hogg et al., 2007). Overall, quality is matter of value, where material inputs and practitioner skills are optimized to

produce the best possible care (Peabody et al., 2006). Individual patients or clients then benefit from reduced morbidity and delayed mortality (Nolan et al., 2001).

Quality, from a client's perspective, addresses what the patient desires from a service. Donabedian (1980) states that patient satisfaction is central to the idea of quality of care. This is echoed by the Institute of Medicine, through the inclusion of "patient-centeredness" as an aspect of quality. A patient's satisfaction with care is determined by the responsiveness to their needs (McGlynn, 1997). As McGlyyn points out, patients have been led to believe that surgery and modern medicine can cure all ills, prompting patients to have high expectations. Morgan and Murgatroyd (1994) propose that client and professional perspectives are one and the same, as health workers are invested in their patients. Steffan (1988) similarly believes that the delivery of high-quality care translates into a patient and doctor's joint satisfaction. However, Newman et al. (1996) discovered that patient satisfaction is not important for doctors in training, with junior doctors believing that patient satisfaction is only a concern as it is the evident result of high quality care outcomes.

Quality, from a health care professional perspective, involves the execution of the correct clinical procedures. A health care professional's delivery of quality care requires knowledge and skills, personal motivation, and collaboration (Hudelson et al., 2007). There is, however, variation within health workers' beliefs. Practitioners define quality as technical competency, the result of thorough training and supervision (Hudelson et al., 2007). Nurses believe in communication, collaboration, and ultimately consensus on a patient's care, when delivering quality care (Hudelson et al., 2007). Ultimately, quality of care is delivered at the discretion of the health care professional. It is an individual effort, aided by implemented system measures. Hudelson et al. (2007) believes that health care professionals are guided by a professional ethos, which wills practitioners to provide the best possible care. McGlynn (1997) recognizes these various, somewhat competing, influences by regarding a professional's approach as involving cost containment, execution of technical procedures, and addressing a patient's individual needs.

Quality, from a management perspective, demands efficient use of resources within health system constraints (Hudelson et al., 2007). It is the least discussed of the three domains or viewpoints. Other approaches and perspectives, such as McGlynn's (1997), assess purchasers in place of management. Purchasers are almost entirely focused on cost, and quality is directly linked to efficiency. From a different perspective, higher quality of care results in enhanced clinical performance, better health outcomes, decreased health expenditure, and increased patient satisfaction (Nolan et al, 2001; Jamison, 2006). Issues of effectiveness, acceptability, accessibility, equity, and relevance in care must also be considered (Maxwell, 1984). Newman et al. (1996) use these elements to provide a basic checklist from which service may be critiqued.

Thus, these three different stakeholder groups may have widely divergent quality priorities.

The seminal paper on quality of health care was written by Donabedian (1966), in which he discusses the foundational aspects of quality, namely structure, process and outcome of an intervention. Structure includes inputs and resources such as infrastructure, people, supplies and information. Process is a sequence of steps or activities. Outcomes are results such as the delivery of care, and changes in health behaviour or in status. It is Donabedian's paper, and this concept, which forms the foundation for many health outcome measurements.

A wide variety of quality metrics exists, and quality can be assessed through a multitude of methods, such as audits, electronic data, satisfaction surveys and performance measures. Such measures could assess the structure, process, and outcome of an intervention (Donabedian, 1980). There is increasingly a focus on assessing process, in addition to the stress on outcome management (McGlynn, 1997; Lohr, 1997). Structure includes staff, equipment and appointment systems (Campbell et al., 2003). Measures of structure tend to be the easiest to obtain (Peabody et a., 2006). As such, structural measures of quality are most commonly used in developing countries. Structural improvements in quality are often not enough to improve health outcomes, but are rather used as approximations for process and outcomes (Peabody et al., 2006). Process includes prescribing, investigations and patient interactions (Campbell et al., 2003). Process is difficult to measure in developing countries, due to the lack of measurement criteria and tools (Peabody et al., 2006). Measureable outcomes include mortality, morbidity or patient satisfaction (Campbell et al., 2003).

Some believe that outcomes are not an effective measure of quality. A patient could receive poor quality care and still recover fully or, on the other hand, a patient could receive high quality care and receive no health benefit (Peabody et al., 2006). To ensure consistency, all measurements must be based on data, which can be time consuming and costly (Coutts, 2010).

Quality measurements are not ends in themselves, but form inputs into quality improvement initiatives. Assessment of quality is, in fact, essential to quality improvements (Campbell et al., 2003). Whatever the chosen measure, the metric obtained must be compared to desired standards; therefore quality improvement interventions require both goals and measures (Coutts, 2010).

Quality Improvements

Quality improvement may rely on simple measures (such as continuing education, feedback, meetings, leadership and delegation) as well as more complex measures (such as computer use) and multifaceted interventions (Grol, 2001). In addition, accepted and established quality improvement processes from other sectors have penetrated health care over time. These include the United Kingdom's Quality and Outcomes Framework, born from corporate management practices, and Lean and Six Sigma methodologies, which stem from business and manufacturing.

In addition to other benefits, quality assessment at the system level may serve to ease physician fears of culpability and liability, which act as an impediment to improvement. Physicians are reluctant to accept blame for erroneous procedures (Kane and Mosser, 2006), although gaps in treatment quality do undeniably exist. Quality improvements attempt to close the gap between clinical research and practice (Shojania and Grimshaw, 2005). What is expected in theory may not always be observed in practice, as examples show. A study in the Philippines found that health worker supervisors assumed that health workers were delivering a certain level of care. Upon inspection, it was determined that health workers were only delivering a fraction of the intended care, meaning the patient was not receiving the full range of personal services he or she required. Without assessment, such discrepancies would escape detection.

The Institute of Medicine (2001) recommends that quality improvements be "knowledge-based," "patient-centred" and "systems-minded". For quality improvement to be effective, it should be comprehensive and continuous. This is reflected in the names of several approaches to quality, such as Total Quality Management (TQM) and Continuous Quality Improvement (CQI), which are detailed in another section of this review.

Arguably, the most challenging improvements are system based. Physicians work within constraints imposed by the system (Decker, 1992), which is also the case with developing countries. The Quality Assurance Project, which aims to develop and implement quality improvements in LMICS, argues that systems have to be address to effect change; as an example, it observes that improvements to care occur not because a new diagnosis machine is installed, but because staff members are also trained to use the machine. Change to *existing* elements has to occur alongside *additions*. This notion implies that quality improvements can occur with minimal resources, and do not necessarily have to constitute a financial burden.

More developed, affluent societies tend to have fewer institutional or system-based issues. Instead, the deficiencies exist at the personal level. One physician was quoted as saying that quality improvement was initiated because "of things being too busy and too chaotic… I had to use my time better and learn to work smarter (Coutts, 2010, p.23). This observation of personal ineffectiveness is

somewhat borne out by other studies, although systemic challenges are also cited. Hudelson et al. (2007) identified that the clinical hierarchy, time pressures and system constraints are barriers to providing care. Newman et al. (1996) noted high workload, lack of resources, pressure to perform quickly, as well as poor clinical and managerial organization, as further obstacles. Both of these conclusions are largely system based. Performance is the outcome of the system, and for performance to improve, changes must occur in the overall system. For performance of physicians to improve, they must be incorporated into the larger system, and given a sense of responsibility and ownership (Decker, 1992).

While the majority of the quality improvements are aimed at the systems level, Li (2006) asks the following question: "Can health care really ever be high quality if the patient-physician interaction is hurried, disrespectful, cold, callous, and uncaring? (p.295)" Li affirms that quality of care and quality of caring are indivisible. Kane and Mosser (2006) also stress the role of the physician, encouraging physicians to act more systematically. This does not ignore the idiosyncrasies of individual patients and particular situations, but instead lauds the use of reminders and alerts, as a systemic way to improve care.

Quality Improvements in a Low-Income Context

While many interventions for improving care quality have been identified, many countries lack the economic resources to implement them. Hudelson et al. (2007) posited that additional staff, hierarchical support and ongoing evaluation are basic strategies which can improve care. Unfortunately, the introduction of additional staff or health workers is not always possible, especially is the developing world. Furthermore, introducing measures which may improve health outcomes – at even the most modest costs – may not be possible either. In such cases, existing resources need to be "optimally managed" (Hanna and Kangolle, 2010). Affording practitioners the space and time to reflect on issues, and for understanding areas of possible improvement, will vastly improve care.

In keeping with the constitution of the World Health Organization (1997), Bruce (1990) asserts that improvements in quality of care are crucial for the advancement of human rights; in fact, targeted quality improvements at the primary care level are essential to reduce mortality and morbidity (Nolan et al., 2001). This is especially true in less-developed countries, with a shortage of health care workers (Hanna and Kangolle, 2010). Yet, these are the very counties that may be least equipped to implement vital improvements.

Even where resources are relatively abundant, deficiencies in care exist. Studies from high-income countries such as Canada and Germany reveal that a large number of patients report deficiencies in care for chronic conditions (World Health Organization, 2008). Similar data have been reported in low-income countries like Ethiopia and Pakistan (World Health Organization, 2008). The

presence or absence of resources is therefore not the only determinant in a country's ability to effect improvements.

The lack of resources is often seen as one of the critical quality issues for low and middle-income countries, but quality can actually be improved within resource constraints. Peabody et al. assert that care of high quality can be provided even in resources constrained systems (Peabody et al., 2006). Nabyonga-Orem et al. (2008) also concluded that quality improvements were possible within financially strained contexts. It may be expected that low and middle income countries face different challenges to those of high income countries in the quest to provide quality care, as they have fewer resources than high income countries. Financial resources are needed to provide the facilities and tools required to render quality care (Rowe et. al, 2005). A further, particular constraint faced by the former is the shortage of human resources, as emphasised by a study of HIV care in Zambia, which has been proposed as a model for low income countries seeking to improve the quality of care (Morris and Quiterio, 2009). While an abundance of resources clearly does not guarantee quality of care, the shortage of resources must be considered a factor in the type and extent of quality improvements that can be achieved.

In reviewing the available literature, it becomes apparent that the range of quality improvement interventions employed in low- and middle-income countries differ significantly from those typically implemented in high-income countries. In low income countries, interventions tend to be focused at the systemic level (as opposed to addressing personnel proficiency or productivity), with examples ranging from technology improvements, such as implementing electronic patient records, to improvements in collaboration (Mamlin et al., 2006; Peabody et al., 2006). An example is the implementation of electronic health records in resource-constrained settings, such as India (Were et al., 2010). An open-source version, OpenMRS, had been implemented in a number of African countries (Mamlin et al., 2006). Resulting analysis determined, however, that there was a shortage of skilled staff to maintain the desired level of care. Quality therefore suffered not as a direct result of limited resources, but due to an absence of supporting infrastructure. Quality interventions will be necessary in streamlining inefficient processes and standards of care, so that these developing countries can deal with a new set of problems. It may be that high-income countries have already had the opportunity to apply time and financial resources to basic systemic improvements, while low and middle-income countries have yet to do so, on an effective scale. It may be possible for these countries to learn from the experience of those who have already succeeded in implementing systemic improvements.

Quality Improvement Approaches

There are several well-documented approaches to improving quality, all of which have been applied in both high-income and low and middle income settings. The most commonly used approaches are Quality Assurance, Continuous Quality

Improvement, Lean and Six Sigma, Total Quality Management, and clinical governance. The strategies are often combined in practice.

Quality Assurance is a systematic method which communicates the importance of excellence to individuals and their teams, while providing the necessary tools to continuously improve performance levels (Brown et al., 1998). It is a ten step cyclical and iterative process which can be executed in a number of ways, depending on the context (Brown et al., 1998). Quality Assurance is an appropriate approach for developing countries due to its simplicity and flexibility. Quality Assurance focuses on process, as recommended by the World Alliance for Patient Safety, which advocates for interventions targeted at a system level (World Health Organization, 2008). Emphasis on organizational culture minimizes the alienation of health care workers. Quality Assurance empowers teams, advocating for greater participation of communities (Reerink and Sauerborn, 1996). Quality Assurance uses data that can be easily obtained from small scale studies. And finally, Quality Assurance has a problem-solving focus that produces short-term results (Reerink and Sauerborn, 1996), thus encouraging adoption.

Continuous Quality Improvement, another process focused strategy, stresses that an opportunity for improvement is always present (Reerink and Sauerborn, 1996). Continuous Quality Improvement is the constant and repeated improvement pattern of improvement. It requires dedication and the obligation to improve all aspects of operations, on a consistent base (Reerink and Sauerborn, 1996).

Lean and Six Sigma are two further methods that are often combined. Born out of manufacturing, the two approaches both focus on process. Lean originated from the Toyota Production System, with the goal of streamlining process inefficiencies (Varkey et al., 2007). Lean, as adapted to a healthcare system, focuses on the needs of the patient, removing non-value-added or wasteful activities, and ultimately improving the flow of care. Waste pertains to over-production or under-production, wasted inventory, rework or rejects wasted, waiting waste, processing waste, and transport waste (Varkey et al., 2007). Six Sigma also emphasizes removing inefficiencies, but with the added goal of reducing cost and process variation. Six Sigma grew out of Motorola's desire to reduce defects that arose due to the variation of processes. Six Sigma ultimately involves defining, measuring, analyzing, improving, and controlling (Varkey et al., 2007). Six Sigma is an update of an older approach known as Total Quality Management. Total Quality Management is a cultural, collaborative initiative that focuses on incremental quality improvements (Black and Revere, 2006). Unlike Six Sigma, Total Quality Management conforms quality improvements to existing processes within an organization; this implies that improvements are limited to process refinement, and stop short of process redesign. The focus is therefore on the adherence to standards, without necessarily raising or redefining the standards themselves.

Clinical governance is an approach to quality improvement adopted by the United Kingdom's National Health Service. Clinical governance recognises high standards of care with transparent responsibility and accountability, in a climate of constant improvement. Clinical governance calls for an environment in which health workers, supported by strong leadership, can learn to facilitate the delivery of quality care (Halligan and Donaldson, 2001). Clinical governance aims to bridge the gap between management and the delivery of care (Halligan and Donaldson, 2001).

The various approaches to quality improvement reveal that there are multiple strategies available to improve care, and that they range from comprehensive, standards-based frameworks to ad hoc, targeted interventions. Interventions in quality of care can range from provider or patient reminders, provider or patient education, medication management, care coordination, audit and feedback, team or personnel changes, organizational change, medical records system changes, promotion of self-management, disease or case management, and financial incentives (Chao, 2007). These strategies have largely enjoyed positive implementations and impact. Certain strategies, such as organizational change and patient education, tend to display more impact than others (Chao, 2007).

In Summary

Broad consensus exists on the definition of Primary Care, and of the Primary Health Care context in which it exists, although the definitions differ in phrasing. While primary care arrangements differ from one country setting to another, the literature shows common elements which can be found almost everywhere: primary care serving as an entry point to other systems, a community emphasis, and a generally positive impact on overall health care provision. Regardless of setting, a universal need for quality improvement, often due to rising cost pressures, is noted in the available literature. The growing emphasis on quality of care has necessitated the need for quality measurement, which in turn has enabled both simple and complex quality improvement efforts, sometimes using approaches borrowed from industry or manufacturing. The reviewed literature chronicles such quality improvement efforts in primary care, and depicts interventions aimed at structure, processes and outcomes. The interventions recorded in the reviewed literature are shown to meet with varying degrees of success. This may be due, in part, to the fact that the interventions at are shown to be subject to external influences, which serve to either enable or constrain the attainment of improvement objectives. Again, these influences differ across country settings, but are found to emanate from similar sources within the various systems, namely patients, professionals, management, and the systems themselves. Taken collectively, the literature contained valuable, and arguably broadly applicable, field experience which could be applied to the benefit of comparable situations elsewhere.

Systematic Review as an Approach of Secondary Research

Introduction

The study will involve a systematic review of qualitative research. Systematic reviews are methodically executed literature reviews that summarise the existing research evidence (Hemingway and Brereton, 2009). Due to time and financial constraints in health care, systematic reviews are considered an efficient scientific technique. Reviews can be less time consuming and less costly than initiating a new study. Reviews provide an 'interpretive context' that cannot be found in a single study (Chalmers and Altman, 1995). The studies' respective investigators have each assessed their included article. A review amasses these articles for review by an investigator or panel of investigators who analyse and interpret each article according to set criteria. Each article is independently assessed, but is also evaluated in relation to the other articles. The gold standard in research is randomized control trials, surpassed only by systematic reviews of randomized control trials. As a single clinical trial cannot provide an accepted answer about an intervention or treatment, systematic reviews compile several trials so that an accepted answer can be formulated (Cook et al., 1997). Systematic reviews also allow an understanding of trial particulars and peculiarities that cannot be inferred from a single trial. Systematic reviews allow judgments to be made about consistency (Cook et al., 1994).

Ultimately, updated reviews can lead to quicker implementation of diagnostic or treatment tools (Chalmers and Altman, 1995). Health professionals and policy makers can use systematic reviews to guide decision-making, rather than be overwhelmed with unnecessarily detailed information. Systematic reviews synthesise and refine mass amounts of literature, allowing for a brief overview and critical evaluation of relevant studies.

Systematic reviews of health care issues typically include random control trials and other quantitative research methods (Dixon-Woods and Fitzpatrick, 2001). Systematic reviews aim to answer a specific question of a particular clinical intervention. The question includes a target population and setting; a condition or disease of interest; an exposure to an intervention, test or treatment; and at least one specific outcome (Cook et al., 1997). Reviews typically intend to reach consensus on economic evaluations, derived treatment or intervention value and expected outcomes (Cook et al., 1997). Reviews, then, tend to evaluate impact.

The Case for Systematic Reviews of Qualitative Research

Systematic reviews involving quantitative research do not provide information on decision-making factors, motivations or experiences (Dixon-Woods and Fitzpatrick, 2001). Qualitative data are more detailed in meaning and context

(Popay et al., 1998). Qualitative research tends to provide a deeper, richer insight into context than most random controlled trials (Popay et al., 1998).

Recently, reviews including qualitative and mixed-method research have emerged. This emergence broadens both the reach and use of reviews. Although the use of qualitative research in systematic reviews is still evolving, its application is steadily improving. The surge of qualitative studies in healthcare also requires a new form of synthesis (Dixon-Woods and Fitzpatrick, 2001). Several frameworks have emerged for use of qualitative research in a systematic review.

Randomised Control Trials are no longer essential when amalgamating studies (Dixon-Woods and Fitzpatrick, 2001). While trials were once the preferred or only accepted scientific research method in the health world, other forms of research, including qualitative research, are now more widely accepted. Fairhurst and Huby (1998; as cited in Dixon-Woods and Fitzpatrick, 2001) make the case that doctors use trial results for practical knowledge improvement, not because of their academic rigour, but because of the trial environment. The trial environment is the closest proxy for real life experience. Qualitative data is more detailed in meaning and context (Popay et al., 1998). Qualitative research tends to provide a deeper, richer insight into context than most random controlled trials, and is particularly advantageous when investigating motivations, experiences and decision-making (Popay et al., 1998). The systematic review of qualitative research allows for a critical overview that is beneficial to health professionals and policy makers alike.

This review follows the methodological steps derived from Thomas and Harden (2008), who have developed an easy to understand approach to the synthesis of findings of qualitative research that is appropriate for use in public health. Thematic synthesis is acknowledged as a clear approach, in an otherwise murky field of qualitative methods, for inexperienced analysts to use (Howitt and Cramer, 2010). Methodological steps include searching using specific keyword terms; assessing the quality of results using specified criteria; data extraction using specified criteria; translating concepts/synthesis by way of coding, developing descriptive themes, developing analytical themes, analysis and discussion of results (Thomas and Harden, 2008). Measures such as checklists and extraction sheets will be implemented to control quality, and are appended. All attempts will be made to develop a transparent process.

Methodology of Systematic Review of Qualitative Literature

A number of issues may be anticipated with systematic reviews of qualitative literature, particularly regarding methodology. Methods are frequently not documented in sufficient detail, discouraging replication and appraisal. For a systematic review to uphold quality, its methods must be explained in detail to allow for duplication (Oliver, 2011).

Searching and compiling literature can be cumbersome, and therefore the process should be recorded meticulously. Articles' inclusion is based on relevance set by inclusion criteria. Articles that do not meet the criteria should be excluded from the review. Selection criteria should be well defined but allow for flexibility. The search process will be recorded.

Literature should be further inspected for relevancy of content as articles may have incorrectly or misleadingly labelled keywords. Article abstracts, and articles as needed, should be read to confirm appropriateness of inclusion. Further inspection of articles will ensure that only appropriate literature will be included in the review.

Critical Appraisal

The value of qualitative research is no longer contested, but doubts still exist about academic rigor (Barbour, 2000). Without rigor, Morse (2002) contests that qualitative (and quantitative) research are both worthless and useless, and it is necessary to confirm both validity and reliability.

Campbell et al. (2003) stress that it is possible to assess research quality without quantitative measures. Instead, qualitative measures such as peer review or interviews can be utilized. Several different evaluative methods such as criteria and checklists are available to assess the standard of qualitative research (Stige et al., 2009). However, some believe that checklists should be used to critically evaluate, not inform, research. Stige et al. (2009) and Barbour (2000) stress that checklists, while useful, can often be "prescriptive." The use of checklists can exclude competing paradigms and may ignore the richness of differing values and perspectives (Stige et al., 2009). Barbour (2000) insists that checklists are akin to "wagging the dog", in which they serve to lead, not guide.

The literature recommends assessment using the appended Critical Appraisal Tool, produced by the Critical Appraisals Skills Programmes, and developed by Oxford University Public Health Resources Unit (Milton Keynes Primary Care Trust, 2002). The Critical Appraisal Tool (Appendix 1) may be used to guide judgment on article inclusion. The tool includes basic questions with detailed prompts that will aid in determining an article's quality. Articles should be systematically assessed according to their research design, sampling strategy, data collection, reflexivity, ethics, analysis, findings, value of research, and persuasion of argument. The Critical Appraisal Tool does not provide definitive answers, but may be used to guide critical thinking about an article. Articles may be reassessed according to other articles. All assessment activity should be logged in order to track the principle investigator's judgment

It is recommended that articles' summaries should be used to systematically extract pertinent information and summarize data from articles (Thistoll, 2011). Structured, concise summaries allow for easy retrieval of pertinent study information and ensure that during coding and development of themes, the specifics of each study are not ignored.

Data Collection

Data are generally extracted from an article's findings section, although there is no uniform method of reporting a study's findings. Some text, such as direct quotes, is more easily identified than others, such as finding summaries (Thomas and Harden, 2008). This conundrum is termed "signal-to-noise" (Booth, 2001). The "signal" is the primary verbatim data, whereas the "noise" is the author's interpretation of that data (Booth, 2001). This delineation can also be differentiated as "data" and "findings". "Data" pertains to direct quotes from study participants whereas "findings" pertains to a researcher's treatment of these quotes (Sandelowski and Barroso, 2003). It is understood that that data presented in its "raw" form have sufficient meaning, without a researcher interpreting further meaning (Sandelowski and Barroso, 2003). The author includes only the most relevant data, although that may only be data the author judges to be relevant. Therefore all text located in sections labelled 'results' or 'findings' in articles can be considered as study findings (Thomas and Harden, 2008). In some cases, results sections are used only to report basis findings, and findings are discussed within the 'discussion' component of an article. As such, all text located in sections labelled 'discussion' can be considered as study findings. This should be judged on a per paper basis. Authorial interpretation and judgment should be noted.

Each article will offer data that can be used in a "non-numerical synthesis" (Dixon-Woods and Fitzpatrick, 2001) of relevant research on quality improvement interventions in primary care. This text will be isolated and synthesized. It should be noted, however, that qualitative synthesis techniques are 'underdeveloped' (Dixon-Woods and Fitzpatrick, 2001). Distinction will be made between the authorial intent or interpretation of data, and the actual reported data themselves. Extracted text and article summaries will be read closely. Detailed reading will allow for familiarity with content and for gaining an overview of potential themes (Thomas, 2003).

Data Analysis

Data can be analysed using thematic analysis, an analytical process for encoding qualitative information. More specifically, thematic analysis is a qualitative method used in "…identifying, analysing and reporting patterns (themes) within data. It minimally organises and describes your data set in (rich) detail. However, frequently it goes further than this, and interprets various aspects of the research topic (Braun and Clarke, 2006 p.79)." Thematic analysis is widely used across disciplines, often using the process as outlined by Thomas and Harden (Boyatzis, 1998).

Analysis is recommended to occur in three stages: line-by-line coding, creation of descriptive themes and creation of analytical themes. The coding process (generating descriptive themes) will largely be an inductive process, with codes and themes emerging from the text (Thomas, 2003). This allows meaning to be

attributed to experiences and knowledge that emerge from the text (Sandelowski et al., 1992). The third stage, analytical coding, is the most crucial as it determines the resulting analytical discussion. Themes identified in analytical coding have greater relevance to the research question than to the original study text (Thomas and Harden, 2003). The descriptive themes that emerge from informant's stories and authorial judgment can be woven together to suggest a collective experience (Aronson, 1994). Synthesis involves interpretation of the data, the article and the amalgamation of articles. This undertaking of continuous synthesis extracts meaning, which is removed from the original intent of the data (Thomas and Harden, 2003). This potentially allows for a greater understanding than could be provided in an empirical study.

In some cases, literature and theory may suggest appropriate codes which may be used to guide analytic coding. For example, the wider literature on quality improvement interventions discussed earlier provides ideas about issues that can be examined in systematic reviews of these interventions. Specific issues, that can be considered in coding include, but are not limited to, the following widely cited perspectives:

- Stakeholder perspectives, such as patient/client, professional/health worker and provider/management (Ovretveit, 1998). The stakeholder perspectives have been used alone or in modified in further frameworks (Pieper et al., 2008).
- Type of quality improvement, such as process, structure and outcome (Donabedian, 1980). Donabedian's framework has been adopted by the World Health Organization and has been used in both high and low and middle-income settings (McGlynn, 1997; Lohr, 1997; Campbell et al., 2003; Peabody et a., 2006).
- Aspects of quality, such as safety, effectiveness, patient-centeredness, efficiency, equity, and timeliness (Institute of Medicine, 2001). The IOM's quality attributes have been well adopted, mostly for use in high-income settings (Hogg et al., 2007). These six attributes have become the accepted basis for quality, becoming the basis by which other frameworks become an extension (Mendoza et al., 2011).

Overall Conclusion

Quality of care is a critical component of health systems. The available research indicates that it is essential for health care systems, regardless of country setting, to measure the key attributes of primary care quality, so that gaps can be identified and addressed. Quality improvement interventions have been documented in published articles focusing on the experiences and outcomes of specific improvement initiatives. The literature suggests that differing degrees of success are achieved by such initiatives, with a large array of narrative accounts

recording implementation experiences that were influenced by a variety of situational factors, which can essentially be classified as enablers or constrainers. Varying levels of detail on the factors impacting on implementations were provided in the reviewed articles, and such detail was often provided in the form of direct, first-person quotations. Thus, information on constraining and enabling factors was seen to be present, but such information was not readily accessible for the purpose of comparison or other analysis. This points to a need for the key facts or impressions to be extracted from narrative accounts, so that underlying trends and commonalities become apparent. The relative scarcity of literature also makes such extraction of key data desirable, if not imperative, to ensure that none of the rather limited information available is lost or overlooked.

Overall, therefore, a need exists for further research, which will aggregate individual experiences into a larger repository, from which general implementation principles may be abstracted. A study of these enabling and constraining factors of quality improvement implementation may inform the future design and implementation of quality improvement strategies. Such a study would ideally be structured as a qualitative, systematic review, concerned with assessing quality improvements at the primary care level, which will investigate enabling and constraining factors of quality improvement interventions and initiatives. Such review would provide an overview that may be consulted by health care management professionals and policy makers when considering quality improvement strategies in primary care.

Specifically, such a review should address the following questions:

1. What were the intentions and context of the recorded quality improvement initiatives, and to what extent did these contribute to, or hinder, the initiative?
2. What were the documented factors that served to promote or inhibit the implementation of the initiative, and what were the origins of such factors?

The thematic synthesis approach is an appropriate qualitative synthesis technique for this work. Such systematic review can be guided by Thomas and Harden (2008)'s approach to qualitative synthesis, which allows flexibility but encourages consistency.

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Closing the gap: a review of factors affecting quality improvement interventions at the primary care level

Part C: Article for Submission in *Quality Management in Healthcare*

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Background

The right to a healthy life, and health care which supports it, is universal. The constitution of the World Health Organisation (1997) includes "the enjoyment of the highest attainable standard of health as one of the fundamental rights of every human being without the distinction of race, religion, political belief, economic or social condition." Primary care is recognised as a core component of that right. Citizens, as patients, should be afforded accessible, available, acceptable, and quality health care. Thus health care facilities and services should function and exist in adequate supply; be affordable, understandable, physically accessible and non-discriminatory; uphold sectoral ethics and maintain appropriate population sensitivities; and be scientifically and medically appropriate (WHO, 1997). While high quality health care may not be a core component or bare minimum requirement of care, it is an aspect of care that allows the overall provision of acceptable universal care.

A review of the literature on the topic of quality in primary care reveals a wealth of research in high-income countries (HICs). Much less literature exists which deals with low and middle-income countries (LMICs). Although the implications of quality in primary care are different for LMICs, the global consensus is that the role of primary care is invaluable in reducing health inequality. An analysis of preventable deaths in children in 41 countries determined that 63% of deaths may have been avoided if primary care was fully implemented (Starfield et al., 2005). Quality improvements (QI) ensure that primary care fulfils the expectations "highest attainable standard of health." Quality improvements, for the purpose of this article, are defined as the activities or initiatives to more closely align medical practice with accepted best practices..

Question

What enables and constrains the implementation of quality improvement interventions at the primary care level?

Aim and Objectives

The aim of this review is to analyse quality improvement interventions at the primary care level (which attempt to close the gap between clinical research and practice).

The objectives of this review are to:

- Identify, synthesise and evaluate research literature relevant to primary care regarding quality improvement interventions.
- Identify the enabling and constraining factors impacting quality improvement at the primary care level.

Justification

Due to misuse of resources, primary care level facilities often perform below adequate measures of quality (Berwick, 2002). In the United States, between 44,000 and 98,000 lives are lost annually to preventable medical errors (Institute of Medicine, 1999). Between 20% and 40% of health resources are wasted (WHO, 2010). Increasing the quality of primary care has a positive impact on the cost, consumption and satisfaction rating of health care. Health care consumption and costs decrease while patient satisfaction and the contribution to overall health systems increase (Engstrom et al., 2001). Reduced costs are attributed to improved preventative care and a reduced number of hospitalisations (Starfield et al., 2005). QI measures are necessary to strengthen both health care processes and facilities, ultimately improving health care systems. Health care systems in LMICs were traditionally designed to manage primarily infectious diseases, along with child health and maternal health (Hanna and Kangolle, 2010). As such, these systems may not be inherently equipped to deal effectively with a broader range of care demands, and some intervention is likely needed to increase their capacity and capability. High quality care can, however, be provided even in resource-constrained systems (Peabody et al., 2006).

The range of QI interventions employed in LMICs differs significantly from those typically implemented in HICs. Interventions in LMICs tend to address the systemic level, with examples ranging from technology improvements, such as implementing electronic patient records, to improvements in collaboration (Mamlin et al., 2006; Peabody et al., 2006). Contrastingly, HIC-based interventions tend to address personal productivity, performance, and compliance with established protocols and best practices. Developing countries have an interest in quality of care, as an increasing number of health burdens threaten the wellbeing of patients. Quality interventions are necessary to streamline care standards and inefficient processes, so that these countries can deal with a new set of problems. This difference in emphasis may indicate that HICs have already applied time and financial resources to basic systemic improvements, while LMICs have yet to do so on an effective scale.

The learning investment in HICs may potentially be exploited by less affluent societies, which would enable them to effect systematic improvements more quickly and less expensively. Understanding the constraints, and the conditions for success, of documented interventions may also provide valuable insights in replicating such enabling conditions. The extent to which success depended on the conceptual soundness of interventions, versus the careful execution of the interventions, should become evident. This may suggest the relative emphasis to be placed on strategy formulation and strategy execution, respectively.

The potential value of this study lies in its contribution of a broad, global perspective to the existing literature. As of June 2011, no systematic review had assessed qualitative research into quality assurance and improvement

interventions, in primary care in a global context. Recent systematic reviews evaluating quality in primary health care either appraise a single QI intervention, or interventions for a specific disease. This study seeks to add to the literature by providing a review which spans multiple interventions across multiple diseases, and across studies drawn from different countries of different income levels.

Conducting such a study required a thorough review of previously documented experience. PubMed and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) were extensively searched for existing systematic reviews in similar topic areas. Using multiple combinations of relevant terms, and further manual searching, several hundred search results were evaluated. No systematic review of qualitative research methods, investigating enabling and constraining factors of QI at the primary care level, was found.

Methodology

Study Design

This study involved a qualitative, systematic review of previously undertaken qualitative research. Systematic reviews are methodical literature reviews which summarise existing research evidence, providing an 'interpretive context' that cannot be found in a single study (Hemingway and Brereton, 2009; Chalmers and Altman, 1995). Systematic reviews involving quantitative research do not provide information on decision-making factors, motivations or experiences (Dixon-Woods and Fitzpatrick, 2001). Qualitative data is more detailed in meaning and tends to provide a deeper, richer insight into context than random controlled trials (Popay et al., 1998). The aim of this study is to identify the elements that have been found to be supportive in implementing QI initiatives, rather than to measure the quantifiable outcomes of the interventions themselves. Qualitative data can therefore be regarded as more relevant to the aims of the study.

This review follows the methodological steps derived from Thomas and Harden (2008), who have developed an understandable approach to the synthesis of findings of qualitative research that is appropriate for use in public health. Methodological steps include searching by using specific keyword terms; assessing the quality of results using specified criteria; data extraction using specified criteria; translating concepts/synthesis by way of coding, developing descriptive themes, developing analytical themes, analysis and discussion of results (Thomas and Harden, 2008). Measures such as checklists and extraction sheets were implemented to control quality, and are appended. All attempts were made to develop a clear and transparent process.

Search Strategy

An extensive search of English language health literature was undertaken using PubMed and CINAHL. PubMed is a comprehensive medical journal database,

which includes MEDLINE results. CINAHL is an extensive nursing and allied health literature resource.

Articles published after the release of the report *Crossing the Quality Chasm: A New Health System for the 21st Century* were considered (Institute of Medicine, 2001). The report detailed the need for QI in primary care in the United States, in order to close the gap between clinical experience and practice. In addition to highlighting issues, the report emphasised possible strategies to improve quality in the health care system. All relevant articles published following the release of *Crossing the Quality Chasm* will likely have considered the report. The Institute of Medicine is a respected independent and non-profit organisation that publishes unbiased reports that focus on various issues in health care and medicine. A leeway of three months was afforded to account for publication time cycles.

Search Process

Several combinations of words were tested. Search terms were selected for topic relevance and the ability to narrow, not restrict, results. Keywords were selected which elicited a response from both PubMed and CINAHL. Test searches revealed that greater flexibility was needed in the article selection process. Titles and abstracts were searched.

The search process occurred in two phases. Phase One included terms pertaining to study design. These terms restricted results from quantitative research, including mixed-methodology. To incorporate a greater number of relevant articles, search terms related to study design were removed for Phase Two.

Table 1: Search process

Database	**Search terms**	**Total hits**	**Included hits**
PHASE ONE			
PubMed	"primary care" AND quality AND (improv* OR assurance) AND intervention NOT (review or quantitative or trial)	90	5
CINAHL		20	6
Total		110	11
Further Inspection			6
PHASE TWO			
PubMed	"primary care" AND quality AND (improv* OR assurance) AND intervention	323	14
CINAHL		33	4
Total		356	18
Further Inspection			5

Phase One search terms yielded 90 results from PubMed and 20 from CINAHL. Of these 110 results, 11 were selected for further consideration, based on their abstracts. The majority of results were excluded due to lack of relevance to the research question. Phase Two returned more results with less relevance. In total, 356 results were inspected. Phase Two yielded an additional 18 results for further consideration.

Article Selection

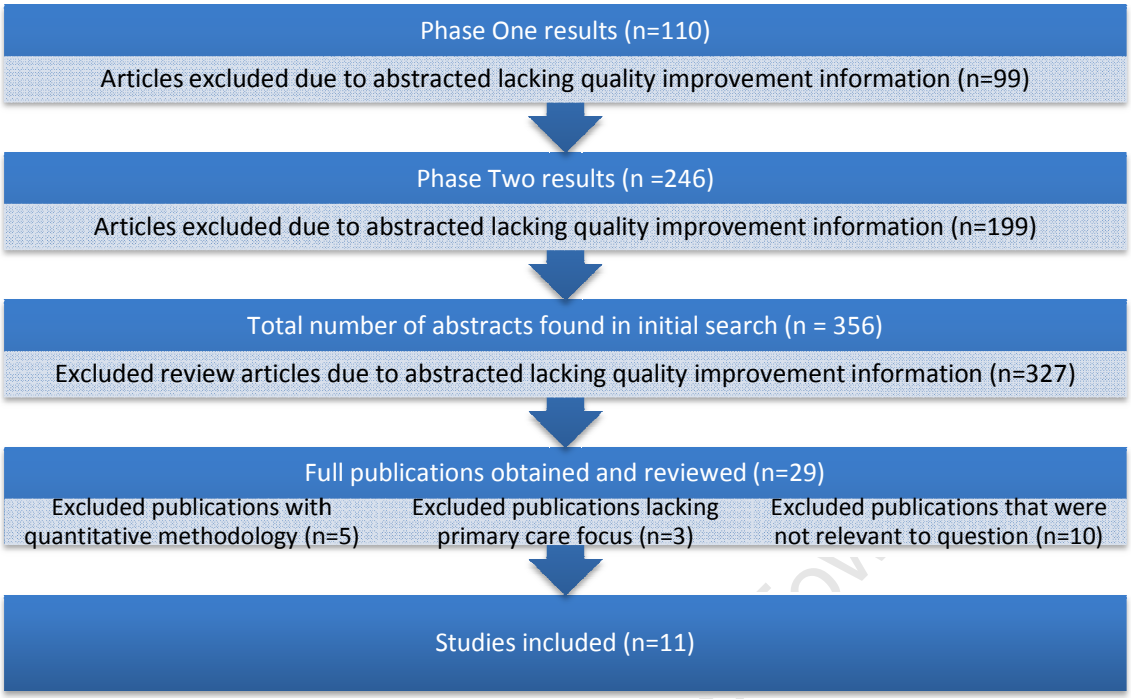
Articles' relevance was determined in relation to strict inclusion criteria. Articles that did not meet the criteria were not included in the systematic review.

Table 2: Article selection criteria

	Inclusion	**Exclusion**
Source	Academic journal	Not sourced from an academic journal
Date Published	Between June 2001 and June 2011	Prior to June 2001
Language	English	Not in English
Article	Abstract available	Abstract unavailable
	Full free article available under university subscription service	Full article unavailable
	References available	References unavailable
Research design	Qualitative data collection and analysis methods	Strictly quantitative methodology
Topic	Quality improvements interventions	No intervention
	Primary care level	Not at the primary care level
	Relevant to research question	Not relevant to research question

Literature was further inspected for content relevance as articles may have misleadingly labelled keywords resulting in improper database referencing. This ensured that only appropriate literature was included in the review. Article abstracts, and articles themselves as required, were read to confirm appropriateness of inclusion. A final total of 11 articles qualified for critical appraisal.

Figure 1: Excluded articles



Two phases of title and abstract searching collected 356 articles. Of the 110 found in Phase One, 99 articles were rejected. Of the 246 articles found in Phase Two, 199 were rejected. 29 articles, 5 were excluded based on using exclusively quantitative methods for analysis. An additional 3 were excluded due to lack of a primary care focus. A further 10 were excluded based on lack of relevance to the research question. The study included the remaining 11 articles.

Literature was assessed using the appended Critical Appraisal Tool, produced by the Oxford University's Public Health Resources Unit (Milton Keynes Primary Care Trust, 2002). The tool was used to guide judgment on article quality (and subsequent inclusion), using basic questions with detailed prompts. Articles were systematically assessed according to their research design, sampling strategy, data collection, reflexivity, ethics, analysis, findings, value of research, and persuasiveness of argument. Each appraisal contained an open text comment portion to track the principal investigator's judgment. All articles deemed acceptable for inclusion by the principal investigator were noted in an appended article summary form, used to systematically extract pertinent information and summarise data. All articles were deemed appropriate for inclusion. Although articles were not weighted based on quality, the strength of papers was considered during analysis.

Data Collection

Data were extracted from articles' study findings. All relevant sections labelled 'discussion' were considered as study findings. Text was isolated and synthesised.

Data Analysis

Data were analysed using thematic analysis, as outlined by Thomas and Harden (2008). Analysis occurred in three stages: line-by-line coding, creation of descriptive themes, and creation of analytical themes. Coding was largely an inductive process, with codes and themes emerging from the text (Thomas, 2003). The process was repeated until sufficiently abstract and analytical terms surfaced, revealing underlying implementation factors in exact language. In some cases, literature and theory were used to guide coding and the development of descriptive themes around the nature of QI interventions. Due to the wide range of recorded QI interventions which assess aspects of quality in primary care, this repetitive analysis and coding was deemed important, in order to reduce the data to meaningful groupings. These literature-driven codes included, but were not limited to, Ovretveit's (1998)'s stakeholder focus of patient/client, professional/health worker, and provider/management, and Donabedian's (1980) dimensions (of process, structure, and outcome).

Derivation of Analytical Codes

The analytical (level three) codes were derived from the descriptive (level two) codes, which had emerged from the line by line (level one) coding of the narrative contained in each article included in the review. This process involved an abstraction of the specific comments that were recorded in relation to the implementation of particular QI interventions.

The derived alphabetic codes represent the positive or negative nature of a particular implementation attribute noted in an article (**E**nabler or **C**onstraint), the intended area of impact of the intervention being implemented (**S**tructure, **P**rocess or **O**utcome), and the source of the enabler or constraint (**C**lient/patient, **P**rofessional/physician/health-worker, **M**anagement/Institution/authority or **D**esign of intervention). Physicians may fulfill functions as both professionals and management; this ambiguity was resolved by examining the extent to which a particular behaviour or attitude pertained to one of those roles, thus allowing an incident to be assigned to the appropriate code group. The aggregate of the nature of the implementation attribute, the intended area of impact, and the source of the attribute, results in a three letter code, e.g. **ESC**, which provides the context for the analytical codes.

The descriptive level one codes extracted from the reviewed articles were subjected to a process of abstraction. The abstracted constraints and enablers were examined for duplication, and for logical groupings suggested by the data themselves. This allowed the creation of code groups. The number of analytical codes is not evenly distributed across the code groups, as no pre-existent coding framework was imposed on the data, and no artificial compliance with any framework was enforced. The code groups are represented by summary level numeric codes; each group in turn contains subordinate codes that represent the abstracted implementation attributes found in the reviewed articles, with duplicates removed.

By mapping the numeric codes against the alphabetic codes, a representation was obtained of the aggregated experience of implementing QI initiatives. Mapping preserves the context of the enabler or constraint that was recorded in each article reviewed, without the need for further reference to the articles themselves.

Overview of papers

Table 3: Summary of papers

#	AUTHOR, DATE	INCOME LEVEL	COUNTRY	LEVEL	FOCUS	INTERVENTION	METHODS OF DATA COLLECTION	STUDY LIMITATIONS
1	Antoline et al., 2011.	High	United States	Structure	Diabetes	Diabetes management program for DM patients aged 18-80, with goals to increase The Healthcare Effectiveness Data and Information Set scores to 75th and improve overall patient health.	Chart reviews, telephonic interviews	Analysis poorly explained
2	Balasubramanian et al., 2010.	High	United States	Process	Change management strategy for primary care	Reflective adaptive process teams as a change management strategy for primary care, with goals to enhance communication and decision making to improve adherence to multiple clinical guideline	Observation, key informant in-depth interviews, descriptive field notes, practice summary reports	No recruitment information
3	Bekkers et al., 2010.	High	United Kingdom	Process	Antibiotic prescribing	Educational program for antibiotic prescribing practices, with goals to enhance the quality of antibiotic prescribing and raise awareness about antibiotic resistance among general medical practitioners. I	Telephonic interviews	Possible recall bias and related issues as reporting took place long after intervention
4	Shuval et al., 2007.	High	Israel	Process	Prescriptions	Evidence-based medicine	Focus groups and interviews	Possible "healthy worker"

						educational intervention with goals of evaluating the impact of said intervention on the knowledge, attitudes, and clinical behavior of participating physicians and patients		effect where participants may act differently under supervision
5	Bradley and Igras, 2005.	Low	Guinea and Kenya	Process	Health systems and supporting implementation of Integrated Management of Child Health.	Client-oriented, provider-efficient services supporting the implementation of integrated management of child health, with the goal of strengthening the health system	Pre- and post-intervention observation, facility audits, staff and client surveys, and focus groups	Methods not well explained
6	Epstein at al., 2008.	High	United States	Process	Attention-Deficit/Hyperactivity Disorder Assessment and Treatment Practices	Promotion of adoption of evidence-based practices for attention-deficit/hyperactivity disorder assessment and treatment practices, with the goals of improving community-based primary care providers' adherence guide- lines	Review of patient charts pre- and post-training	Possible flaws in data collection
7	Elwyn et al., 2008.	High	United Kingdom	Process	Reduce hospital admissions	Case management by nurses, with the goal of reducing hospital admissions	Analysis of case manager case reports	Possible flaws in data collection and recruitment of participants
8	Kirsh et al., 2008.	High	United States	Structure	Diabetes	Shared medical appointments for diabetes patients, with the goal to identify themes and issues that will inform others interested in conducting organizational change	In-depth case analysis	No recruitment information
9	Olbort et al., 2008.	High	Germany	Structure	Chronic heart failure	Case management of chronic heart failure by	Focus groups	Trial context may not be reflective of

						doctors' assistants, with the goal to improve chronic heart failure care in general practice:		actual scenarios
10	Rubensteign et al., 2002.	High	United States	Structure	Depression	Central quality improvement team for depression, with the goal of creating and implementing sustainable depression care improvement programs	Qualitative observations, semi-structured interviews, telephonic interviews	Lack of rigour in content analysis
11	Sennun et al., 2006.	Upper Middle	Thailand	Structure	Health system	Participatory supervision model to assess health system, with the goal of comparing two supervision models and the effect on the health promotion capacity of health officers	Questionnaires, semi-structured interviews, qualitative observations	Selection bias of health officers and supervisors, possible "healthy worker" effect

Eleven papers were included in this systematic review of enablers and constrainers within a primary care QI intervention. The range of included interventions varied from provider reminders, provider and/or patient education, medication management, care coordination, team or personnel changes, organizational change, and disease or case management. Some papers offered more insight than others. All papers employed qualitative research techniques such as case analysis, focus groups, in-depth interviews, and observation. Study limitations, as outlined in the above chart, were noted. Due to the small number of selected papers, limitations were considered carefully, but were not considered material enough to justify their exclusion.

Papers were analysed according to a number of different approaches. Firstly, papers were analysed according to Donabedian's three levels of quality intervention (Structure, Process, and Outcome), while also giving consideration to the classification of intervention. Interventions with similar focus (such as diabetes and prescriptions), and interventions of the same type (case management and educational programs) were compared and contrasted. In addition, the papers were compared and contrasted in terms of country setting. Donabedian's (1980) levels and Ovretveit's (1998) perspectives on positive and negative influences on health interventions form the basis of the classification scheme employed in the analysis of the reviewed literature; an additional category ("Design") has been added to account for design-based enablers and

constrainers, as dictated by findings in the data. The classification categories are depicted in the figure below.

Figure 2: Classification of identified Enablers and Constrainers, according to Donabedian's (1980) intended area of impact, and a modified version of Ovretveit's (1998) source of positive or negative influence.

Intended Impact of Quality Improvement Intervention	**Source of Enabler or Constrainer**			
	Clients	*Professionals*	*Management*	*Design*
Structure				
Process				
Outcome				

The majority of papers were from a high-income setting: six from the United States (1, 2, 4, 6, 8, 10); two from the United Kingdom (3, 7); one from Germany (9); and one from Israel (14). Two papers were in a low-to-middle-income setting, with one paper (5) set in the low-income settings of Guinea and Kenya; and one paper (11) set in the middle-income county of Thailand.

All papers involved interventions that were aimed at either process (2, 3, 4, 5, 6, 7) or structure (1, 8, 9, 10, 11); none examined outcome. Experiences were also compared between intervention focus and intervention type. A number of papers shared similar medical focuses such as diabetes (1, 8) and prescriptions (3, 4). Several papers examined different medical issues using similar strategies such as case management (7, 9) or educational programs (3, 4).

Table 4: Summary of the enabler and constrainer attributes, differentiating between those that were common (appearing in at least three articles) and those that were unique (appearing in one or two articles). These experiences are discussed in more detail below.

#	AUTHOR, DATE	INTERVENTION	ENABLER ATTRIBUTES (Common and Unique)	CONSTRAINER ATTRIBUTES (Common and Unique)
1	Antoline et al., 2011.	Diabetes management program for DM patients aged 18-80, with goals to increase The Healthcare Effectiveness Data and Information Set scores to 75th and improve overall patient health.	Common: support of management, multi-disciplinary team members Unique: leadership by management, continuous education, even workload distribution, continuation of care, disease-specific management	Common: none Unique: absence of monitoring and evaluation, lack of protocol adherence by collaboration facilities, conflict between processes, lack of existing systems
2	Balasubramanian et al., 2010.	Reflective adaptive process teams as a change management	Common: none Unique: engagement by	Common: breakdown of communication

		strategy for primary care, with goals to enhance communication and decision making to improve adherence to multiple clinical guideline	management, encouragement of discussion and ideas, incremental nature of change, ability to exploit time sensitive changes, continuous tailoring	Unique: dysfunctional team, feared by staff, insufficient openness in communication, belittlement by management, superficiality of support, absence of leadership, lack of sincerity, absence of monitoring and evaluation, overly strong management control, unclear patient communication, prescription protocol problems
3	Bekkers et al., 2010.	Educational program for antibiotic prescribing practices, with goals to enhance the quality of antibiotic prescribing and raise awareness about antibiotic resistance among general medical practitioners. I	Common: flexibility of intervention Unique: encouragement of discussion and ideas, respect of peers, high degree of motivation, positivity of attitudes, patient-centred intervention	Common: disruptiveness of intervention Unique: perceived wastefulness, excess of steps and procedures, degree of technical difficulty, unrealistic components
4	Shuval et al., 2007.	Evidence-based medicine educational intervention with goals of evaluating the impact of said intervention on the knowledge, attitudes, and clinical behavior of participating physicians and patients	Common: flexibility of intervention Unique: empowering of staff, positivity of attitudes, use of incentives	Common: none Unique: Poor understanding of health care, request for redundant treatments, failure to keep abreast of continual medical updates, uncertainty, busy urban setting, degree of technical difficulty, use of jargon, age of physician, lack of physician's computer skills, general practice time constraints,
5	Bradley and Igras, 2005.	Client-oriented, provider-efficient services supporting the implementation of integrated management of child health, with the goal of strengthening the health system	Common: presence of team work, support of management, perception of appreciation, sense of ownership Unique: committed team members, external support, high degree of motivation, empowering of staff, introduction of practice prompts, external stimulation as catalyst for change	Common: none Unique: lack of guidance, lack of feedback, lack of motivation, lack of training, lack of tools, skills and knowledge deficits, insufficient resources
6	Epstein at al., 2008.	Promotion of adoption of evidence-based practices for attention-deficit/hyperactivity disorder assessment and treatment practices, with the goals of improving community-based primary care providers' adherence guide- lines	Common: support of management Unique: none	Common: none Unique: prescription protocol problems, logistical issues, failure to keep abreast of continual medical updates, inability to optimise medication maintenance, unrealistic components
7	Elwyn et al., 2008.	Case management by nurses, with the goal of reducing hospital admissions	Common: none Unique: simplification of practice, patient-centered intervention	Common: breakdown of communication Unique: lack of mobility, reliance on incorrect information, requirement for team of carers, poor personal disease management, inability to optimise medication maintenance, lack of handover arrangements, lack of follow up arrangements
8	Kirsh et al., 2008.	Shared medical appointments for diabetes patients, with the goal to identify themes and issues that will inform others	Common: sense of ownership, presence of team work, multidisciplinary team members, support of management, perception of appreciation, flexibility of intervention	Common: disruptiveness of intervention Unique: flexibility of intervention, ability to alter relationships, unclear protocol, lack of focus, change of management priorities,

		interested in conducting organizational change	Unique: perseverance in pursuing implementation goals, ability to transform to context, ability to exploit time-sensitive changes, ability to pilot test, high degree of motivation, committed team members, continuous education, quality improvement team members, collective decision making, existence of referrals to collaborating facilities, "burning platform," ability to pilot test, continuous tailoring, ability to transform to context, continuous context adjustment, standardisation of practice, innovation of intervention, novelty of intervention, reinforcement of existing health promotion agenda, ownership by management, interdisciplinary management, existence of open forum, key stakeholders as team members, sense of significance	lack of provider involvement, insufficient resources, absence of monitoring and evaluation
9	Olbort et al., 2008.	Case management of chronic heart failure by doctors' assistants, with the goal to improve chronic heart failure care in general practice:	Common: perception of appreciation, sense of ownership, support of management Unique: positivity of attitudes, insight into other hierarchy roles, interest by patients, cooperation from patients	Common: disruptiveness of intervention Unique: coercion by management, perception of under appreciation, increased workload, unofficial overtime expected, lack of initiative, emotional involvement with patient, sense of insecurity, alteration of routine
10	Rubenstein et al., 2002.	Central quality improvement team for depression, with the goal of creating and implementing sustainable depression care improvement programs	Common: support of management, presence of team work, multidisciplinary team members Unique: ability to pilot test, external support, respect of peers, quality improvement team members	Common: none Unique: increased resource use
11	Sennun et al., 2006.	Participatory supervision model to assess health system, with the goal of comparing two supervision models and the effect on the health promotion capacity of health officers	Common: presence of team work, sense of ownership Unique: collective decision making, respect of peers, community pride, interdisciplinary management, participation by management, ownership by management, community focus of intervention, locally driven solutions, reinforcement of existing health promotion agenda	Common: breakdown of communication Unique: insufficient openness in communication, unrealistic intervention components, unofficial overtime expected, increased workload, requirement of team involvement

It should be noted that individual papers offered differing degrees of detail and insight, which may have an influence on the frequency with which enabling and constraining factors were mentioned in a given paper; less detailed articles may, for example, only have referred to the most material factors, while omitting others which were considered to have less impact on an intervention. This could have the effect of skewing the overall occurrence count of individual factors.

Much of the analysis of the selected articles centred on the types of enablers and constrainers encountered, depending on the *intended impact* of the intervention, and the *source* of the enablers and constrainers. A number of notable observations were made in this regard. Across different interventions, the same constrainers were noted as emanating from different sources. A breakdown of communication, insufficient openness in communication, and the expectation of unofficial overtime were identified as common impediments, but were attributed to multiple different sources. For example, overtime was expected both from medical staff (Olbort et al., 2008) and from management (Sennun et al., 2006).

Similarly, enablers were noted as arising from different sources for different interventions. In a diabetes management program study, continuous education as an enabler originates from two levels within a single intervention, namely management and professionals (Antoline et al., 2011). This finding is worth noting, although no real significance could be attached to it.

Discussion

The most frequently recurring ("common") enablers and constrainers are identified below. Recurring enablers and constrainers are discussed in decreasing order of frequency, within the context of all the articles in which they are mentioned. Although the context of enabling and constraining factors (in terms of intervention focus and types) was considered, no significant patterns of experience, in terms of commonalities and differences, were identified. Comparisons across country setting are presented separately.

Enablers

Table 5: Most frequently occurring ("common") enablers

KEY ENABLING FACTORS	NUMBER OF PAPERS	PAPERS
Support of management	6	1, 5, 6, 8, 9, 10
Sense of ownership	4	5, 8, 9, 11
Presence of team work	4	5, 8, 9, 10
Flexibility of intervention	3	3, 4, 8
Multidisciplinary team members	3	1, 10, 11
Perception of appreciation	3	5, 8, 9

Enabling factors tended to be attributed less to interventions themselves, and more to the people implementing and executing an intervention. The articles mentioned a variety of human attributes, ranging from staff attitudes to management support. One indicator of the possible prevalence of any factor is the frequency with which it is mentioned across multiple articles. Again, it should be noted that the frequency of mention may also be the result of varying degrees of detail in individual articles.

The most widely encountered enabling factor was the support of management, which was cited in six articles. The majority of articles reference the receiving of support as important, but do not discuss the nature of support. In a depression improvement intervention, it was noted that "no [Local Team] depression

improvement program succeeded in a practice without high ratings on either support from mental health specialty or clinical practice leadership (Rubenstein, 2010: p. 1021)". A further example references support from management, stating that leadership had a history of support for implementation of clinical improvements and was "strongly supportive of improvement efforts (Kirsh, 2008)". Some articles referenced the nature of managerial support. Olbort et al.'s (2008) article cites a typical example. In a case management study the participants, comprised of doctors' assistants, noted that receiving support – especially from the general physician - was critical, especially as it allowed a better understanding of their new case manager roles (Olbort et al., 2008). In testing a new quality improvement approach for child health, Bradley and Igras (2005) noted support of management was critical in problem resolution, as staff did not have the authority to secure needed supplies. Management was also needed to support staff in order to remain engaged in resolution efforts.

A number of other factors were each mentioned in three or four articles, namely the perception of appreciation, the use of multidisciplinary team members, the presence of teamwork, and a sense of ownership. This can be seen in the implementation of an integrated management intervention, which clearly outlines the aforementioned factors:

> "Staff told us that […] creating an enabling environment for staff to do those things themselves, is what stimulated action and created change. This very ownership of problems and their solutions […] had a strong impact on staff attitudes toward their work environment and in changing their own behaviours/interpersonal interactions with other site staff as well as with clients. This was reinforced by feelings that management, supervisors, and clients appreciated them and were relying on them to make good decisions (Bradley and Igras, 2005: p.398)."

Flexibility of the intervention was noted in three articles. In the shared medical appointments intervention for diabetes patients, flexibility was highlighted as a promoting factor due to "adaptability to situation/needs of local context/ target group (Kirsh, 2008: p.9)". The remainder of the enablers that were mentioned twice related to the patient centeredness of interventions, the ability to exploit time sensitive changes, the ability to conduct a pilot or test, flexibility in tailoring the initiatives as needed and the provision of continuous education. This implies that adaptability, rather than rigidity, was more likely to increase adoption of initiatives. Kirsh (2008: p.7) articulates these enablers by stating, "Promoting factors included the mandate for action to address performance deficiencies, the so-called 'burning platform' and the simultaneous freedom and flexibility to pilot test to secure buy-in." Interventions were also more likely to be supported if they focused on the patient and if implemented during a window of opportunity. This appears to suggest that certain circumstances increase receptiveness to innovations, during which intervention objectives were more likely to be embraced. Therefore, interventions should be designed with the requisite

flexibility to adjust their approach and focus, as well as the scheduled timing of the implementation. In the shared medical appointment intervention, the implementers were given freedom to conduct pilot implementations, and the flexibility to "fine tune" and adjust the intervention (Kirsh et al., 2008). Team members met after each shared medical appointment, where various members took turns volunteering extra effort to support the shared medical appointments during non-clinical time, with activities such as making extra phone calls, generating letters to new patients, tracking patient satisfaction data, and meeting to change process flow, if needed. The ability to effect mid-course corrections surfaced as a mentioned prerequisite for ease of implementation. Bekker's et al.'s (2010) antibiotic prescription educational program was heralded for its flexibility in accessing the program and its allowance for adaptable independent learning.

Other enablers also appear in multiple articles, although with lower frequency. Two separate studies investigated the outcomes of educational interventions in the handling of prescriptions (Bekkers et al., 2010; Shuval et al., 2007). These studies share one group level code relating to positive staff attributes as an enabler. Comments in the reviewed articles suggest that staff should be valued and supported to ensure their enthusiastic participation. This may be interpreted as a need for inclusion of measures to combat staff indifference and apathy.

Two studies dealing with diabetes were noted to have number of enablers in common. In the first study, a shared medical appointments intervention for diabetes patients, team members took turns after each appointment ensuring all extra work was taken care of (Kirsh et al., 2008). A second diabetes-focused study also investigated treatment (Antoline et al., 2011). Antoline et al. (2011) assessed a diabetes management program by implementing a committee to design and execute the intervention; Kirsh et al. (2008) utilised in-depth case analysis to assess shared medical appointments for diabetes patients. These studies shared three enabling factors: the use of multidisciplinary team members, the support of management, and continuous education. In addition to a need to be valued, the need for staff to be encouraged and motivated by engaged management was cited. A sense of collaborative, multidisciplinary ownership was mentioned as a desirable condition for success. This may point the importance of leadership (which is intuitive, where direction is provided by inspirational example), rather than mere mechanistic management (which is trainable, where direction is assigned), provides motivational impetus and a unifying sense of purpose across disparate disciplines. In essence, strong emphasis was placed on the posture of management including the empowering of staff, a sense of support from management, as well as the perception of appreciation.

A number of other enablers were each mentioned in two articles. Approximately half of these factors were concerned with the creation of an enabling work atmosphere, including engagement by management, collective decision-making, the empowering of staff, the presence of committed team members, a high

degree of motivation, and the respect of peers. Staff empowerment was achieved in various ways, including additional scope of control. In the evidence-based medicine educational intervention, as an example, the intervention itself gave participants confidence, as "Most facilitators found that teaching the course enhanced their own knowledge and skills (Shuval et al, 2007)."

Constrainers

Table 6: Most frequently occurring ("common") constrainers

KEY CONSTRAINING FACTORS	NUMBER OF PAPERS	PAPERS
Disruptiveness of intervention	3	8,9,
Breakdown of communication	3	2, 7, 11

As with enablers, constrainers were also found to occur in varying frequencies across the articles reviewed. The disruptiveness of an intervention was singled out in three different articles. In the educational intervention for antibiotic prescribing practices, the busy workload of general physicians is acknowledged as an issue, "GPs' generally heavy workload makes it difficult to reserve time for what are essentially non-core activities (Bekkers et al., 2010)."

The breakdown of communication was noted as a constrainer in three different articles. Insufficient openness in communication, on the other hand, was cited in case management focused articles (Elwyn et al., 2008; Olbort et al., 2008). Both studies required nurses to fill case manager roles. These studies do not share any specific codes, but share constraints at the group level of coding; therefore, the specific constrainers encountered were different, but were found in the same general area, namely the presence of negative patient behaviour. In Elwyn et al.'s (2008) study, immobile patients often required a number of carers, whereas in Olbort et al.'s (2008) study, patients were often unmotivated and uncooperative. Both studies also reported aspects of communication breakdown. The breakdown in communication was found to occur in various relationships such as management-staff or staff-patients, as illustrated in the following example. In the intervention examining nurses in case manager roles for patients with chronic heart failure, the communication breakdown occurred between management and staff (Olbort et al., 2008). Staff members involved in discussion with management about the role were more likely to respond positively to the intervention. Staff members nominated into the role without their consultation felt coerced into the position and were more likely to respond negatively to the intervention. In the intervention investigating nurses in the role of case manager in an effort to reduce hospital admissions, the communication breakdown occurred between staff and patients (Elwyn et al., 2008). In one event, a patient who was unable to read was given written advice about his medication.

A number of constraining factors appeared in two studies: the absence of monitoring and evaluation, the existence of logistical issues, the degree of technical difficulty, excessive steps and procedures, unrealistic intervention components, insufficient openness in communication, and the expectation of

unofficial overtime labour. Many of the above constrainers are related to intervention design. The failure to anticipate resistance at the design stage appears to be noteworthy: where interventions were unwieldy or cumbersome, this seemed to result in significant resistance to implementation. The degree of technical difficulty inherent in educational interventions appeared in two articles dealing with two prescription-focused studies (Bekkers et al., 2010; Shuval et al., 2007). Web-based components of both educational interventions proved difficult for many health professionals to use, either because of their lack of computer experience or the cumbersome nature of the intervention. In two studies dealing with QI in diabetes treatment, the absence of monitoring and evaluation was identified as a common constraint (Antoline et al., 2011 and Kirsh et al., 2008). In the diabetes management program, there was no existing system to generate outcome and productivity reports. This event suggests a failure to anticipate foreseeable problems during the planning stage. Patient co-operation also emerged as a constraint in two articles. Patients were sometimes not viewed as an asset to intervention implementation, especially for process focused interventions. As examples, patients were sometimes disinterested in the intervention, or did not see how the intervention improved the status quo (Olbort et al., 2008; Shuval et al. 2007). In addition to the negative influence of these clients, clients also failed to make any positive contribution: there were no client-sourced enabling factors in the process or structure focused interventions. This could be attributed to a lack of invitation to participate, or because patients were not examined as part of the study.

The Effect of Country Income Level on Enablers and Constrainers

The economic setting appeared to make little difference in the difficulty of implementing QI in the sets of enablers and constrainers. Interventions in both HICs and LMICs benefitted from being implemented in a cooperative environment with shared interests and responsibility. In all settings, overly ambitious and idealistic interventions constrained practical implementation. A notable example of impractical interventions is the video component of the educational program intervention for antibiotic prescribing practices. Participants noted the lack of authenticity, with one participant explaining, “There was some amusement during the video consultation with the various patients and doctor scenarios because it all seemed to go so beautifully according to plan and the patients never argued and there was lots of time (Bekkers et al., 2010: p.7)”.

Health care workers were acknowledged as being busy regardless of the setting, and thus interventions requiring significant extra work were not well embraced. The severity of a constraint was in some instances attributed to the level of disruption caused by an intervention; the view was expressed that interventions should not unduly upset the established daily routine of a practice.

Poor and insufficiently open communication was identified as a common constraint across economic settings. Similarly, the articles reviewed also identified other common constraints, which may be summarised as the presence

of unrealistic intervention components, and the expectation of unofficial overtime work.

Some differences were, however, noted. In high-income countries, constraining factors appeared to arise less from the capacity and attitude of human resources, than was the case in less affluent countries. The nine high-income based country papers provided a combined total of 67 constrainers, of which only a quarter dealt with human resource problems. Half the human resource related constrainers were found in a single article addressing change management in primary care (Balasubramanian et al., 2010). This observation may be skewed, as some papers of studies in high-income countries may not report human resource related constrainers. Of the only two LMICs studies, 14 out of a combined total of 14 constrainers involved human resources issues, such as overextended management and a lack of guidance. For example, in observations of health systems in Guinea and Kenya, health professionals tended to know how to provide quality service, but "they sometimes forget; or they are unable to do a good job because they lack the tools or the technical expertise, or they lack feedback on their performance; or they are so demoralised that they have given up trying to understand and interact personally with their clients (Bradley and Igras, 2005: p.397)."

The health professionals from Guinea and Kenya had an increased workload due to collecting work results, preparing problem analysis and problem solving for presentation to their supervisor (Bradley and Igras, 2005). Moreover, the required participation had the potential to cause conceptual arguments among the team that could lead to conflict. From the standpoint of the participants, the officers' participatory supervision did not always proceed well, and not all health officers could participate in every step of the supervision process, due to their client service obligations. This seems to contradict the previously mentioned importance of supportive management as an enabler.

From the observations made, the commonalities in enablers appear to be greater than the differences. A significant number of shared enabling factors were also noted in HICs and LMICs alike. Many of these focus on a particular environment of human interaction that was created to facilitate the interventions. The elements of this human environment include a discernible presence of teamwork, collective decision-making, a shared sense of ownership, and the respect of peers. This is neatly summed up in discussing the enablers of an intervention implementing shared medical appointments for diabetes patients:

> "We believe that the most essential factors were the formation of a core team committed to quality and improvement, and the leadership provided by the clinic director that was supported strongly by the team members (Kirsh et al., 2008: p. 7)."

Within the papers based on high-income country experience, a number of observations relating to the United States deserve mention. A relatively large

number of articles dealing with QI have originated from the United States, and six articles from that country met the criteria for inclusion in this review of eleven articles. A number of observations were made from the interventions described in these six articles. All but one had a negative *system* attribute as a constrainer; half had a constraint relating to poor management; half had a constraint inherent to intervention design; and half had structural optimisation as an enabler. This may be interpreted as suggesting that a health system that is relatively affluent and mature may nonetheless be subject to failures that could arguably be diagnosed and corrected over time. Significant systemic difficulties appear to persist in spite of relatively sophisticated and evolved healthcare practices.

High-income countries tend to experience system constrainers, as opposed to LMICs, which tend to experience human resources. The importance of open management and teamwork cannot be overstated, in LMICs as elsewhere. Based on the data, frequent enablers and constrainers reveal that open communication and committed leadership are essential in the successful implementation of QI interventions.

Conclusion

Interventions aimed at QI in primary care do not experience uniform ease of implementation. Experience suggests that it is, however, possible to create the conditions necessary for success. These conditions are in large part concerned with properly harnessing the human capital that is required to effect improvement initiatives, through the creation of a nurturing, supportive and collaborative working environment, and through the provision of inspirational leadership by management. Human actors frequently emerge as either enabling or hindering the implementation of a particular QI initiative. These actors include both patients and providers of care. In addition to the pervasive need for effective communication, an emphasis is also needed on thorough planning at the design stage of any intervention, and the need for flexibility to adjust to dynamic circumstances. These observations remain valid regardless of the economic setting of any particular health system, or the amount of resources at its disposal.

Limitations

This article is limited, first, by the number of papers that were included for review. The search terms selected were quite narrow in focus, in an effort to avoid identifying too large a number of less relevant papers. However, due to the narrow focus it is likely that relevant articles were excluded. Articles with a specific focus on, for example, HIV or TB interventions implemented at the primary care level. Although both article titles and abstracts were searched for key terms, some studies may also have not been selected due to their specific word use. The search terms may not be appropriate as language choice can

differ regionally. This review employed a global focus, which may have limited the search process. The choice of the term “quality”, for example, may have limited articles from high-income countries where the term “clinical governance” is considered more appropriate.

Second, a limited range of experiences were identified. The small number of differing experiences, and the possibility of reporting bias in the issues raised in papers, means that conclusions cannot be generalized. The author’s comments on the limitations of each paper reviewed are documented earlier in this article. Due to the small number of papers meeting the inclusion criteria, no paper was rejected based on its critical appraisal. Articles were not weighted on quality, although the review may have benefitted from placing greater emphasis on stronger articles. The strength of papers was noted, but it did not guide analysis.

Third, the review was based exclusively on the opinion of the principal investigator. The supervisor assisted in providing literature to inform the methodology, and played an important role in the early stages of the dissertation. The addition of a second investigator assessing the inclusion and exclusion of the papers would have been beneficial to the review. Time and budget did not permit the inclusion of a second investigator. The guidance of a strict protocol assisted the principal investigator in drawing conclusions from the experiences examined.

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Closing the gap: a review of factors affecting quality improvement interventions at the primary care level

Part E: Appendices

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May 2012

Table of Contents:

Appendix 1: Quality Checklist

ID Number:
Author/s:
Journal and year:
Article Title:

PRESCREENING			
QUESTION	YES	UNSURE	NO
Was there a clear statement of the aims of the research? – what the goal of the research was – why it is important – its relevance			
Is a qualitative methodology appropriate? – whether the research seeks to interpret or illuminate the actions and/or subjective experiences of research participants			
COMMENTS			

Appropriate research design			
QUESTION	YES	UNSURE	NO
Was the research design appropriate to address the aims of the research? – whether the researcher has justified the research design			
COMMENTS			

Sampling			
QUESTION	YES	UNSURE	NO
Was the recruitment strategy appropriate to the aims of the research? - whether the researcher has explained how the participants were selected – whether the researcher explained why the participants selected were the most appropriate to provide access to the type of knowledge sought by the study – whether there are any discussions around recruitment			
COMMENTS			

Data collection			
QUESTION	YES	UNSURE	NO
Were the data collected in a way that addressed the research issue? – whetherthe setting for data collection was justified – whether it is clear how data were collected – whether the researcher has justified the methods chosen – whether the researcher has made the methods explicit – whether methods were modified during the study. If so, has the researcher explained how and why? – whether the form of data is clear			

– whether the researcher has discussed saturation of data			
COMMENTS			

Reflexivity (research partnership relations/recognition of researcher bias)			
QUESTION	YES	UNSURE	NO
Has the relationship between researcher and participants been adequately considered? – whether the researcher critically examined their own role, potential bias and influence during: – formulation of research questions – data collection, including sample recruitment and choice of location – how the researcher responded to events during the study and whether they considered the implications of any changes in the research design			
COMMENTS			

Ethical Issues			
QUESTION	YES	UNSURE	NO
Have ethical issues been taken into consideration? – whether there are sufficient details of how the research was explained to participants for the reader to assess whether ethical standards were maintained – whether the researcher has discussed issues raised b the study – whether approval has been sought from the ethics committee			
COMMENTS			

Analysis			
QUESTION	YES	UNSURE	NO
Was the data analysis sufficiently rigorous? – whether there is an in-depth description of the analysis process – whether thematic analysis is used. If so, is it clear how the categories/themes were derived from the data? – whether the researcher explains how the data presented were selected from the original sample to demonstrate the analysis process – whether sufficient data are presented to support the findings – to what extent contradictory data are taken into account – whether the researcher critically examined their own role, potential bias and influence during analysis and selection of data for presentation			
COMMENTS			

Findings			
QUESTION	YES	UNSURE	NO
Is there a clear statement of findings? – whether the findings are explicit – whether there is adequate discussion of the evidence both for			

and against the researcher's arguments – whether the researcher has discussed the credibility of their findings – whether the findings are discussed in relation to the original research questions			
COMMENTS			

Value of the research			
QUESTION	YES	UNSURE	NO
How valuable is the research? – whether the researcher discusses the contribution the study makes to existing knowledge or understanding – whether they identify new areas where research is necessary – whether the researchers have discussed whether or how the findings can be transferred to other populations or considered other ways the research may be used			
COMMENTS			

Argument			
QUESTION	YES	UNSURE	NO
Was the article persuasive?			
COMMENTS			

Appendix 1-001: Quality Checklist

ID Number: 001
Author/s: Catherine Antoline, Amy Kramer, Mark Roth
Journal and year: *The Permenentre Journal,* 2011
Article Title: Implementation and Methodology of a Multidisciplinary Disease-State-Management Program for Comprehensive Diabetes Care
Context and Geographic focus: High Income, United States

Prescreening			
QUESTION	YES	UNSURE	NO
Was there a clear statement of the aims of the research? – No clear aims statement – Importance and relevance discussed		x	
Is a qualitative methodology appropriate? – Methods did not appear to interpret the actions of research participants		x	

Appropriate research design			
QUESTION	YES	UNSURE	NO
Was the research design appropriate to address the aims of the research? – Researchers did not justify the research design			x

Sampling			
QUESTION	YES	UNSURE	NO
Was the recruitment strategy appropriate to the aims of the research? - Researchers explained how the participants were selected – Researchers explained why the participants selected were the most appropriate to provide access to the type of knowledge sought by the study	x		

Data collection			
QUESTION	YES	UNSURE	NO
Were the data collected in a way that addressed the research issue? – The setting for data collection was justified – It is clear how data were collected – Researchers made the methods explicit	x		

Reflexivity (research partnership relations/recognition of researcher bias)			
QUESTION	YES	UNSURE	NO
Has the relationship between researcher and participants been adequately considered? - Role modifications led to an increased attention on educational aspects of program	x		

Ethical Issues			
QUESTION	YES	UNSURE	NO
Have ethical issues been taken into consideration? – There are sufficient details of how the research was explained to participants for the reader to assess whether ethical standards were maintained	x		

Analysis			
QUESTION	YES	UNSURE	NO
Was the data analysis sufficiently rigorous? – No in-depth description of the analysis process - Researchers did not explain how the data presented were selected from the original sample to demonstrate the analysis process - Researchers acknowledged limitations of analysis			x

Findings			
QUESTION	YES	UNSURE	NO
Is there a clear statement of findings? – The findings are explicit – The findings are discussed in relation to the original research questions	x		

Value of the research			
QUESTION	YES	UNSURE	NO
How valuable is the research? – The researchers discuss the success but does not extrapolate it outside the research region	x		

Argument			
QUESTION	YES	UNSURE	NO
Was the article persuasive?	x		

Appendix 1-002: Quality Checklist

ID Number: 002
Author/s: Bijal A. Balasubramanian, Sabrina M. Chase, Paul A. Nutting, Deborah J. Cohen, Pamela A. Ohman Strickland, Jesse C. Crosson, William L. Miller, Benjamin F. Crabtree,
Journal and year*: Annals of Family Medicine,* 2010
Article Title: Using Learning Teams for Reflective Adaptation (ULTRA): Insights From a Team-Based Change Management Strategy in Primary Care
Context and geographic focus: High Income, United States

Prescreening			
QUESTION	YES	UNSURE	NO
Was there a clear statement of the aims of the research? – Clear goal of the research – Importance and relevance of research stated	x		
Is a qualitative methodology appropriate? – Research attempts to identify behaviours	x		

Appropriate research design			
QUESTION	YES	UNSURE	NO
Was the research design appropriate to address the aims of the research? – Researchers justified the research design	x		

Sampling			
QUESTION	YES	UNSURE	NO
Was the recruitment strategy appropriate to the aims of the research? - No information on recruitment		x	

Data collection			
QUESTION	YES	UNSURE	NO
Were the data collected in a way that addressed the research issue? – Setting for data collection was justified – Clear how data were collected – Researchers justified the methods chosen – Researchers made methods explicit – Form of data is clear – Researchers discussed saturation of data	x		

Reflexivity (research partnership relations/recognition of researcher bias)			
QUESTION	YES	UNSURE	NO
Has the relationship between researcher and participants been adequately considered? – Researchers responded to events during the study and whether the considered the implications of any changes in the research design	x		

Ethical Issues			
QUESTION	YES	UNSURE	NO
Have ethical issues been taken into consideration?	x	x	

- Modified question when guideline results were not promising. Instead of revealing adherence, researchers used data to understand how guidelines could be implemented to be useful			

Analysis			
QUESTION	YES	UNSURE	NO
Was the data analysis sufficiently rigorous? - There is a detailed description of the analysis process - Utilized the immersion-crystallization approach – Researchers explained how the data presented were selected from the original sample to demonstrate the analysis process – Sufficient data are presented to support the findings	x		

Findings			
QUESTION	YES	UNSURE	NO
Is there a clear statement of findings? – Findings are explicit – Adequate discussion of the evidence both for and against the researcher's arguments – Findings are discussed in relation to the modified research questions	x		

Value of the research			
QUESTION	YES	UNSURE	NO
How valuable is the research? – Researchers discuss the contribution the study makes to existing knowledge or understanding – Researchers have discussed whether or how the findings can be transferred to other populations	x		

Argument			
QUESTION	YES	UNSURE	NO
Was the article persuasive?	x		

Appendix 1-003: Quality Checklist

ID Number: 003
Author/s: Marie-Jet Bekkers, Sharon A Simpson, Frank Dunstan, Kerry Hood, Monika Hare, John Evans, C Butler and the STAR study team
Journal and year: *BMC Family Practice*, 2010
Article Title: Enhancing the quality of antibiotic prescribing in Primary Care: Qualitative evaluation of a blended learning intervention
Context and Geographic focus: High Income, United Kingdom

Prescreening			
QUESTION	YES	UNSURE	NO
Was there a clear statement of the aims of the research? - No clear aim		x	
Is a qualitative methodology appropriate? -The research seeks to interpret perspectives and experiences of research participants	x		

Appropriate research design			
QUESTION	YES	UNSURE	NO
Was the research design appropriate to address the aims of the research? - The researchers have justified the research design	x		

Sampling			
QUESTION	YES	UNSURE	NO
Was the recruitment strategy appropriate to the aims of the research? - The researchers explained how the participants were selected – The researchers explained why the participants selected were the most appropriate to provide access to the type of knowledge sought by the study	x		

Data collection			
QUESTION	YES	UNSURE	NO
Were the data collected in a way that addressed the research issue? – It is clear how data were collected – The researchers made the methods explicit – The form of data is clear – The researchers discussed saturation of data	x		

Reflexivity (research partnership relations/recognition of researcher bias)			
QUESTION	YES	UNSURE	NO
Has the relationship between researcher and participants been adequately considered? - The relationship did not appear to be considered			x

Ethical Issues			
QUESTION	YES	UNSURE	NO
Have ethical issues been taken into consideration? – Approval has been sought from the ethics committee	x		

Analysis			
QUESTION	YES	UNSURE	NO
Was the data analysis sufficiently rigorous? – There is a description of the analysis process – Thematic analysis is used and categories/themes were derived from the data – Enough data are presented to support the findings – The researchers critically examined their own role, potential bias and influence during analysis and had multiple code and analyse	x		

Findings			
QUESTION	YES	UNSURE	NO
Is there a clear statement of findings? – The findings are explicit – The researchers discussed the credibility of their findings – The findings are discussed in relation to the original research questions - Presented findings contrary findings	x		

Value of the research			
QUESTION	YES	UNSURE	NO
How valuable is the research? – The researchers discuss the contribution the study makes to existing knowledge – Situated research within current literature	x		

Argument			
QUESTION	YES	UNSURE	NO
Was the article persuasive?	x		

Appendix 1-004: Quality Checklist

ID Number: 004
Author/s: Kerem Shuval, Aviv Shachak, Shai Linn, Mayer Brezis,, Paula Feder-Bubis, Shmuel Reis
Journal and year: *Society of General Internal Medicine*, 2007
Article Title: The Impact of an Evidence-Based Medicine Educational Intervention on Primary Care Physicians: A Qualitative Study
Context and Geographic focus: High Income, Israel

Prescreening			
QUESTION	YES	UNSURE	NO
Was there a clear statement of the aims of the research? – Clearly outlined aims – Relevance discussed	x		
Is a qualitative methodology appropriate? – The research seeks to illuminate the actions and experiences of research participants	x		

Appropriate research design			
QUESTION	YES	UNSURE	NO
Was the research design appropriate to address the aims of the research? – Qualitative component of design was justified – Researchers justified the research design	x		

Sampling			
QUESTION	YES	UNSURE	NO
Was the recruitment strategy appropriate to the aims of the research? - Researchers explained how the participants were selected - Purposive sampling is appropriate	x		

Data collection			
QUESTION	YES	UNSURE	NO
Were the data collected in a way that addressed the research issue? – It is clear how data were collected, methods were clearly outlined – The researchers justified the methods chosen – Methods were modified during the study to allow for improved collection of data. Explained by researchers – The form of data is clear	x		

Reflexivity (research partnership relations/recognition of researcher bias)			
QUESTION	YES	UNSURE	NO
Has the relationship between researcher and participants been adequately considered? - No information on relationship		x	

Ethical Issues			
QUESTION	YES	UNSURE	NO
Have ethical issues been taken into consideration?	x		

– Approval has been sought from the ethics committee			

Analysis			
QUESTION	YES	UNSURE	NO
Was the data analysis sufficiently rigorous? – In-depth description of the analysis process – Themes emerged from the data – The researchers explained how the data presented were selected from the original sample to demonstrate the analysis process – Sufficient data are presented to support the findings – Data was agreed upon by two researchers, independently examining the work and discussing analysis when interpretations differed	x		

Findings			
QUESTION	YES	UNSURE	NO
Is there a clear statement of findings? – Findings are explicit – There is adequate discussion of the evidence both for and against the researchers' arguments – The findings are discussed in relation to the original research questions	x		

Value of the research			
QUESTION	YES	UNSURE	NO
How valuable is the research? – Research contributes to knowledge or understanding of topic – New areas for research are identified	x		

Argument			
QUESTION	YES	UNSURE	NO
Was the article persuasive?	x		

Appendix 1-005: Quality Checklist

ID Number: 005
Author/s: Janet Bradley and Susan Igras
Journal and year: *International Journal for Quality in Health Care,* 2005
Article Title: Improving the quality of child health services: participatory action by providers
Context and Geographic focus: Low/Middle-Income, Guinea and Kenya

Prescreening			
QUESTION	YES	UNSURE	NO
Was there a clear statement of the aims of the research? – Objective stated in abstract, hypothesis stated in study – Importance justified	x		
Is a qualitative methodology appropriate? – The research seeks to reveal attitudes and perceptions	x		

Appropriate research design			
QUESTION	YES	UNSURE	NO
Was the research design appropriate to address the aims of the research? – Researchers justified the research design	x		

Sampling			
QUESTION	YES	UNSURE	NO
Was the recruitment strategy appropriate to the aims of the research? - Researchers explained how the participants were selected – Researchers explained why the participants selected were the most appropriate to provide access to the type of knowledge sought by the study	x		

Data collection			
QUESTION	YES	UNSURE	NO
Were the data collected in a way that addressed the research issue? – Data collection was justified – Clear how data were collected – Researchers justified the methods chosen – Researchers made the methods explicit	x		

Reflexivity (research partnership relations/recognition of researcher bias)			
QUESTION	YES	UNSURE	NO
Has the relationship between researcher and participants been adequately considered? – No information on relationship		x	

Ethical Issues			
QUESTION	YES	UNSURE	NO
Have ethical issues been taken into consideration? - No information on ethical issues			x

Analysis			
QUESTION	YES	UNSURE	NO

Was the data analysis sufficiently rigorous? – No information on qualitative analysis process		x	

Findings			
QUESTION	YES	UNSURE	NO
Is there a clear statement of findings? – Findings are explicit – Findings are discussed in relation to the original research questions	x		

Value of the research			
QUESTION	YES	UNSURE	NO
How valuable is the research? – Researchers discuss the contribution the study makes to existing knowledge – Suggests further research	x		

Argument			
QUESTION	YES	UNSURE	NO
Was the article persuasive?	x		

Appendix 1-006: Quality Checklist

ID Number: 006
Author/s: Jeffery N. Epstein, Joshua M. Langberg, Philip K. Lichtenstein, Beth A. Mainwaring, Carolyn P. Luzader and Lori J. Stark
Journal and year: *Pediatrics*, 2008
Article Title: Community-wide Intervention to Improve the Attention-Deficit/Hyperactivity Disorder Assessment and Treatment Practices of Community Physicians
Context and Geographic focus: High Income, United States

Prescreening			
QUESTION	YES	UNSURE	NO
Was there a clear statement of the aims of the research? – Research goals were clearly stated – Importance of study was justified, gap in the research	x		
Is a qualitative methodology appropriate? – The research sought to illuminate the actions experiences of research participants	x		

Appropriate research design			
QUESTION	YES	UNSURE	NO
Was the research design appropriate to address the aims of the research? – Research design was appropriate, although would have benefited from a greater emphasis on qualitative research	x		

Sampling			
QUESTION	YES	UNSURE	NO
Was the recruitment strategy appropriate to the aims of the research? - Recruitment strategy was explained, detailing how the participants were selected - Participants were voluntary this may not be reflective of health worker population	x		

Data collection			
QUESTION	YES	UNSURE	NO
Were the data collected in a way that addressed the research issue? – Very clear how data were collected – Researchers detailed the methods chosen – The form of data is clear	x		

Reflexivity (research partnership relations/recognition of researcher bias)			
QUESTION	YES	UNSURE	NO
Has the relationship between researcher and participants been adequately considered? – No information on relationship		x	

Ethical Issues			
QUESTION	YES	UNSURE	NO
Have ethical issues been taken into consideration?		x	

– No information on ethical issues			

Analysis			
QUESTION	YES	UNSURE	NO
Was the data analysis sufficiently rigorous? – No discussion of the analysis process – Sufficient data presented to support the findings		x	

Findings			
QUESTION	YES	UNSURE	NO
Is there a clear statement of findings? – Findings are explicit – The findings are discussed in relation to the original research questions	x		

Value of the research			
QUESTION	YES	UNSURE	NO
How valuable is the research? - Researchers discuss the contribution the study makes to existing knowledge - Outlined new areas where research is necessary – Discussed further studies which would also transfering findings to other populations	x		

Argument			
QUESTION	YES	UNSURE	NO
Was the article persuasive?	x		

Appendix 1-007: Quality Checklist

ID Number: 007
Author/s Elwyn, G. Williams, M. Roberts, C. Newcombe, R.G. Vincent, J.
Journal and year: *Quality in Health Care*, 2008
Article Title: Case management by nurses in primary care: analysis of 73 'success stories'
Context and Geographic focus: High Income, United Kingdom

Prescreening			
QUESTION	YES	UNSURE	NO
Was there a clear statement of the aims of the research? – Clear goal of the research	x		
Is a qualitative methodology appropriate? – Research seeks to interpret the actions and experiences of research participants	x		

Appropriate research design			
QUESTION	YES	UNSURE	NO
Was the research design appropriate to address the aims of the research? – The researchers justified the research design	x		

Sampling			
QUESTION	YES	UNSURE	NO
Was the recruitment strategy appropriate to the aims of the research? - The researchers explained how the participants were selected and the recruitment process - Discussion around recruitment, listed as a limitation	x		

Data collection			
QUESTION	YES	UNSURE	NO
Were the data collected in a way that addressed the research issue? – It is clear how data were collected – Data collection methods explicit – The form of data is clear	x		

Reflexivity (research partnership relations/recognition of researcher bias)			
QUESTION	YES	UNSURE	NO
Has the relationship between researcher and participants been adequately considered? - Unable to determine if relationship was considered		x	

Ethical Issues			
QUESTION	YES	UNSURE	NO
Have ethical issues been taken into consideration? – Ethical procedures seem to be in place	x		

Analysis			
QUESTION	YES	UNSURE	NO
Was the data analysis sufficiently rigorous? – In-depth description of the analysis process listed	x		

– Thematic analysis is used, it is clear how categories/themes were derived – Researchers explain how the data presented were selected from the original sample to demonstrate the analysis process – Sufficient data are presented to support the findings			

Findings			
QUESTION	YES	UNSURE	NO
Is there a clear statement of findings? – The findings are explicit – There is much discussion of the evidence both for and against the researcher's arguments – Researchers acknowledge reporting bias which may affect findings – The findings are discussed in relation to the original research questions	x		

Value of the research			
QUESTION	YES	UNSURE	NO
How valuable is the research? – The researchers discusses the contribution the study makes to existing knowledge or understanding – New areas where research is necessary are identified	x		

Argument			
QUESTION	YES	UNSURE	NO
Was the article persuasive?	x		

Appendix 1-008: Quality Checklist

ID Number: 008
Author/s: Susan R Kirsh, Renée H Lawrence, and David C Aron
Journal and year: *Implementation Science*, 2008
Article Title: Tailoring an intervention to the context and system redesign related to the intervention: A case study of implementing shared medical appointments for diabetes
Context and Geographic focus: High Income, United States

Prescreening			
QUESTION	YES	UNSURE	NO
Was there a clear statement of the aims of the research? - Importance discussed, relevance not so much - Clearly stated aim	x		
Is a qualitative methodology appropriate? - Qualitative methodology appropriate	x		

Appropriate research design			
QUESTION	YES	UNSURE	NO
Was the research design appropriate to address the aims of the research? - Case analysis appropriate but not justified	x		

Sampling			
QUESTION	YES	UNSURE	NO
Was the recruitment strategy appropriate to the aims of the research? - Recruitment not discussed		x	

Data collection			
QUESTION	YES	UNSURE	NO
Were the data collected in a way that addressed the research issue? - Data collection not justified - Unclear methods - Unjustified methods - Unclear methods - Unclear form of data collection		x	

Reflexivity (research partnership relations/recognition of researcher bias)			
QUESTION	YES	UNSURE	NO
Has the relationship between researcher and participants been adequately considered? - Bias not apparent, research was triangulated	x		

Ethical Issues			
QUESTION	YES	UNSURE	NO
Have ethical issues been taken into consideration? - Retrospective study - Interactions clearly outlined - All authors work at place of evaluation	x		

Analysis			
QUESTION	YES	UNSURE	NO
Was the data analysis sufficiently rigorous? - Description of grounded theory analysis process - Multiple evaluators suggest sufficient rigour	x		

Findings			
QUESTION	YES	UNSURE	NO
Is there a clear statement of findings? - Findings clearly outlined in a table - Sufficient discussion and explanation	x		

Value of the research			
QUESTION	YES	UNSURE	NO
How valuable is the research? - Research assisted in closing a gap - Outlines new areas for research - Acknowledged the local context, but more about tailoring interventions to specific contexts	x		

Argument			
QUESTION	YES	UNSURE	NO
Was the article persuasive?	x		

Appendix 1-009: Quality Checklist

ID Number: 009
Author/s: Rebecca Olbort, Cornelia Mahler, Stephen Campbell, Bernd Reuschenbach, Thomas Muller-Tasch, Joachim Szecsenyi & Frank Peters-Klimm
Journal and year: *Journal of Advanced Nursing*, 2008
Article Title: Doctors' assistants' views of case management to improve chronic heart failure care in general practice: a qualitative study
Context and Geographic focus: High Income, Germany

Prescreening			
QUESTION	YES	UNSURE	NO
Was there a clear statement of the aims of the research? – Clear goal of the research – Relevance stated	x		
Is a qualitative methodology appropriate? – The research interpreted experiences of research participants	x		

Appropriate research design			
QUESTION	YES	UNSURE	NO
Was the research design appropriate to address the aims of the research? – The researchers justified the research design	x		

Sampling			
QUESTION	YES	UNSURE	NO
Was the recruitment strategy appropriate to the aims of the research? - Researchers explained how the participants were selected	x		

Data collection			
QUESTION	YES	UNSURE	NO
Were the data collected in a way that addressed the research issue? – The setting for data collection was justified – It is clear how data were collected – Researchers discussed methods – The form of data is clear	x		

Reflexivity (research partnership relations/recognition of researcher bias)			
QUESTION	YES	UNSURE	NO
Has the relationship between researcher and participants been adequately considered? - Did not appear to consider relationship			x

Ethical Issues			
QUESTION	YES	UNSURE	NO
Have ethical issues been taken into consideration? – Approval was sought from the ethics committee	x		

Analysis			
QUESTION	YES	UNSURE	NO
Was the data analysis sufficiently rigorous? – Description of the analysis process	x		

– Inductive content analysis is used. - Researchers explained how the data presented were selected from the original sample to demonstrate the analysis process – Sufficient data was presented to support the findings			

Findings			
QUESTION	YES	UNSURE	NO
Is there a clear statement of findings? – Findings are explicit – Much discussion of the evidence both for and against the researcher's arguments – Researchers discussed the credibility of their findings – Findings were discussed in relation to the original research questions	x		

Value of the research			
QUESTION	YES	UNSURE	NO
How valuable is the research? – Researchers discussed the contribution the study makes to existing knowledge or understanding – Researchers discussed whether or how the findings can be transferred to other populations or considered other ways the research may be used	x		

Argument			
QUESTION	YES	UNSURE	NO
Was the article persuasive?	x		

Appendix 1-010: Quality Checklist

ID Number: 010
Author/s: Lisa V. Rubenstein, Louise E. Parker, Lisa S. Meredith, Andrea Altschuler, Emmeline de Pillis, John Hernandez, and Nancy P. Gordon
Journal and year: *Health Services Research*, 2002
Article Title: Understanding Team-based Quality Improvement for Depression in Primary Care
Context and Geographic focus: High Income, United States

Prescreening			
QUESTION	YES	UNSURE	NO
Was there a clear statement of the aims of the research? – The goal of the research was outlined – Importance of researched was outlined – Relevance of research was outlined	x		
Is a qualitative methodology appropriate? – The research seeks to illuminate the actions and experiences of research participants	x		

Appropriate research design			
QUESTION	YES	UNSURE	NO
Was the research design appropriate to address the aims of the research? – The researchers justified the research design – Detailed design outlined	x		

Sampling			
QUESTION	YES	UNSURE	NO
Was the recruitment strategy appropriate to the aims of the research? - The researchers explained how the managed care facilities were selected	x		

Data collection			
QUESTION	YES	UNSURE	NO
Were the data collected in a way that addressed the research issue? – It is clear how data were collected – Researchers justified the methods chosen – Researchers made the methods explicit	x		

Reflexivity (research partnership relations/recognition of researcher bias)			
QUESTION	YES	UNSURE	NO
Has the relationship between researcher and participants been adequately considered? - Researchers considered data collection, including sample recruitment and choice of location – Researchers responded to events during the study and whether they considered the implications of any changes in the research design		x	

Ethical Issues			
QUESTION	YES	UNSURE	NO
Have ethical issues been taken into consideration?	x		

– Managed care facilities all agreed to participate			

Analysis			
QUESTION	YES	UNSURE	NO
Was the data analysis sufficiently rigorous? – Sufficient data was presented to support the findings – Contradictory data was taken into account – Limited qualitative analysis	x		

Findings			
QUESTION	YES	UNSURE	NO
Is there a clear statement of findings? – Findings are explicit – Discussion of the evidence both for and against the researchers' arguments - Findings were discussed in relation to the literature review – Findings were discussed in relation to the original research questions	x		

Value of the research			
QUESTION	YES	UNSURE	NO
How valuable is the research? – Findings cannot be transferred to other populations	x		

Argument			
QUESTION	YES	UNSURE	NO
Was the article persuasive?	x		

Appendix 1-011: Quality Checklist

ID Number: 011
Author/s: Sennun P, Suwannapong N, Howteerakul N, Pacheun O.
Journal and year: *Rural and Remote Health*, 2006
Article Title: Participatory supervision model: building health promotion capacity among health officers and the community
Context and Geographic focus: Low/Middle Income, Thailand

Prescreening			
QUESTION	YES	UNSURE	NO
Was there a clear statement of the aims of the research? – Goal of the research clear - Relevance stated	x		
Is a qualitative methodology appropriate? – Seeks to understand health officer and community involvement	x		

Appropriate research design			
QUESTION	YES	UNSURE	NO
Was the research design appropriate to address the aims of the research? – Researchers justified the quasi-experimental research design	x		

Sampling			
QUESTION	YES	UNSURE	NO
Was the recruitment strategy appropriate to the aims of the research? - Researchers explained in detail how the participants were selected – Researchers explained why the participants selected were the most appropriate	x		

Data collection			
QUESTION	YES	UNSURE	NO
Were the data collected in a way that addressed the research issue? – Setting for data collection was discussed – It is clear how data were collected – Researchers justified the methods chosen – Researchers made the methods explicit – The forms of data are clear	x		

Reflexivity (research partnership relations/recognition of researcher bias)			
QUESTION	YES	UNSURE	NO
Has the relationship between researcher and participants been adequately considered? - No information on relationship		x	

Ethical Issues			
QUESTION	YES	UNSURE	NO
Have ethical issues been taken into consideration? – Sufficient details of how the research was explained to participants for the reader to assess whether ethical standards were maintained	x		

- Researchers discussed issues raised in the study - Selection bias: health officers and supervisors selected for meeting minimum requirements			

Analysis			
QUESTION	YES	UNSURE	NO
Was the data analysis sufficiently rigorous? – Basic description outlined the analysis process – Thematic analysis was used, but how the categories/themes were derived was unclear – Multiple reviewers to triangulate data	x		

Findings			
QUESTION	YES	UNSURE	NO
Is there a clear statement of findings? – The findings were explicit – The researchers discussed the credibility of their findings – The findings were discussed in relation to the original research questions	x		

Value of the research			
QUESTION	YES	UNSURE	NO
How valuable is the research? - Researchers identify new areas where research is necessary – Does not discuss if the findings can be transferred to other populations or considered other ways the research may be used	x		

Argument			
QUESTION	YES	UNSURE	NO
Was the article persuasive?	x		

Appendix 2: Article Summary Form

ID Number:
Author/s:
Journal and year:
Article Title:
Context/Geographic focus:

THE STUDY
Aims:
Methods:
Strengths and limitations:

INTERVENTION
Intervention details:
Evidence of Impact:
Influence of implementation:
Influence over impact:

DATA
Findings:

Appendix 2-001: Article Summary

ID Number: 001
Author/s: Catherine Antoline, Amy Kramer, Mark Roth
Journal and year: The Permenentre Journal, 2011
Article Title: Implementation and Methodology of a Multidisciplinary Disease-State-Management Program for Comprehensive Diabetes Care
Context and Geographic focus: High Income, United States

THE STUDY
Aims:
- Improve the 2009 comprehensive DM-care Healthcare Effectiveness Data and Information Set results to at least the 75th percentile with the intention to improve overall patient health.
Methods:
- Chart reviews, telephonic interviews
Study limitations:
- Article did not follow a typical article structure, thus it was difficult to seek out certain information

INTERVENTION
Intervention details:
- Diabetes management program for DM patients aged 18-80, with goals to increase The Healthcare Effectiveness Data and Information Set scores to 75th and improve overall patient health.
Evidence of Impact:
- Healthcare Effectiveness Data and Information Set scores decreased, DM disease management integrated into daily work flows; disease-state management has expanded to include hypertension, coronary artery disease, chronic obstructive pulmonary disease, and asthma.
Influence of implementation:
- Executive leadership in existing quality-improvement team

DATA
Findings:
Main contributors to the success of the program included executive support and sponsorship, the leadership and composition of the ACM committee, systematic identification and assignment of patients, the LPN-run blood-pressure clinic, continuous education efforts, dedicated panel-management time, use of a multidisciplinary team, and expansion of treatment of patients with DM beyond glucose control to include blood-pressure and lipid-level management. Patient panel assignments to care managers helped create accountability for the total patient population and their care gaps. However, no system was in place to generate care-manager-specific outcome and productivity data reports. In addition, as seen in Table 3, although patient workload distribution was clearly structured, problems arose when PCP referrals deviated from the established work flow. These deviations occurred when PCPs were learning the new work flow or were more comfortable with their prior in-office referral processes. The LPN-run blood-pressure clinic increased access to screening without a copay. Increased blood-pressure measurement opportunities enabled a more rapid medication-titration process. Also, the adoption of a strictly LPN-run clinic freed time in the RNCM schedule to engage in disease management.

Because many shifts in roles had occurred and a new process was being implemented, a strong emphasis was placed on education of the entire disease-state-management team. These efforts were repeated in multiple forums and venues. Algorithms, national guidelines, and standards of care were distributed and reviewed at physician, pharmacist, and RNCM team meetings on an ongoing basis. These concepts were again reviewed at interdisciplinary team meetings. Patients were also educated through group diabetes classes led by either a member of the PCM team or an RNCM and registered dietitian. Classes addressed diet and lifestyle changes, medication management, and disease-state progression.

Panel-management time assisted in gaining physician buy-in and reduced the burden of increased DM-related in-basket messages. Although over time, it was found that panel-management time was not always strictly used for DM disease-state management, it did consistently allow physicians to feel more comfortable with integrating more disease management into their daily work flow.

One of the components most important to the improvement in HEDIS measures and patient care came from the strategy of treating all parameters of the patient with DM. Before the initiation of this program, less emphasis was placed on the control of blood pressure and lipid levels in patients with DM; care centered on lowering blood-glucose levels. With the use of the ALL mnemonic, emphasis shifted from a glucose-centered approach to one that started and titrated all applicable medications to reach comprehensive diabetic goals. However, as a consequence of the focused effort on diabetes care in 2008, less focus was placed on several other chronic diseases. Thus, not all 2009 HEDIS measures showed as large of an improvement as the DM related measures.

Despite the improvement seen in diabetes care, several limitations to this analysis exist. First, no demographic data for the cohort were available for collection. Therefore, it is unclear what role changing demographics might have had on the reported results. KPOH is currently implementing a process for demographic data collection. Second, the goal of this article was to describe the efforts and results of a multidis-ciplinary disease-state-management team, not to analyze cost savings or financial implications of such an intervention. Although we do believe that a strong DM-management program does decrease long-term health care costs, this hypothesis cannot be validated by the current analysis. It is possible that because of increased screening, medication dispensing, and DM-related office visits, short-term costs may have increased in the KPOH region, but those data were not analyzed.

Because of the success of this program, DM disease management has been integrated into daily work flows. In addition, the multidisci-plinary approach to disease-state management has expanded to include hypertension, coronary artery disease, chronic obstructive pulmonary disease, and asthma. Increased teamwork has led to improved communication between departments and a greater understanding of each discipline's strengths.
The opportunity to provide more effective diabetes care has fostered a personal connection and sense of increased job satisfaction, although no employee surveys were administered to validate these findings.

Appendix 2-002: Article Summary

ID Number: 002
Author/s: Bijal A. Balasubramanian, Sabrina M. Chase, Paul A. Nutting, Deborah J. Cohen, Pamela A. Ohman Strickland, Jesse C. Crosson, William L. Miller, Benjamin F. Crabtree,
Journal and year: *Annals of Family Medicine*, 2010
Article Title: Using Learning Teams for Reflective Adaptation (ULTRA): Insights From a Team-Based Change Management Strategy in Primary Care
Context and geographic focus: High Income, United States

THE STUDY
Aims:
- Whether and how primary care practices could implement and sustain a team-based collaborative change management strategy - How practice improvement teams identified and addressed important practice change issues.
Methods:
- Observation, key informant in-depth interviews, descriptive field notes, practice summary reports
Study limitations:
- Limited reporting on results

INTERVENTION
Intervention details:
- Reflective adaptive process teams as a change management strategy for primary care, with goals to enhance communication and decision making to improve adherence to multiple clinical guideline
Evidence of Impact:
- Improved communication amongst practice staff
Influence of implementation:
- Duel hierarchy complicated implementation. Support staff eager to implement but often silenced by physicians or clinicians in power.

DATA
Findings:
Engagement in a Team-Based Collaborative Change Management Strategy Despite this lack of meeting history, 18 out of 25 intervention practices were successfully able to convene RAP teams, identifying and addressing potential areas of improvement. These practices each held at least 10 RAP meetings with regular attendance by members representing different parts of the practice and collaborated in brainstorming, planning, and implementing change. For example, in practice 58, the RAP team addressed the problem of missing patient charts. To address this problem, they tracked chart pathways through their office, drawing on cross-practice representatives to understand the reasons for pulling and transporting charts. Using this information, the team piloted strategies for eliminating "hot spots" of temporary chart loss and changing how charts were handled. In practice 47, the RAP team addressed the issue of keeping physicians on schedule to reduce patient wait time. The RAP team worked together to create a dialogue between team members and physicians who were not on the team. By doing so, they were able to surface and address unacknowledged tensions that had plagued the practice for some time. Seven practices (of 25) were unsuccessful at engaging in the RAP process. In each case, a key leader, primarily the physician member dominated the meeting agenda. In 3 practices, lead physicians or office managers refused to relinquish control of the meeting agenda by directing conversation or shutting down critical areas of reflection. For example, in practice 34, the lead

physician and office manager operated as a faction, working together to shut down topics they disliked and preserve their control of the agenda. Other team members attempting to introduce discussion of practice problems eventually gave up in the face of this tag team opposition. In practice 14, the lead physician publicly supported RAP to the research team, but in private, resisted it, first attempting to withdraw and later subverting discussion. Consequently, the team could not function effectively despite the support of the office manager.

Staff hesitance to speak in presence of practice leaders out of a concern of not being taken seriously or fear of belittlement was another factor in practices' being unsuccessful at engaging in RAP. For example, in practice 35 when staff shared an experience of "...[and] I get flustered," the office manager responded with, "Yeah, you do. You really do." This reinforced the notion that the practice's problems were the fault of the staff rather than systemic issues to be addressed by the team as a whole. Team members learned quickly and stopped talking; thus, lack of safety became a barrier to staff participation in the change process. In practice 42, team members were reluctant to speak. When the facilitator questioned the team about their reticence, only a single person replied, saying that she spoke up in RAP meetings because "others are afraid to...they fear retaliation if they go against [the doctor's] vision of how things should be or if they are critical."

In 2 practices there was only superficial support from physician leaders. For example, practice 15 had only 4 RAP meetings at which time the office manager mentioned that they had accomplished their goals. Also, the physician leader was absent for 3 of these meetings. Thus, the practice RAP team went through the motions of implementing the intervention, but only superficially.

All 18 practices that engaged in RAP were able to identify improvement targets and make changes. Furthermore, 8 of these 18 practices continued using RAP in some form through the 2-year follow-up data collection point. Most practices that sustained the intervention were at a turning point when RAP was introduced. They used the intervention to organize themselves and, with time, found theprocess valuable in problem solving and decision making. For example, in practice 17, 1 physician was buying out the practice at the time that RAP was introduced. This physician leader wassupportive of the group process and cognizant that her involvement should not "stifle the conversation." Also, 2 years after the intervention ended, practice members saw value in continuing to meet, as noted in the following quotes: "This helped us learn how to communicate better," "this was empowering," "meetings helped teach us how to problem solve," and "I learned to stop and understand the process." Practices that sustained the intervention often adjusted the structure and format of RAP meetings by adapting the process to their own specific needs. For example, practice 10 introduced a process of rotating RAP team members every 4 to 5 months to ensure that all members of the practice would be represented. Practice 17 transitioned its RAP meetings into separate physician and staff meetings but continued to incorporate elements of the process to preserve practice-wide involvement in problem solving.

There was evidence of changes in practice-wide communication after the intervention. In 12 of the 18 practices that had engaged in the RAP process, 1 or more practice members reported improvements in practice-wide communication as a result of RAP. Members of practices in which lead physicians remained engaged in RAP and encouraged discussions were especially likely to report improvements in communication. For example, throughout the RAP process in practice 39, the lead physician encouraged discussion, inviting new ideas and refocusing the group whenever conversations strayed too far from the problem at hand. The team eventually expanded to include staff from a second office that had recently been purchased by the lead physician. When asked about the value of RAP meetings, the lead physician explained that,

...meeting once a week has made our practice run so much smoother. We were having problems a year ago between the offices, but they've almost disappeared now. We make sure that new people always come to the meetings right away. They make people better at teamwork. This fosters collaboration. We use it to get a lot accomplished.

Practice Change Issues Addressed by RAP Teams

The range of improvement targets on which RAP teams chose to work are described in the Table 1. Interestingly, not a single practice focused on improving adherence to clinical care guidelines. Most practices targeted patient care–related issues (eg, improving charting or access to practice) or practice-level organizational improvements (eg, easing staffing issues, leadership, or cross-practice communication). All teams were able to generate lists of their core issues and subsequently address 1 or more of them, although not all issues were resolved. For example, the RAP team at practice 17 noted that communication around the issue of prescription refills was a persistent problem. First, the team diagrammed the prescription refill process by observing it in real time and collecting data to assess where the process broke down. The team then concluded that patient telephone messages requesting prescription refills were often unclear, missing dosages or misspelling drug names. As a result staff members spent precious time trying to contact the patient or his/ her physician to obtain detailed and accurate information. To address this problem, the team pilot-tested potential solutions until they found a strategy that reduced the number of unclear prescription refill messages. They also designed a plan to continue measuring improvements every other month to find out whether the improvements were sustained with time. This practice used only 6 RAP meetings to complete their first improvement target. Subsequent RAP meetings were used to tackle other issues related to communication improvement and structural reorganization. The team continued to meet after the initial facilitated 12-week period, sustaining improvement activities over the entire 24-month observation period.

The number of improvement targets addressed during RAP meetings also varied considerably across practices. For instance, practice 39 identified new improvement targets at each meeting, brainstormed potential solutions, and pilot tested them during the ensuing week. Based on the outcomes of this testing, changes were implemented. This practice took on 2 to 3 new issues every week, and by the end of the 12-week process they made improvements in many areas. On the other hand, practice 17 took on 2 major practice-wide issues (communication improvement and structural reorganization) and used weekly RAP meetings to gradually plan incremental changes that were instituted throughout the practice and that led to improvements in both areas. In essence, practice 17 operated from a systems perspective, whereas practice 39 preferred to address problems as they emerged.

Appendix 2-003: Article Summary

ID Number: 003
Author/s: Marie-Jet Bekkers, Sharon A Simpson, Frank Dunstan, Kerry Hood, Monika Hare, John Evans, C Butler and the STAR study team
Journal and year: *BMC Family Practice,* 2010
Article Title: Enhancing the quality of antibiotic prescribing in Primary Care: Qualitative evaluation of a blended learning intervention
Context and Geographic focus: High Income, United Kingdom

THE STUDY
Aims:
- To determine whether clinicians' exposure to the STAR Educational Program results in fewer antibiotics being dispensed to the practice's patients during the year following completion of the intervention.
Methods:
- Semi-structured telephone interviews
Study limitations:
- Possible response bias - Recall bias and related issues as reporting took place long after intervention

INTERVENTION
Intervention details:
- Educational program for antibiotic prescribing practices, with goals to enhance the quality of antibiotic prescribing and raise awareness about antibiotic resistance among general medical practitioners. I
Evidence of Impact:
- Awareness of the antibiotic resistance issue (although many reported no impact)
Influence of implementation:
- Not available

DATA
Findings:

Evaluating the STAR Educational Program
Communication skills examples

In evaluating the contents of the program, rather than its reported effects, views were sometimes polarised. The presentation of key communication skills was described either in terms of new, useful and exciting, or as old and familiar, though perhaps in need of 'brushing up'. In either instance, however, implementing these skills was acknowledged as leading to better patient care and, ultimately, greater personal satisfaction:

I think the communication skills aspect was good, being able to ask patients what they feel about antibiotics and to have a more adult conversation about it ... it sort of encourages you not just to be defensive and [say] 'we don't want to prescribe' but be proactive ... asking the patients what they felt was the benefit of taking antibiotics and what did they think they were going to get out of it .... and sort of telling people it is a self-limiting illness, some of those skills I thought was very good and make it much easier to prescribe the way I'd like to. (GP 229)

The seminar

Respondents viewed the seminar as providing a much-needed 'human touch', although a small number of interviewees, especially those working in single-handed or very small practices, considered it a waste of time and money. Participation in the program seminar was also presented as a unique chance to focus on a particular issue and to increase communication within the practice team:

... the trouble is in general practice you don't have time to sit and talk and [it's] usually sort of a business practice meeting we don't often have clinical sort of where we actually discuss and necessarily change or discuss the pros and cons of various things on a regular basis. I'm not saying we don't ever talk about things at all, we communicate quite well, but it's finding the time to do it. (GP 161)

Seminar trainer feedback indicated that it proved difficult at times to gather all the trial participants from a particular practice at a particular time, with the absence of practice nurses, who are often in charge of minor illness (telephone) triage, especially commented upon. Overall, however, trainers described the seminar discussions as lively, with participants most eagerly engaged in discussing local resistance rates as correlated with own practice data.

The online training

The online aspect of the training was generally evaluated positively, with a particular emphasis on its promotion of independent learning and flexibility in accessing the program. However, six out of thirty-three practices experienced (initial) technical difficulties and especially in practices with older computer systems, or for clinicians less comfortable with IT, delays in video streaming and inability to access the program depending on certain computer settings could lead to frustration:

... there was a kind of pointlessness about the use of the technology, having video streaming that just made it irritatingly slow to download and it didn't contribute anything, and you'd actually watch a videotape of somebody *talking*, I would just as soon have *read* the text to be honest. (GP 171)

Finally, some participants found the video material lacking in authenticity:

... there was some amusement during the video consultation with the various patients and doctor scenarios because it all seemed to go so beautifully according to plan and the patients never

argued and there was lots of time and I thought - we all discussed that and we thought it was rather amusing, we didn't think it was totally realistic. (GP 207)

Research evidence and guidelines
The presentation of up-to-date evidence was generally seen as one of the most useful aspects of the STAR Program. Participants described how they discussed the modified Centor clinical scoring tool for managing sore throat, as well as the prescribing guidelines and evidence summaries with patients during consultations:

... you gave us guidelines on- primary care guidelines that have been very useful actually. Again, we've given our nurses copies of those to have a look at when they are seeing patients with minor illnesses. You know, I think no one has given them training in good antibiotic prescribing so I do think they over-prescribe, even though they're very good. I think those guidelines have been quite helpful, in fact we keep them pinned up by the uh, when they're doing nurse triage we keep them pinned up by the phone, so they can refer to those. (GP 248)

... the Centor guidelines, the other guidelines, can't remember what they were called now, the ones for the sinusitis and things you know, those I actually have them on my desktop. So what I do is I just put them on if I get someone stroppy ... just put them on and turn the screen and say 'read that, that's the guidelines we've got', because if you've given them an examination and you know they haven't got a temperature and they haven't many chest signs ... On the whole they tend to sort of 'oh okay' then, it's on the screen so it must be true and they see that's it's, you know, it's an official document. (GP 256)

As evident from seminar trainer feedback as well as interview data, and in line with the 'computer-says-no' scenario presented in the above data excerpt, STAR participants repeatedly requested antibiotic resistance information leaflets or posters that can be displayed in surgery waiting rooms. Interviewees noted that presentation of the research evidence and guidelines in this more generally accessible format could have provided them with an added tool, and they expected it to be part of the overall program.

Case studies and self-reflection
About a fifth of interviewees reported that they did not see the merits of the reflective exercises or recording their own consultations online:

I: ... and what did you think was the least useful

GP: I think finding my own cases to put in. I don't know there's plenty of cases you could have found. It was hard to find an interesting one. But in terms of looking at that it didn't really affect what I was doing in any way, it was just a bit time consuming. That was a bit of a chore. (GP152)

However, one of these participants, unprompted, addressed his own reservations on this issue, thereby aligning himself with the majority standpoint:

... the tasks of recording some of one's own consultations ... I don't know whether recording them had any benefit over simply thinking about them. Obviously recording them takes up a bit more time, but having said that I don't know if I didn't have to record them whether I'd really spend time ((laughs)) thinking about (those cases). It felt frustrating at some level but I'm well aware that that

sort of thing does actually improve one's processing of it. (GP216)

Overall evaluation of key STAR components

The core aspects of the STAR Program considered 'most useful' and reported by these sampled participants as responsible for influencing their prescribing most were the research evidence and guidelines provided in the program, and the online communication skills examples, both of which were explicitly mentioned by 12 of the 31 interviewees. Ten interviewees reported that their prescribing behaviour had changed because of the increased overall awareness of the antibiotic resistance issue that results from working through the program as a whole, with four of those singling out the impact of discussing local resistance rates during the STAR seminar.

In contrast, there were also respondents who considered the research evidence not directly relevant to their own clinical practice, or found it too difficult to process online. Moreover, the web forum, originally envisaged to become an ongoing learning resource, was dismissed by many as irrelevant, a format participants could not or would not engage with, even if their busy working lives would allow them time to do so.

However, it was clear that all interviewed study participants subscribed to the view summarised by GP 207 as follows:

... overall I think it's just the being better educated and having therefore more clinical expertise and [the] communication tools to prescribe appropriately, treat appropriately, and therefore give better patient care, which is the bottom line. (GP207)

Appendix 2-004: Article Summary

ID Number: 004
Author/s: Kerem Shuval, Aviv Shachak, Shai Linn, Mayer Brezis,, Paula Feder-Bubis, Shmuel Reis
Journal and year: *Society of General Internal Medicine*, 2007
Article Title: The Impact of an Evidence-Based Medicine Educational Intervention on Primary Care Physicians: A Qualitative Study
Context and Geographic focus: High Income, Israel

THE STUDY
Aims:
- Evaluate the impact of an EBM intervention on the knowledge, attitudes, and clinical behavior of course participants and facilitators and EBM perception and barriers/enablers to its implementation. - Examine whether an EBM educational intervention can enhance appropriate drug prescriptions and test ordering of intervention physicians in comparison to control physicians
Methods:
- Focus groups and interviews
Study limitations:
- Facilitators' perspective may be overrepresented in findings - Possible Hawthrone effect due to participation by primary care physicians

INTERVENTION
Intervention details:
- Evidence-based medicine educational intervention with goals of evaluating the impact of said intervention on the knowledge, attitudes, and clinical behavior of participating physicians and patients
Evidence of Impact:
- Positively influenced attitudes and knowledge
Influence of implementation:
- HMO incentives for better quality of care

DATA
Findings:
Perceived Barriers and Enablers to Implementing EBM at the Point of Care Facilitators and participants perceived barriers to implemen- ting EBM at the point of care were time constraints, work overload, a busy urban setting, and patients demanding redundant treatment (F#4): " I have 60 people in the waiting room...I'm not going to give a patient a long lecture on why it's no longer necessary to treat every Streptococcus with an antibiotic. It takes much more time to explain EBM than to simply write out a prescription." Moreover, PCPs perceived constantly changing evidence as hindering the practice of EBM. Physicians felt that frequent changes in treatment recommendations as a result of new evidence created uncertainty for patients and physicians alike (F#10): "We regard the results of randomized control trials as the absolute truth. But the 'truth' keeps on changing. Look at Beta-Blockers or Hormonal Replacement Therapy...These ever- changing recommendations are really hard for my patients and I to swallow...It was a lot easier back then when medicine was based on instinct and experience." Additional barriers consisted of textbooks bereft of EBM jargon, physicians' scant computer and information retrieval skills, and slow computers. A number of participants felt the doctor's

advanced age to be a barrier to understanding EBM concepts and utilizing online EBM resources (P#18): “I’m 59 years old. You can’t compare me with them (young physicians)... I don’t think as fast as I used too; I’m not as capable with the computer either... After the first session I was really devastated... I went home and cried.”

Enabling factors included the ease of use of medication databases and HMO incentives for better quality of care (F#5): “Doctors should be rewarded for practicing better medicine, and EBM is an integral part of that... I think financial incentives would make a real difference... Today there’s no real reward ...nothing... zilch.” Participants noted that aca- demic teaching and writing clinical guidelines necessitates continual learning and keeping up to date with the latest evidence (P#21): “I teach residents... I don’t want to be caught unprepared if a resident asks me about my opinion regarding a paper that was just published.”

Physicians recommended both personal and organizational strategies to overcome these barriers. Personal strategies consisted of constantly keeping up-to date (via medical journals and email services), meeting regularly with a col- league experienced in information retrieval and jointly search- ing for answers to clinical questions, leaving medication databases open during consultation, and using patient hand- outs. The main organizational strategies suggested include providing decision support services, assisting in “real time” decision making and decision support systems (P#23): “It would be very helpful if there was a support service I could call to ask questions... I wouldn’t feel like I’m imposing myself and taking up the specialist’s time”; (F#9): “There might be information overload using a decision support system, but it’s more realistic and less time consuming than looking for the information myself.” Other suggested strategies included: annual EBM knowledge exams and quality of care monitoring, regular staff meetings in primary care clinics, and journal clubs.

The Effect of the Intervention on Attitudes, Perceived Knowledge, and Behavior
Facilitators’ Perceptions of Changes in Themselves. Most facilitators found that teaching the course enhanced their own knowledge and skills; however, opinions differed regarding the impact on behavior. Some felt that their improved information retrieval skills influenced their ability to access EBM resources at the point of care (F#9): “Clinical questions that took me hours at night became 5-minute tasks done during the encounter. It’s a major difference.” But others noted the intervention had little impact on their ability to utilize pre- appraised resources and believed the intervention had missed the mark (F#5): “If the aim of the intervention was that while sitting with a patient I’ll be able to punch in a question and retrieve information within minutes, well we’ve failed. It just won’t happen”. Integrating EBM at the point of care was seen as more feasible through writing down clinical questions, and later, searching for them at home (F#3):“I can’t do much when the patient is present, but I’m able to write down questions which I later search for at home. At our subsequent meeting, I bring printed material and show it to them. This helps.”

Facilitators’ Perceptions of Changes in Participants. Facilitators believed the intervention affected their students’ attitudes, empowered them, improved their computer and EBM skills, but doubted the impact on their behavior (F#2): “Do I fantasize that the intervention influenced my students’ decision making? Unfortunately, no.” Others felt behavioral changes won’t be detected by examining (F#5) “test referral and drug prescription rates before and after the intervention,” but rather, by examining micro-changes (F#6):“ I taught them how to take text out of journal articles and paste it in their patients’ charts...These facets made EBM come to life in their daily practice.” A number of facilitators noted that the intervention’s effect depended on the initial knowledge of trainees (F#10): “The course really made a difference to those who had studied EBM in family medicine residency... Doctors lacking the baseline knowledge had a difficult time.”

Participants’ Perceptions of Changes in Themselves. In contrast to facilitators’ perceptions of trainees, most participants believed the intervention had an impact not only on their attitudes and skills, but on their behavior as well. Trainees claimed their ability to retrieve information improved and reported using EBM resources more frequently (P#23): “Before I used to search for medical information unsystematically. Today I’m more equipped to go online and know where to look for

relevant information." In addition, participants reported that the course affected their utilization of medication databases at the point of care. These databases were accessed to determine dosages, side effects, generic names, and drug interactions (P#25): "As a result of the course I use Micromedex a lot. It helps me when I need info on a new drug." Participants also reported the intervention caused them to rely on (P#23) "online journal publications rather than outdated books" for clinical decision making. Although many physicians agreed that the330 Shuval et al.:

The Impact of an EBM Intervention

JGIM intervention changed their behavior, some admitted that changes were mostly perceptual (P#21): "After the course I was really juiced up about the whole EBM idea... I'm constantly thinking about it; I'm in the process of starting... but I haven't gotten down to it yet."

Appendix 2-005: Article Summary

ID Number: 005
Author/s: Janet Bradley and Susan Igras
Journal and year: *International Journal for Quality in Health Care,* 2005
Article Title: Improving the quality of child health services: participatory action by providers
Context and Geographic focus: Low/Middle-Income, Guinea and Kenya

THE STUDY
Aims:
- To test a quality improvement approach called Client-Oriented, Provider-Efficient services, for use in strengthening health systems and supporting Integrated Management of Child Health efforts.
Methods:
- Pre- and post-intervention observations of client/provider interactions, facility audits, staff and client surveys, and focus groups
Study limitations:
- None noted

INTERVENTION
Intervention details:
- Client-oriented, provider-efficient services supporting the implementation of integrated management of child health, with the goal of strengthening the health system
Evidence of Impact:
- Solutions implemented for majority of identified problems
Influence of implementation:
- External support from district management committees, supervisors, and community health councils

DATA
Findings:
Significant improvements seen in quality of services On almost every quality indicator, whether reported by staff, observed by evaluators, or reported by clients, the intervention sites performed statistically significantly better than the control sites only 15 months after these low-key interventions began. Although there were (expected) quality improvements in both countries related to the more direct contributions made by the project per se, such as improvements in infection prevention after training, there was also evidence of a whole range of other improvements that resulted from staff actions themselves. In the intervention sites, we observed greater avail- ability of services being provided in cleaner, more pleasant, more private settings. We also observed (confirmed by clients) more respect and information for clients, more privacy, with improved provider interpersonal communication skills, use of improved diagnostic skills, improved home care instructions, some improvement in prescribing practices, and improved immunization practices. We also found more informed and more satisfied clients, and their acknowledgment that changes in services had occurred over the past year. *Why did COPE trigger staff actions to improve quality?* The COPE exercises only suggest what standards of care might be; there are no specific interventions. Limited short raining requested by staff in information, education, and communication approaches, infection prevention, and facilitative supervision was conducted, but the changes seen in this study are much broader in scope and begin to address the underpinnings of quality services. Nobody told staff that they needed to treat clients better, give out more information, ensure uninterrupted consultations, and take better histories. Working

through the COPE exercises enabled those individuals willing to look critically at themselves to plan and make changes to self-identified problems. Working through the exercises as a group of staff helped foster a critical mass of enabled workers.

With an open-ended intervention like COPE, what led staff to take specific and sometimes bold actions to improve quality of services? Staff generally knows what needs to be done to provide quality services. But they sometimes forget; or they are unable to do a good job because they lack the tools or the technical expertise, or they lack feedback on their performance; or they are so demoralized that they have given up trying to understand and interact personally with their clients. We had hypothesized that the COPE intervention would lead to personal and organizational change that providers would feel empowered, more confident and free to act, assume ownership of the problems (and the solutions), have raised morale and commitment, be more reflective, and feel better sup- ported. Findings from end-of-evaluation staff focus group discussions, reported elsewhere [12], confirmed that staff did indeed feel that they had begun to break down some of the communication barriers and inertia running through their health services and that COPE had helped to provide the fertile ground upon which organizational change could occur, changes that led to improved quality of service and enhanced client satisfaction. Staff told us that the fact of outsiders not identifying the problems, not suggesting the answers, and not providing the solutions, but instead creating an enabling environment for staff to do those things themselves, is what stimulated action and created change. This very ownership of problems and their solutions, although daunting at first, seems to have had a strong impact on staff attitudes toward their work environment and in changing their own behaviors/interpersonal interactions with other site staff as well as with clients. This was reinforced by feelings that management, supervisors, and clients appreciated them and were relying on them to make good decisions.

What types of issues were not affected by COPE?
Although COPE could effect changes on service quality in many areas, there were a few indicators where there was little or no observable difference between intervention and control sites. For example, there were generally poor prescribing practices in both intervention and control sites in both coun- tries. Although COPE can raise issues such as these, some problem areas still will require specific technical skills and knowledge to address them.
There are other areas where staff are constrained in their ability to take action. The data showed that there were little observable or sustainable differences between the intervention and control sites in availability of drugs and equipment, even though many intervention sites had taken steps to work with the local health committees to make funds available from the community coffers for such purchases. The import- ant role of external support from district management committees, supervisors, and community health councils is crucial to solve such problems and to keep facility staff engaged in their own problem resolution efforts.

Appendix 2-006: Article Summary

ID Number: 006
Author/s: Jeffery N. Epstein, Joshua M. Langberg, Philip K. Lichtenstein, Beth A. Mainwaring, Carolyn P. Luzader and Lori J. Stark
Journal and year: *Pediatrics*, 2008
Article Title: Community-wide Intervention to Improve the Attention-Deficit/Hyperactivity Disorder Assessment and Treatment Practices of Community Physicians
Context and Geographic focus: High Income, United States

THE STUDY
Aims:
- To implement and to test a quality-improvement intervention aimed at improving community-based primary care providers' adherence to the American Academy of Pediatrics, evidence-based diagnostic and treatment guidelines for attention-deficit/hyperactivity disorder
Methods:
- Review of patient charts pre- and post- training
Limitations:
- Recruitment was voluntary - Possible human error in data collection

INTERVENTION
Intervention details:
- Promotion of adoption of evidence-based practices for attention- deficit/hyperactivity disorder assessment and treatment practices, with the goals of improving community-based primary care providers' adherence guide- lines
Evidence of Impact:
- Increased patient communication and medication follow-up
Influence of implementation:
- ADHD Collaborative training

DATA
Findings:
First, the intervention introduced PCPs to the essential systems components of the chronic care model. including self-management support, delivery system design, decision support, and clinical information systems. Addressing multiple components of the chronic care model likely improved our outcomes Second, assisting PCPs in incorporating these chronic care components into their office operations resulted in decreased variation in practices among PCPs, more reliance on members of the office support staff to assist with information management (eg, sending out and scoring rating scales), and more-systematic assessment and documentation of responses to therapy. Although this intervention model produced significant improvement in individual PCP performance, our data revealed clearly that assessment practices were more successfully adopted than treatment practices. This is illustrated by the nearly 100% use of assessment rating scales, compared with the 26% to 66% use of follow-up rating scales to track medication responses. The difficulty of improving the medication maintenance practices of PCPs has been noted in other studies. There are several possible reasons for the observed difficulty of changing treatment practices. First, PCPs may be more comfortable using a qualitative, open-ended interview process for measuring treatment responses (eg, "How has your child been doing this past month?") than using a quantitative rating scale system. Presumably this is not the case with assessment, where there exists a clear understanding by PCPs that they need to use a set of

standardized criteria to make a valid diagnosis. Another reason may involve the logistic problems associated with distributing, collecting, scoring, interpreting, and filing multiple sets of rating scales during the medication titration and maintenance phases of patient management. Continued improvement in incorporating the treatment recommendations will require a better understanding of the attitudinal and office systems barriers that interfere with the attainment of targeted treatment process goals.

Also, the magnitude of treatment change was quite substantial (effect sizes of 1.5). These response rates and effect sizes equal or exceed those observed in pharmacologic clinical trials but likely are inflated because of rater biases that emerge from open, non-blinded, administration of treatment. We have yet to test how these measures of treatment responses compare with those for children treated by PCPs using typical prescribing practices.

Appendix 2-007: Article Summary

ID Number: 007
Author/s Elwyn, G. Williams, M. Roberts, C. Newcombe, R.G. Vincent, J.
Journal and year: *Quality in Health Care*, 2008
Article Title: Case management by nurses in primary care: analysis of 73 'success stories'
Context and Geographic focus: High Income, United Kingdom

THE STUDY
Aims:
- To reduce the number of unplanned medical admissions referred to the Swansea NHS Trust's group of hospitals
Methods:
- Analysis of case manager case reports
Study limitations:
Limitations: - Recruitment strategy may not have been reflective of all nurses - Possible reporting bias

INTERVENTION
Intervention details:
- Case management by nurses, with the goal of reducing hospital admissions
Evidence of Impact:
- Nurse's case notes
Influence of implementation:
- Advanced primary nurses felt empowered to tackle issues with usual protocol

DATA
Findings:
Theme 1: assessment and co-ordination of care The majority of the accounts (35 cases) were descriptions of cases where the nurses had reviewed the patients' needs, particularly around the use of medication, and assessed their needs for support from the local pharmacy or social services. In over half of these 35 cases, adherence to a complex regime of medication was the main problem. Typical solutions were the introduction of solutions such as simplified regimes, support and education of patients and carers, or technological support, such as NOMAD trays (drug compliance aids). One 84-year-old woman (case 33) with asthma and diabetes, severe osteoarthritis and polymyalgia rheumatica had been given two types of asthma inhalers, each with activation techniques. One device was therefore provided, which was simpler for the patient to use. In almost all cases, other factors in addition to medication review played a part in the problem assessment. The accounts describe individuals who had complex needs best addressed by co-co-ordinating a range of local, social, primary and secondary care providers. Two similar cases illustrate this type of work undertaken by the case managers: Case 22: 96-year-old male requiring anticoagulant monitoring This patient lived alone and had poor sight: his daughter lived away. He had diabetes mellitus, atrial fibrillation and hypertension and was being prescribed warfarin, as well as other medications. Although international normalised ratio (INR) tests were being done to monitor the degree of anticoagulation, advice about adjusting the warfarin dose was being posted to his home. However, as he was unable to read the advice and his control was poor, this placed him at significant risk of bleeding. The case manager arranged for the results to be telephoned to the patient and arranged more frequent

blood tests at which his dosing plan and adherence was monitored more closely.

Case 36: 89-year-old female requiring anticoagulant monitoring This patient was blind, lived alone and had been diagnosed as having ischaemic heart disease and heart failure. She was reportedly spending over £100 per month on taxi fares to attend for blood tests as she was on warfarin. The case manager felt this was inappropriate and arranged for blood tests to be done at home by the community nursing services.

The patients described were almost invariably having difficulty with mobility. Case 12 was an 89-year-old female who lived alone and was unable to get out independently. Although she had diabetes she had not received any diabetic checks for 3 years. The case manager found that she had high blood pressure. Medication was started and a NOMAD tray arranged.

Six cases provide graphic accounts of another set of problems – the lack of careful handover arrangements for patients discharged from hospital. Two cases are described of elderly patients put at risk because of poor discharge planning. One 71-year-old woman (case 16) with depression was severely distressed and had no arrangements for review. An 83-year-old man (case 63), having been admitted with acute confusion, caused by an exacerbation of COPD, had taken his own discharge. However, partly due to the speed of discharge, no arrangements had been made for follow-up, and urgent arrangements were required to ensure his safety at home. Similarly, there were two examples of patients discharged after recent stokes with no rehabilitation arrangements. One patient, aged 77 (case 66), was discharged with swallowing difficulties. A patient aged 85 (case 19), who had speech loss, was described as becoming 'frustrated' after spending a few days at home, to the point of becoming 'unmanageable'. In these situations, case manager support was reported to have avoided re-admission to hospital.

In almost all accounts, the case manager liaised with other services to call upon extra services. Some accounts specifically describe formal referrals to other services. For example, one 83-year-old man with increasing mobility problems due to Parkinson's disease was referred to a residential rehabilitation unit (case 51), another to Cruise for grief counselling (case 3), and another to the Expert Patients Programme (case 2). An 80-year-old patient (case 54), who was suspected of having myasthenia gravis, had been waiting for many months for a diagnostic procedure. The procedure was expedited within 2 weeks. Another 80year-old patient (case 55), having waited for many months for a neurological opinion, was rapidly prioritised. While these examples did not result in avoided admissions, they illustrate the advocacy role assumed by the case mangers.

Theme 2: diagnosis and co-ordination of care
There were 29 accounts recorded where new diagnoses were described and where additional care services were arranged or co-ordinated. The majority of these cases related to either cardiovascular (9 cases) or respiratory system problems (7 cases). In these cases, changes to medication regimes are described – such as increased doses of diuretics, increases in angiotensin converting enzyme inhibitors, or more instruction in the use of inhalers and nebulisers. Among the nine cardiovascular cases were three patients where digoxin toxicity was considered and confirmed. The case managers also noted instances where potentially serious errors were observed and consequences averted. One patient was noted to have been incorrectly prescribed two forms of beta-blockers and another found to have a very low level of haemoglobin while concurrently prescribed non-steroidal anti-inflammatory drugs and aspirin. Yet another patient with tremors and a tachycardia was noted to be taking inappropriately high dosages of a combined short-acting inhaler (Combivent).

There were three accounts where urinary tract infections were identified and treatment organised. All were elderly women with numerous co-morbidities, two of them lived alone. Case 26 (see below) indicates how the case manager avoided an acute hospital admission by working with a social worker to organise a respite care bed and a care package in time for her return home.

Case 26: 93-year-old female with urinary tract infection
This patient lived with her son, who was in full-time employment. She had developed confusion: for two days before assessment she had not been eating or drinking as normal. A diagnosis of urinary tract infection was made and the problem treated. In addition, to avoid acute hospital admission, extra social services support was organised until a respite care bed was found in the community.

Case 11 provides a noteworthy account of a crisis averted: a 75-year-old female, living alone, had multiple urgent unplanned admissions due to an electrical problem at home. She panicked when her nebuliser had no power supply. The case manager intervened by organising an electrician to fix her electrical problem and as back-up, arranged a battery-powered nebuliser. No further unplanned admissions were recorded.

Theme 3: admission to non-acute bed
Among the 73 accounts, six described admissions to non-acute beds: three, aged 75, 81 and 82 years, were described as having heart problems. Two 75-year-old patients were described as having exacerbations of chronic obstructive airways disease: one was admitted to a community 'winter bed' and the other to a 'nursing home'. Case 26 (see above) was a 93-year-old who developed a urinary tract infection and was found a respite bed.

Theme 4: terminal care facilitated
Three cases are described where the case manager facilitated terminal care at home. An 82-year-old woman in end-stage respiratory failure wanted to stay at home in the company of her husband and family (case 1); a 68-year-old woman with lung cancer (case 24) was supported to explore her, and her husband's, preferences, before eventually accepting the help of a community-based palliative care team. A 77-yearold man with prostate cancer deteriorated rapidly and required the support of the case manager to coordinate an overnight carer rota that included district nurses and home carers from both local services and Marie Curie.

Appendix 2-008: Article Summary

ID Number: 008
Author/s: Susan R Kirsh, Renée H Lawrence, and David C Aron
Journal and year: *Implementation Science*, 2008
Article Title: Tailoring an intervention to the context and system redesign related to the intervention: A case study of implementing shared medical appointments for diabetes
Context and Geographic focus: High Income, United States

THE STUDY
Aims:
- To identify themes and issues that will inform others interested in conducting or refining SMAs, or other organizational change - To improve intermediate outcome measures for diabetes for patients at highest cardiovascular risk
Methods:
- In-depth case analysis
Study limitations:
- Retrospective study with limited standardized data, no recruitment data

INTERVENTION
Intervention details:
- Shared medical appointments for diabetes patients, with the goal to identify themes and issues that will inform others interested in conducting organizational change
Evidence of Impact:
- Positive reception from patients and health workers. Interest in extending to hypertension and other like disease. Plans to build specific venues to facilitate group appointments
Influence of implementation:
- Shared appointments implemented alongside the Academic Chronic Care Collaborative by the Association of American Medical Colleges and the Institute for Healthcare Improvement

DATA
Findings:

Accommodating the innovation into the local context: initial decisions

Once the decision was made to begin SMAs, it was necessary to create general guidelines about SMAs and translate those into the local context, with its resources and needs. Implementation fidelity is often presented as critical to achieving the levels of efficacy demonstrated in clinical trials. However, it became apparent that descriptions of SMA interventions provided insufficient detail to guide implementation into differing clinical settings. While decisions and potential options were sometimes discussed, guidance on translating and mapping out to the local context was not provided. Table 2 outlines the initial dimensions of the SMA innovation we identified (first column). The second column delineates our initial decisions or translation of the intervention to the needs of the local context. In order to maximize success and meet demanding clinical care needs, we began with diabetes as a focus because of the existing core team and its openness to change, some collaboration between key disciplines was loosely in place, the volume of patients with diabetes, the cost to the organization, and the high demand of resources required to manage patients with diabetes. However, as is true with most decisions, there were aspects of many decisions that included promoting factors but also came with hindering factors. Therefore, Table 2also outlines the promoting and hindering factors associated with each of the initial decisions.

It is worth highlighting key promoting factors for the innovation that relate to the system levels because ultimate system redesign requires successful alignment and interplay between all levels. While the organizational structure is very hierarchical (Figure 1), there was openness to novelty. In fact, there was the supramacrosystem level mandate to begin SMAs, with considerable latitude given to how those mandates were achieved. Descriptions of the transformation of the VHA describe these seemingly contradictory strains [42]. Thus, at the supramacrosystem level, promoting factors included the mandate for action to address performance deficiencies, the so-called 'burning platform' and the simultaneous freedom and flexibility to pilot test to secure buy-in[43]. At the macrosystem level, there was similar support for innovation. At the mesosystem level, a strong core care team was essential that reflected multi-disciplinary members from the various services that would be linked. This team was open to new care models and expanding roles with a leader who had the ability to make changes at the microsystem level. Although Table2 identifies a number of promoting factors, we believe that the most essential factors were the formation of a core team committed to quality and improvement, and the leadership provided by the clinic director that was supported strongly by the team members. At the same time, there were several key innovation-hindering factors associated with the general mandate to conduct SMAs and the specific decision to translate the mandated innovation into the local context: limited resources (such as space); potential to alter longstanding patient-provider relationships; organizational silos (disconnected groups) with core team members reporting to different supervisors; difficulties in documenting workload for credit; and finally, the flexibility itself and absence of specific guidelines for meeting the mandates, resulting in a certain inefficiency and delay in the process. Implementation in a space-constrained facility that was in the midst of major construction and renovation meant that the choice of a location resulted in displaced providers

who used the space, and limited access to computers available in the conference room. There was concern that group visits with different providers would disrupt established provider-patient relationships and inhibit those providers from referring patients. The different lines of authority for each of the core team members necessitated negotiations with four different supervisors, some of whom were more open to SMAs than others. In this organization, there is a strongly perceived need (varying among different clinical and administrative departments) for meticulous accounting of one's workload. It was not intuitively obvious how to account for SMA work within current accounting systems.

Implementation and evolution

SMAs require complex changes that impact on care routines, collaborations, and various levels of the organization. As such, implementing the initial decisions involved more than putting decisions into place. As noted by others, implementers and champions of innovation are critical. This is particularly true the more complex the change and the need for system redesign. Those who conduct and carry out the implementation obviously play a key role in helping to initiate and sustain the intervention. Implementers for our SMA intervention included a physician who was the Medical Director of the clinic and an Endocrine Nurse Practitioner. The physician was an established leader of the Primary Care Clinic for two years prior to initiating the intervention and had some training in Quality Improvement. The physician felt ownership of the improvement processes overall and had the authority to solicit and get approval for staff in other disciplines to participate in the SMA. The Endocrine Nurse Practitioner was not a member of the Primary Care Clinic but was considered to be a content expert and opinion leader at our institution. She had worked with high-risk patients with diabetes for 20 years prior to the intervention and was willing to share her expertise with patients as well as other less knowledgeable team members. All members of the core team were strongly committed to working together and were key stakeholders at the mesosystem level.

Although the initial analysis and translation of the innovation (Table 2) provided a starting point and the implementers provided additional local motivation, further analysis of the SMA beyond the promoting and hindering factors associated with the decision to implement was necessary for guidance to tailor and adjust the innovation to the local context. Grol *et al*. identified a series of characteristics of innovations that might promote or hinder implementation processes [32]. The relationship between these factors and the local context is outlined in Table 3. While the relative advantage/utility was appreciated by the initiators early on, three other innovation characteristics also appeared to be critical to successful implementation: compatibility, involvement, and collective action. This innovation was very compatible with the norms and values of the institution in promoting improvement in chronic disease quality measures. The involvement of the core team who would be implementing the SMA was very high. Individuals met to collectively decide the specific details of the clinical experience for patients and providers. However, hindering factors included: low compatibility with the traditional one-on-one visit with a primary care provider, high complexity in that the innovation was difficult to explain, and low collective action from the primary

care providers who did not have input into the SMAs into which their patients would be recruited.

The initial decisions and implementation endeavors began the process of practice change, but iterations of tailoring the intervention and negotiating system redesign were necessary. While not surprising that there would be issues on the path from start-up to sustainability, little attention has been given to identifying and categorizing them. Within our local context, the SMA process for patients with diabetes has changed over the last two years. These changes have occurred at the level of the clinical microsystem, mesosystem, and macrosystem. Within the microsystem, many changes have involved team structure, the patient population, and clinic flow. In Table 3, we have used the Grol *et al*. framework to list the key changes over time and strategies for promoting implementation and sustainability [32]. This framework identifies the flexibility and adaptability during implementation as a dimension which can either promote or hinder the process. We found that because our SMA had a strong core team, this was an important aspect to identify and maximize throughout implementation. Once identified, we could use this promoting factor to offset challenges encountered during implementation. The lack of clear designation of what the innovation and team members needed permitted the team to adapt the innovation to the local context and needs throughout the implementation process. As an example, we recognized after initiation of the SMA process that patients wanted to discuss dietary issues in detail, and we subsequently added a nutritionist. Another example is the response to the challenges of documenting the patient visit. We initially used the group note function in our electronic medical record. The group note field allows text to be entered that will appear in the note of every patient in the group. However, it was recognized early on that such a note did not allow for customization. Therefore, we initiated the development of a template note with embedded guidelines that was user-friendly and facilitated the efficiency of documentation and standardization and completeness of individual treatment plans. This development took place over a period of several months. Another characteristic is that of complexity of both the innovation (SMA) and its implementation. The SMA was something that was identified initially as a vague unknown type of clinical care which was not easy to explain to the primary care staff. This constituted a barrier to successful implementation. We decided to take advantage of a trial period with small numbers of patients to highlight success as well as allow clinic practitioners to sit in on one to three SMAs. Through identification of this barrier we were able to develop a strategy to overcome it.

Results: Evolution of the conceptual model

The right side of Figure 1 depicts the conceptual model that evolved with the successful implementation of SMAs for patients with diabetes. The system redesign that resulted from implementing SMAs included continuous tailoring of the intervention to and continuous adjustment of the local context. This interplay of co-evolving components added a new clinical venue to which referral of patients was possible. SMAs were designed with the idea that they would exhibit the characteristics of a high-performing clinical microsystem; *e.g*., alignment of roles and training for efficiency and staff satisfaction; interdependence of the care team to meet patient

needs; integration of information and technology into work flows; and supportiveness of the larger organization. However, we felt that to conceptualize SMAs as another clinical microsystem was confusing, given the co-presence of the more traditional microsystem and the unique way SMAs expanded and integrated other services and resources of the primary care clinics that was contrary to traditional thinking about care. Moreover, the primary responsibility for the patients seen in the SMAs was and would remain in the hands of the primary care provider in his or her microsystem. Accordingly, SMAs are identified as an intra-mesosystem component to recognize the linkages among and between other meso components (intra-meso) beyond the microsystem, and to emphasize the system redesign. Additionally, the SMA with its own iterative improvements and evolution seemed a separate system as opposed to a higher functioning system that already existed. This is in contrast to the initial system design where there was only the closed microsystem with the components within (intra-micro) the inner clinical microsystem.

System redesign is also reflected in the arrangement of the SMAs: the squares in Figure 1 represent participants on equal footing by recognizing the role of each discipline's expertise, including the patients who also bring expertise to the exchange. In addition, the graphic representation of the flow of communication underscores the mutual contributions and simultaneous, non-sequential nature of the interactions for patients and providers. Finally, the clinical microsystem and the intra-mesosystem (SMAs) are overlapping to reflect that SMAs do not eliminate the traditional clinical microsystem but rather offer another opportunity for care, with both approaches co-evolving. This point is particularly important to recognize, as one concern providers often expressed was the potential undermining impact SMAs might have on the individual provider-patient relationship.

Local context and sustainability of SMAs two years later

The current local context and care-based practices related to diabetes are summarized in Figure2. Changes or differences are denoted in italics, with items directly impacting on diabetes care aligned on the right side of the last column. The current state of the SMAs for patients with diabetes is summarized in the pull-out box that reflects the intra-mesosystem redesign level. Figures 1 and 2 help to identify the major changes and shifts in local context as well as the issues related to tailoring the intervention and adjusting the context.

It is worth highlighting some issues at each level of the care system. At the supramacro level, while continued improvement in information technology helps further support the SMA as configured at the local level, the mandates and priorities have changed. While this is to be expected, it does alert innovators and implementers to appreciating windows of opportunity. If the innovation has not taken off and achieved a force of its own (including demonstrating some levels or areas of success consistent with the organizational goals), changing priorities (new mandates), and the lack of success will create increasingly difficult challenges.

Given the demonstrated successes, leaders at the macrosystem system want the SMAs to be

expanded to other conditions and possibly other care sites, *e.g.*, the community-based outpatient clinics linked to the main facility. Some new or adjusted practices beyond the actual SMA venue at the mesosystem level have also come about because of SMAs (*e.g.*, monthly clinic meetings to discuss resource allocation and group meetings among discipline representatives) and some will help to further propel SMAs forward (*e.g.*, registry and protocol development to identify high-risk patients).

At the microsystem level, primary care providers are experiencing more pressure to meet performance measures of quality and productivity (and at the supramacrosystem level, the current context is also for more prescriptive approaches about how to achieve goals). The objectives of the diabetes SMA map out to the increased pressures experienced by providers. Seeing the successes of the SMA, providers began to send patients with A1c levels very close to goal. This was not necessarily all positive, as we were unable to accommodate those identified in the registry with an A1c of greater than 9%. While the magnitude of the increase in referrals to SMAs created some unanticipated adjustments, we have worked and continue to work and negotiate with providers to prioritize resources. Their clear desire to refer more patients to SMAs underscores the growing foundation for sustainability.

Many factors contribute to implementation and sustainability of the SMA within the mesosystem (intra-mesosystem component) and with regard to its relationship to the clinical microsystems. Most importantly is how the SMA is valued. The increased number of referrals is evidence of the value placed on SMAs by the mesosytem providers. SMAs are valued by the professionals on the team based on their experiences with patients and on their feelings of a high degree of 'teamness', or esprit de corps [45]. Team members meet after each SMA where various members take turns working a little extra to support the SMA during non-clinical time with activities like making extra phone calls, generating letters to new patients, tracking patient satisfaction data, and meeting to change flow, if needed. In addition, the flexibility of the individual team members is manifest during the SMA sessions; all staff members pitch in with clerical duties as needed, re-check blood pressures, and download glucometers. A weekly meeting after each SMA continues to occur to discuss patients and processes to assure that all team members have an open forum to voice concerns and make group changes, thus maintaining the high degree of shared governance. In addition, beyond improved clinical outcomes, patient satisfaction has helped confirm the added value to providers and to administration (macro- and supramacrosystems). Patient satisfaction surveys routinely are administered following the SMA. Typical comments from patients have included: 'I learned a lot', 'this clinic really takes such good care of patients' and 'I wish this kind of clinic existed 20 years ago.

Appendix 2-009: Article Summary

ID Number: 009
Author/s: Rebecca Olbort, Cornelia Mahler, Stephen Campbell, Bernd Reuschenbach, Thomas Mu¨ller-Tasch, Joachim Szecsenyi & Frank Peters-Klimm
Journal and year: *Journal of Advanced Nursing*, 2008
Article Title: Doctors' assistants' views of case management to improve chronic heart failure care in general practice: a qualitative study
Context and Geographic focus: High Income, Germany

THE STUDY
Aims:
- Explore the views, concerns and experiences of doctors' assistants of case management for patients with chronic heart failure,
Methods:
- Focus groups
Limitations:
- Trial context may not be reflective

INTERVENTION
Intervention details:
- Case management of chronic heart failure by doctors' assistants, with the goal to improve chronic heart failure care in general practice:
Evidence of Impact:
- Increased continuity of care
Influence of implementation:
- Teamwork, especially on the part of general physicians

DATA
Findings:
Four main categories were identified from the data: • Implementing case management – supporting factors and barriers on a practice level; • Implementing case management – positive and negative experiences with patients; • Disease-specific benefit; • Role perception and relationship to patients and GP. Implementing case management The implementing case management category describes factors, which facilitate or inhibit the effective implementa- tion of case management in general practice. The supporting factors and barriers: the organization and practice team Supporting factors and barriers: the organization and practice team relate to each member of the team (doctors' assistants, general practitioner and other non-healthcare professionals) and to organizational practice issues. They demonstrate the wide range of practice-specific solutions for the successful implementation of case management. Reason to participate Doctors' assistants' attitudes towards their new role as a case manager were influenced by their reason for participating and prior involvement in the HICMan trial. Participants who discussed their participation with their employing GP and were asked to participate in case management started with a positive attitude. In contrast, a barrier was created for those who were nominated by their GP for participation in the project: Yes, with us it was the same. We'd already taken part in the ''Train the Trainer'' trial and initially I didn't want to continue to take part... Well, I was quite negative towards the whole thing because I was pushed into it, but now...with the feelings I have now, I would have probably agreed to take part. (FG 1 DA19) This quote shows an initially negative attitude towards case management by this participant, which changed during the course of the intervention.

Time to accomplish case management
Because the tasks associated with case management were new to doctors' assistants, the time taken and available to accomplish them was important in its implementation. The majority of participants perceived that the satisfactory rou- tine implementation of case management needed to be accomplished during normal working hours: Well, I did the home visit directly from my (home). Normally I have to be at work at 4 pm, and in that case I was at the patient's home by 4 pm....That's a must. (FG 4 DA 27)
I have the lucky opportunity that I'm at work Tuesday afternoon for 2 hours where there's no practice routine...that's when I do my phone calls. (FG 4 DA25)

In contrast, some doctors' assistants could not accomplish some tasks, such as home visits, during normal working hours or could only do so if they transferred other tasks to colleagues: Because there are only the two of us and I am responsible for the phone calls for the whole day and I then I just can't say, 'I'll be off now.' (FG 2 DA5) I practically do it during my time off. I work part-time 20 to 24 hours a week, always in the afternoon – and the first home visit was on a Monday... The day started at 8am and went until 10Æ30 or Æ45. That's how long I was busy then. (FG 4 DA24)

Team members
The support of all team members, but especially the GP, was regarded as crucial. This support helped doctors' assistants understand their new roles as a case manager, for example by discussing the telephone monitoring sessions or home visits with the GP afterwards. It also ensured that any changes subsequently initiated by the GP were understood by the doctors' assistants: He (the GP) involves me also afterwards regarding the changes or consequences. For example, when he adds a new medication. He considers it as very important and also appreciates that I do it (the case management). (FG DA13)

Overall, for the effective implementation of case manage- ment, it was important that doctors' assistants received support from the whole practice team: Well, we've organised that a little in the practice. So now on days when I do it (case management) we are always one colleague extra. On those days I'll make the phone calls or the home visits and after visiting hours we'll talk about it all. (FG 2 DA1)

Most participants reported that feedback received from GPs about their case management reports was valued and showed the shared nature of the management process: He [the GP] then includes me afterwards, regarding the changes or consequences of it [the monitoring]. Or if he adds some new medications. (FG 3 DA13)

If doctors' assistants did not receive this support, implement- ing case management within normal daily routine was jeopardised: Well, I do think it's a pity because we all do put in a lot of effort and do it with dedication and with whole heart, and I just think it's a pity and that annoys me to a certain degree, because I've put in effort and the patient was willing to take an hour for the home visit and then it's just dealt with on the side. No, it's worth more than just a bit of bla, bla,... (FG 2 DA4)
Well, I experienced something like a double burden. Because I had to arrange my boss's things. And then had to make sure that everything was right. (FG 3 DA8)

Positive and negative experiences with patients
Positive and negative experiences with patients' factors relate to experiences with patients while implementing case management, which either enhanced or inhibited implementation of the case management approach by doctors' assistants.

Positive experiences with patients. All participants described a wide range of positive situations that they experienced with patients, particularly being able to give them more time and attention while implementing case management. According to participants, this also satisfied the

needs or wishes of patients: It's very interesting, when the people start talking. According to the motto, 'Now somebody's got time for me.' You feel that it really appeals to the patients. They can now talk quite a bit more than usual when they visit the practice. (FG 1 DA20) This enhanced role and working together with patients was seen by most doctors' assistants as a positive shared effect of case management.

Many also want to show what they do. One of my patients showed me his brand new fitness bike in order to show me his activities, and said that he uses it in the morning in front of the TV... They really enjoy that. (FG 2 PA1)

Negative experiences with patients. A minority of negative experiences were perceived by some doctors' assistants, such as poor motivation by patients resulting in suboptimal cooperation and a negative attitude towards case management: But all in all it was the only unmotivated patient, who always says, ''I don't really care what happens afterwards''. And when I get there and see that things have become worse or are different than usual, then I'll ask afterwards... But that's part of the few things that I would actually prefer to forget. Because he doesn't appreciate the collaboration. (FG 3 PA8)

A large number of problems arose during performance of the elder care basic assessment, particularly while performing the dementia test, because doctors' assistants perceived patients to be embarrassed: I also experienced that they had problems with the DemTect [a screening test for dementia] because of the writing, the thing with the numbers. And that they therefore felt quite embarrassed. Maybe that we would assume that they could not spell correctly, that they were too dumb (FG 1 DA16)

Reflecting on experiences with patients
A minority of doctors' assistants described situations where they felt insecure in new or unforeseen situations with patients and that it was unclear where such events fitted in the case management protocol; for example, encountering more emotional involvement:
For example, in the column physical activities there was one patient who said, that his cardiologist said that he's not allowed to do anything any more. He should only look at the roses, not even cut them... Should I put down that he shouldn't do anything any more or ... then I started considering what I should record. (FG 4 DA24)

The following quote shows how a doctors' assistant described one such situation:
Well, I had one incident in between. When I called the first time everything was okay and 10 days later the patient had a little stroke and that hits you really hard – ''Did you do anything wrong? Did you miss out on anything?''. ...You just don't know that then. (FG 4 DA26)

Subsequently, some doctors' assistants used these new expe- riences to develop new routines and strategies to cope with these situations: Once the first phone call and the home visit are done, you just get the hang of it, and then it actually works quite well. (FG 2 DA1)

Disease-specific benefits
The disease-specific category describes situations in which doctors' assistants considered that case management was beneficial for patients with regard to disease-related issues and patient outcomes.

Perceived improved patient self-management and identification of patient problems Most participants thought that case management was effective in improving disease-specific self-management for patients with CHF. They emphasized the importance of physical activity while counselling patients and perceived that these actions led to increased physical activity by many patients:

He even wanted to attend the coronary heart sports group with his neighbour because the neighbour was been doing that for years, and he asked us if he could do this also. (FG 2 DA5)

And my old granddad, he wants to add an extra half an hour now, so he gets some more exercise, because up until know he's only taken his walking frame to go down town and back, and now he'll walk around an extra block. (FG 2 DA5)

Moreover, all doctors' assistants thought that most patients developed a better understanding of their disease and self-awareness about its course as a result of case management:
But in the meantime he observes himself better. And he reacts better. He also has diabetes and has changed himself completely. (FG 4 DA 24)

All doctors' assistants acknowledged that the case manage- ment approach had helped the practice team to detect and address relevant disease-related patient problems:
Especially concerning the patients' drinking habits. My boss never knew that all three patients were drinking wrongly. One drinks far too much, about 4 litres a day ... Well, that was only revealed by the first phone call. (FG 3 DA13)
Well, I can only remember that one time, where I phoned him and he complained about being short of breath that day. I didn't know if he would have called, I just don't know... Well, I think, if he wouldn't have come forward and would just have waited, then maybe he would have ended up being taken to the hospital by ambulance sometime. (FG 2 DA1)

Relationships and role perception
The new case management role for doctors' assistant led to changes in their everyday routines. The relationships and role perception category describes participants' perceptions of their changed relationships to patients and GPs and their new role generally.

Improved relationships, continuity of care and awareness of the patient All described how their new role as case manager had improved their relationships with patients. These had become closer, more intensive and involved more contact, resulting in more personal relationships:
Well, I find the contact with the patient is really a lot more intensive than it used to be, which is a new experience for me and for the patient (FG 2 DA1)

That is really more intensive and they entrust more to us (FG 2 DA5)
According to many participants, this perceived improvement in the relationships resulted in patients identifying doctors' assistants as caregivers, which facilitated continuity of care. Patients started to seek consultations with the doctors' assistants, which was described by participants as a positive experience, but it could lead to difficulties such as lack of time during normal practice working hours:
When they then come to see you in the practice, their eyes are also looking for you, you do realise that. But that is not at all unpleasant. (FG 4 DA25)

The majority participants reported developing greater under- standing of patients' backgrounds and psychological well- being, in terms of patients' social environments:
For me, it was a real experience to see in what kind of a domestic environment he lives now... Because that's something one couldn't really place beforehand. (FG 2 DA1)

Or that one just simply pays attention to the oedemas. They sit on the examination table and then you look – ''Oh, do you have swollen feet?!'' etc. I do notice myself there. (FG 3 DA14)

Appendix 2-010: Article Summary

ID Number: 010
Author/s: Lisa V. Rubenstein, Louise E. Parker, Lisa S. Meredith, Andrea Altschuler, Emmeline de Pillis, John Hernandez, and Nancy P. Gordon
Journal and year: *Health Services Research*, 2002
Article Title: Understanding Team-based Quality Improvement for Depression in Primary Care
Context and Geographic focus: High Income, United States

THE STUDY
Aims:
- Assess the degree to which local clinician participation in quality improvement intervention design versus delegation of design to regional experts affects the quality and longevity of quality improvement intervention programs for depression in primary care. - Evaluate what additional characteristics of quality improvement teams and their organizational environments predict implementation of a high-quality, enduring depression intervention program
Methods:
- Qualitative observations, semi-structured interviews, telephonic interviews
Study limitations:
- Did not carry out formal content analysis - Outcomes may change with adverse events - Unsure how intervention affects patients' care - Questionable intervention sustainability (funding, will)

INTERVENTION
Intervention details:
- Central quality improvement team: emphasized meetings in the local primary care practice involving a multidisciplinary team and a QI facilitator, with some expert input - Local quality improvement team: emphasized delegation of planning to regional experts, with some input from local primary care practice clinical leaders.
Evidence of Impact:
- Computer medical records
Influence of implementation:
- Initially successful, all programs operating after six months (except one) but only two operating after one year.

DATA
Findings:
In the priority-setting process, high-level management at each organiza- tion indicated the importance of increasing provider and patient knowledge about depression. Both organizations also endorsed increased access to depression evaluation and care. The VA, but not KP leadership, endorsed screening for depression in primary care and referring all detected patients to mental health specialists. Only KP endorsed improved management of depression in primary care. QI teams reacted positively to receiving, and indicated they would aim for, the priorities endorsed by management, even when they disagreed with them. For example, VA QI teams disagreed with management's goal of referring all depressed patients to mental health, but preferred knowing about this issue up front. The QI team process followed the protocols outlined in the manual with a few exceptions. One team (VA-CT) developed its proposal in less than 10 hours of meeting time, as opposed to the recommended 16. Only the VA teams conducted pilot test cycles and used the resulting

information to improve their intervention programs. All three LTs and both CTs requested additional resources or used materials from the DIRC. All teams both orally presented, and submitted in writing, their proposed interventions to their organizations' quality improvement bodies within the specified time period.

Understanding Team-based Quality Improvement

Table 2 focuses on QI team depression improvement interventions. The table shows the individual strategies included in each team's depression improvement intervention program, the expert rating for each strategy (SR), EBI summarizing the SRs, and the OPQI reflecting expert ratings of each program considered as a whole. The table also indicates which strategies were planned, planned and implemented, or subsequently implemented though not planned initially. Overall, team intervention strategies addressed most key elements of the collaborative care model (Von Korff et al. 1997), including patient and provider education, detection, assessment, and case management. Two teams planned, but did not implement, strategies for collaboration with mental health specialists, the remaining key element of collaborative care. CTs within each organization had higher ratios of imple- mented to planned strategies (CT mean 89 percent versus LT mean 68 percent) and the higher EBI ratings. The LTs had both the highest and the lowest OPQI scores. The VA-CTs and -LTs had lower EBI scores than their KP counterparts.

In terms of costs, KP-LT #2 designed the least ambitious intervention program and was least costly. The KP-CT team members charged $7,018; KP- LT #1 charged $6,147; and KP-LT #2 charged $1,859, all for team member time. Charges to the KP Clinical Innovations Program for program implemen- tation show a similar pattern. The KP-CT applied for and received $101,762 (to cover two primary care practices) and KP-LT #1 applied for and received $64,741. The KP-LT #2 did not apply for implementation resources. At the VA, charges to the grant were for CT project management ($7,730), CT computer support ($1,760), LT intervention support ($1,760), and LT computer support ($200). Support from the VA Performance Improvement Council was in-kind, and not measured. Overall, the 10 VA and KP leaders willing to estimate their time indicated spending between 60 and 882 hours on the project over the two years of planning and implementation. For KP leaders, these estimates indicate that more than three-fourths of the time spent was not charged.

Results of our QI team participant panel agreed substantially with the results of our literature review in terms of the factors that might most affect the success of the QI process. Panelists generated 64 percent (16 of 25) of factors we had identified from the literature (Appendix 3, available from the authors) and ranked multidisciplinary team membership, support from mental health specialty, and team leader interest in depression or flexible problem solving during implementation (a tie) as the three most important factors. We termed the factors identified by the panel or literature review as positive factors for QI.

Table 3 shows how QI teams varied in the extent to which they manifested positive support factors for QI. Positive factors could vary across teams by design, because of poor adherence to the design, or because of natural differences. Factors are listed as high, moderately high, moderate, or low, based on study records or process notes. The following factors are not listed in Table 3 because they were rated as uniformly ''High'' both as designed and as implemented: clinician majority on teams, organizational mandate to partici- pate, and multiple stakeholders have a voice in planning. Two factors (flexible problem-solvers during implementation and leadership by respected local peers) were omitted because we did not collect sufficient data about them.

As shown in Table 3, the LT design included more positive factors, but LTs varied more than CTs in the extent to which they manifested characteristics we had tried to engender through our designs for team structure, protocols, and materials. For CT's as implemented, the only substantial deviations from expectations were lower support from clinical practice leadership in one KP-CT practice, lower involvement of pharmacists and higher use of CQI methods.

Intervention planning took an average of four and a half months. Full intervention implementation

occurred an average of six and a half months after the end of planning. All intervention programs except KP-LT #2's were active more than six months after full intervention implementation, but only the KP-CT and KP-LT #1 programs were active more than one year after full implementation. The two VA team interventions depended heavily on the computer medical record, which displayed screening test results and was the basis for summary data for feedback. One year after full implementation the software for the computer record was changed, making the system inaccessible to the teams. In the context of simultaneous facility integration, this was enough to end the active phase of the interventions at the VA.

Team leaders and members often participated in depression improve- ment activities after the end of the study at intervention sites. The KP-LT #2 leader and pharmacist participated in a subsequent depression medication case-management intervention at their facility. Frustrated with lack of coordination of mental health consultations, the VA-LT worked with psychiatry to initiate a new, prompt psychiatric consultation system that persisted after the full intervention ended. At KP-LT #1, the intervention case manager became the behavioral health specialist required by a newly adopted KP primary care practice redesign model. In one of the KP-CTs the practice continued the intervention case manager's position after the innovations funding stopped, but also hired another behavioral health specialist. Ultimately, the two positions came into conflict and the case manager left.

Understanding Team-based Quality Improvement

Table 3 also shows the relationship between each team's positive factors for QI and that team's outcomes in terms of developing a high-quality, long- lasting program. The KP-LT #1 had the highest score for positive QI factors, followed by KP-CT, VA-CT, VA-LT, and KP-LT #2, in that order. Outcome scores for program quality and longevity followed the same order. Aggregating the scores from Table 3 across teams (not shown on the table), CTs scored about the same as LTs on positive factors (1.54 CT versus 1.62 LT) and better on outcomes (2.33 CT versus 1.00 LT). The two CTs implemented their interventions in practices with equivalent positive environmental factors (1.33 KP-CT versus 1.33 VA-CT). Two of the three LT's had more environmental support than CTs and one (VA-LT) had less. In the two PC practices with the lowest environmental support factors for QI (KP-CT Practice A and VA-LT) the CT but not the LT produced an enduring program. KP teams scored better than VA teams on positive factors (1.67 KP versus 1.48 VA) and outcomes (2.11 KP versus 1.17 VA).

Two teams experienced outstanding success in developing a high-quality program that remained active for more than a year after full implementation (KP-CT and KP-LT #1), one team had moderate success (VA-CT), and two teams had low success, with KP-LT #2 having the lowest ratings for program quality and duration of implementation. No team that did not have high ratings on two of three of the QI team leadership measures (interest in depression, content expertise, and participation) succeeded. No LT depression improvement program succeeded in a practice without high ratings on either support from mental health specialty or clinical practice leadership.

Appendix 2-011: Article Summary

ID Number: 011
Author/s: Sennun P, Suwannapong N, Howteerakul N, Pacheun O.
Journal and year: *Rural and Remote Health*, 2006
Article Title: Participatory supervision model: building health promotion capacity among health officers and the community
Context and Geographic focus: Low/Middle Income, Thailand

THE STUDY
Aims:
- Compare and identify the strengths and challenges of two different supervisory models in building the health promotion capabilities of PCU health officers and the community, based on the concept of community participation in management and health service systems development, in two PCUs in Chiang Mai Province, Thailand.
Methods:
- Questionnaires, semi-structured interviews, qualitative observations
Study limitations:
- PCU 2 already had a health promotion initiative in place which may skew the results - Selection bias of participating health officers and supervisors - Possibility of healthy worker effect where health workers appear more diligent in job due to be monitored - Several large health disruptions may have affected results

INTERVENTION
Intervention details:
- Two models implemented within primary care units: the first model involved supervisors from the district level, with full participation of health officers at the sub-district level; the second model added community involvement in the supervision process.
Evidence of Impact:
- Greater understanding between community and health services, cooperation
Influence of implementation:
- Both health officers and community members were happy about participating and participation, worked together in a common goal

DATA
Findings:
Differences in health promotion activities between the two supervisory models: The comparative health promotion activities of the two PCU were assessed by semi-structured interview, reviews of monthly reports, and an observational checklist, to ascertain whether the health officers followed the core health promotion activities package. *Supervisory model 1* The health promotion activities of the health officers in PCU 1 were prenatal care, such as teaching pregnant women, assessment of nutritional status, assessment of mental condition, promoting nutrition for children to solve malnutrition problems, assessment of development in pre-school age and autistic children, assessment of nutritional status in school-age children, health education for various community groups, and an annual physical check-up campaign for people ≥21 years. Establishment of an exercise club in the village was a community health promotion activity. *Supervisory model 2* The health promotion activities of the health officers in PCU 2 were the same as for model 1. Additional activities comprised coordinating and supporting the community committee for health and quality of life development through organizing community activities, for example, by providing a training program to enhance consumer and food vendors' knowledge of

food safety, clean food/good taste, providing social support for specific patient groups such as diabetes, hypertension, and obesity self-care. Before supervision, the PCU 2 community already had a health promotion and quality of life development club. The major activities were providing health education for pre-school parents on National Children's Day; organizing a training camp for teenagers and parents; setting up information boards for an accident prevention campaign, and setting up activities and responsibilities for sanitation and environmental health improvements in the village.

Opinions of community leaders, PCU officers and supervisors about the supervisory models: All community leaders said that they were very pleased about the opportunity to participate in the supervision because it was very useful and exactly what they needed. Participatory supervision made it possible for them to learn the problems of the community and to help solve them. They were proud to be part of the community development team with people with differing areas of expertise.

The PCU officers felt that participatory supervision for community leaders was very useful. It made them feel that they were not alone in providing health services, but that there were people in the community giving them support, particularly with community health promotion. In addition, the community leaders could provide opinions from their own perspectives regarding problems in the health center and help to promote health in the community. However, they felt participatory supervision should be more open to community leaders regarding health issues, to gain greater input, comments and suggestions for their health operations.

The supervisors felt that the participation of the PCU officers and community leaders provided better community health promotion outcomes than the other supervisory model. It accounted for more community activities, greater participation, and a sense of belonging. They expected participatory supervision from the PCU officers to have a greater effect on improving the PCU than supervision with only PCU health-worker participation.

Strengths and challenges of the PCU officers' participatory supervision (model 1) Strengths: First, after supervisory model 1 was implemented some changes occurred in the administration of medical supplies and family folder use in the PCU. (The family folder is a folder that contains brief health information of all family members, a genogram, family members' general characteristics, major health problems of each and progress notes on treatment). The records for health promotion services and annual physical examinations were completed. The second strength was its democratic characteristic. When the health officers collected the working results, analyzed the problems' causes and alternatives, and decided on the correct methods, they also gained the ability to analyze problems, and the skills to find solutions, acquiring wider perspectives and diversity in problem solving. Problem solving teamwork helped brainstorming, it involved acceptance and respect between the supervisors and the health officers. In addition, the work in the PCU had become systematic, and the health officers had increased working knowledge regarding advising clients and writing up health reports correctly. The feedback data were used for healthcare service development.

Challenges: The health officers had an increased workload due to collecting work results, preparing problem analysis and problem solving for presentation to their supervisor. Moreover, the participation required had the potential to cause conceptual arguments among the team that could lead to conflict. From the standpoint of the participants, the officers' participatory supervision did not always proceed well, and not all health officers could participate in every step of the supervision process, due to their client service obligations.

*Strengths and challenges of PCU officer and community leader participatory supervision (model 2) Strengths***:** First, as a result of implementing supervision, changes occurred in the administration of the medical supplies and healthcare practices in the PCU. Regarding health promotion, the health officers were able to work with the community health improvement and quality of life development committee in PCU 2 and the community leaders in order to solve

problems. Second, community leaders felt authorized to give feedback to the PCU regarding community problems. Third, in this supervisory model, community health promotion by the community itself worked best. This was because of community empowerment from the process of building the knowledge, skills and experiences to enable increased community self-development. The process of equal participation, without discrimination according to social status, strengthened the community and promoted greater participation. Therefore, the benefits of participation decreased reaction to change. Fourth, the participation of a wide variety of people assisted in rapid development of the community.

Fifth, from observation of participatory supervisory model 2, community leaders demonstrated cooperation and participated in sharing their opinions, presenting problems and giving advice to the health officers. Every officer in the PCU attended every supervision session. In this supervision model, the roles of both PCU health officers and community leaders changed from previous styles. Previously, the community leaders received supervision from the health officers. In contrast, with this supervision model, the community leaders played roles as supervisors while the PCU officers were supervised. They could express their demands, identify health problems and suggest solutions based on local wisdom focusing on health promotion activities. The roles of the supervisors at the district level were to control the operation according to the PCU standards and ensure that there was active participation among the partners. This new model of supervision focused on the supervisor's role, and thus the results of supervision in the first two sessions were unsatisfactory. In the third session, the officers and community leaders started to adapt, so that supervision was more constructive. Consequently, the supervisor had a clearer role in providing knowledge to the officers, similar to being a teacher.

Challenges: The challenges are similar to those of model 1, with increasing workload and conflict between the PCU health officers and community leaders during discussions. In addition, community leaders had to allocate their time to participate in the supervision.

Appendix 3: Instructions for Authors

Purpose of the Journal
*Quality Management in Health Care (QMHC)*is a peer-reviewed journal that provides a forum for our readers to explore the theoretical, technical, and strategic elements of quality management, and assists those who wish to implement this discipline in health care. In particular, it: 1. Builds knowledge about customers, processes, and statistical thinking in health care. 2. Encourages research and evaluation of quality management methods and related strategies for organisational change. 3. Fosters the application of quality management sciences to patient care processes and clinical decision making. 4. Enhances cooperation and communication between health care suppliers, providers, payers, and regulators in efforts to disseminate quality management in health care. 5. Establishes links between the various disciplines and components of quality management including organisational behavior, systems research, statistics, leadership theory, quality assurance, outcomes research, survey research, clinical epidemiology, medical decision sciences, and other.

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Prospective authors should prepare their articles in accordance with the attached " Author's Manuscript Checklist for Journals." Authors should e-mail their manuscripts to Jean Carroll, PhD, QMHC Editor, jgcconnect@att.net; mailing address: 230 East Delaware Place, Chicago, IL 60611.

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Authors should pay particular attention to the items below before submitting their manuscripts.

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- Manuscripts should be created on IBM-compatible (PC) equipment using Windows 95 or higher operating system. Our preferred software is Microsoft Word.
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- Manuscripts should be ordered as follows: title page, abstracts, text, references, appendixes, tables, and any illustrations.

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- Title page including (1) title of the article, (2) author names (with highest academic degrees) and affiliations (including titles, departments, and name and location of institutions of primary employment), (3) corresponding author's name and complete address including email, (4) any acknowledgments, credits, or disclaimers, and (5) disclosure of funding received for this work from any of the following organisations: National Institutes of Health (NIH); Wellcome Trust; Howard Hughes Medical Institute (HHMI); and other(s).
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For multiple authors in journals and books:

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Appendix 4: Coding Log

Code	Initial Definition
enabling factors	a feature which assists the implementation of an intervention
support from and sponsorship by management	executive health workers encourage and back intervention
leadership of management	executive members of department are effective leaders
efficiency	professional organization and proficiency of service
collaborating facility	a collaborative facility which is coordinated with primary care
continuous education,	regular trainings
effective time scheduling	efficient scheduling which maximizes results and minimizes down time
multidisciplinary team members	team is composed of members from various sectors
expansion of treatment	increased comprehensiveness of treatment medication or services
Patient assignments	
accountability	processes in place which promote responsibility
possible constrainers due to lack of existing systems	no existing reporting strategies in place may constrain the implementation of an intervention
no monitoring and evaluation for management	management are not subject to monitoring and evaluation practices
even workload distribution	health worker tasks are evenly distributed
referrals not following workflow protocol	primary care providers were not following the newly instructed protocol for referring patients
conflict between differing processes	health workers varied in how they following referral protocol processes
increased access due to coordinated facilities	improved access to facilities because of integration with primary care
increased efficiency	improved professional organization and proficiency of service
coordinated facilities	collaborating facilities are coordinated with primary care
more time efficient and increased level of care	improved quality of care delivered in a timely manner
changing roles and processes,	established roles and ways of doing things were altered because of the intervention
increased education	focus on improving health worker education of intervention
increased awareness of standards	health workers improved their knowledge of expected guidelines and protocols related to quality of care
standards review meetings	health workers meet to review relevant literature and education on care
interdisciplinary team meetings	various levels and types of health workers meet regularly to discuss
patient education by staff	health workers educate patients on aspects of care
varied class content	health education incorporated various aspects of diabetes care
increased efficiency and support	improved organization and encouragement
support from physicians	physicians overcome clinical hierarchy and collaborate with other health workers
reduced workload	intervention allowed better management of tasks by reducing overall workload
unintended improvements in disease management	intervention improved other areas of disease management which were unplanned
programme measure needs improvement,	intervention requires stronger measurement of outcomes
needs holistic approach,	diabetes care requires a comprehensive approach, rather than targeting specific outcome

new programme is improved,	intervention supersedes previous programme
focus on overall diabetic goals	emphasis on comprehensive diabetes treatment
negative consequence of less care on other chronic diseases	other chronic diseases received less attention as efforts were concentrated on diabetes care
affects outcomes	outcomes not reported as direct results of intervention
successes and limitations	intervention was positive despite a number of drawbacks
no demographic data available	researchers were unable to collect demographic data
unclear on demographic impact on results	unable to discern if results were different for different demographics
unclear causality	lack of data
article focus different to goal,	article focus detours from initial research question
long term cost fall, programme is cost saving	in the long term, the intervention would reduce health care costs
increased resources could mean increased cost	intervention requires more resources which would drive up cost of care
short term cost rise	intervention initially expensive
inconclusive costing	no definitive decision on intervention costs
programme successful in uptake	health workers put intervention into practice
increased communication	improved communication between various levels and types of health workers
increased understanding	improved understanding and empathy between various levels and types of health workers
	Revision (Article):
	greater understanding of the process
	Revision (Article):
	greater understanding of the process and job role
increased adoption	health workers utilize intervention features for other diseases
teamwork has positive effects	collaboration between different levels and types of health workers improved care
pride and satisfaction not validated	although unproven, intervention may have instilled job satisfaction in health workers

educate providers on systems	teach providers about the various systems of chronic care
diagnosing multiple components improved outcomes	focusing on identifying different areas of care improved overall outcomes of care
supporting providers beneficial	encouragement of providers translates into proper execution of intervention and improved outcomes
standardization of practice	different providers provide same level of care
increased teamwork	improved collaboration between various levels and types of health workers
improved diagnostics	better identification of disorders
diagnostics adopted	diagnostic measures were put in to practice
treatment less adopted	treatments less likely to be put into practice
difficult to improve treatment maintenance	hard to better the upkeep of treatment
difficult to improve medication maintenance	hard to better the upkeep of medication
practices may prefer qualitative measurements	qualitative care providers richer information about patients which may be more valuable to practices
diagnostics requires quantitative methods	diagnostics would benefit from quantitative measures
logistical issues	quantitative measures may assist in reducing logistical problems with

	consolidating data
upkeep of recommendations	practices require a systems for staying up to date on treatment recommendations
substantial treatment change	study showed large impact in treatment change
higher than trial results, likely inflated	study proved more conclusive results than RCTS but there may be confounding reasons for this
need a control group	must be validated against a control group of status quo practices
did not meet before intervention	regular meeting attendance by staff did not occur prior to intervention
intervention summoned team meetings	intervention introduced team meetings
meetings identified areas for improvement	meetings addressed the need and strategies for improvement
regularly attended meetings	regular meeting attendance
mitigated lost charts	fixed the problem of missing or lost charts
tracked chart pathways	tracked the route of a medical chart
eliminated lost “hot spots”	removed areas which would contribute to lost medical charts
changed chart protocol	
reduced patient wait time	lessened the time a patient has to wait to see a physician
addresses tension	workplace tension acknowledged and dealt with
7 unsuccessful	7 practices unsuccessful in the intervention process
no teamwork	staff unable to collaborate and work together
controlling leader	lead physicians or managers refused to relinquish control of the meeting agenda
preservation of control	lead physician or manager refused discussion not aligned with agenda
counter productive	intervention creates issues rather than solving them
team members give up	staff demotivated
public private disconnect	leaders publicly support intervention but privately try to shut it down
dysfunctional	staff unable to function as a team
staff hesitant to speak out, fear of superiors	staff do not question or vocalize opinions
lack of safety	lack of safety became a barrier to staff participation
belittlement,	staff are belittled by superiors
negative reinforcement	superiors incorrectly reinforced staff as the problem
communication breakdown	staff refuse to speak openly
fear of superiors	staff fear their superiors
superficial support from superiors	superiors vocalize support, unable to show it
absent leadership	superiors absent from meetings,
going through motions	pretended to implement intervention
all identified and set improvements	all practice set and reached targets
almost half continued	half the practice continued intervention
implementation timing essential	timing critical to successful intervention implementation
organization	staff used intervention or organize themselves
intervention valuable	intervention proved valuable to staff
intervention valuable for problem solving and decision making	intervention increased problem solving and decision making
intervention valuable after time period	staff voluntarily extended intervention
increased communication	intervention encouraged communication
empowering	staff found intervention empowering
sustained interventions made	extended interventions introduced adjustments such as staff rotations

adjustments	and separate meetings
change in communication	positive changes in communication within practice
engaged leaders increased communication	engaged superiors more likely to have an effect on communication
encourage discussions and ideas	leaders encouraged conversation and discussion around new ideas
increased meetings	more meetings occurring
efficient	smooth operations
meetings improve teamwork	meetings support discussion which improved collaboration
collaboration	staff members work together
results	accomplishments
adherence to care guidelines unimportant	practices not concerned with adherence to guidelines
patient care important	practices concerned with patient care issues
practice organizational improvements important	practices concerned with improvements to organizational issues
identify issues	all practices able to identify issues
address issues, some unresolved	all practices able to address issues although some remain unsolved
prescription refills problem	that communication around the issue of prescription refills was a persistent problem
unclear patient communication	practices unable to understand patient telephone messages for drug refills
clarification time consuming	staff spend time calling patients and physicians to understand message
tested solutions	test possible solutions
completed target in 6 meetings	only 6 RAP meetings to complete their first improvement target.
monitoring and evaluation	introduced monitoring and evaluation
issue management	meetings used to tackle further issues
meetings continued	sustaining meetings and other improvement activities
varied number or targets	each practice has own targets
meetings practice specific	meetings differed depending on practice and practice focus
solutions tested	practices tested possible solutions
improvements successful	improvements largely successful
incremental changes	some practices opted for small changes
intervention sites outperformed control sites	intervention sites performed better on almost every quality indicator
staff actions critical	staff actions proved to be more important and effective, outside of intervention
improved services,	better quality services
improved access to services	more accessible services
improved experience	better experience for client
more satisfied clients	clients happier with services
more educated clients	clients have improved knowledge of their personal health
intervention suggests	intervention provides suggestions, not
staff initiated improved client care	staff took it upon themselves to improve certain aspects of patient care
staff requested training	Limited short training requested by staff on various aspects of patient
intervention encouraged reflection	intervention has reflection aspects which encouraged staff to consider their actions with patients
working together	working together helped foster a critical mass
prompts	staff need prompts to provide quality service
lack tools or knowledge	staff often lack the tools or expertise required to provide quality service

lack motivation	staff often lack the motivation required to provide quality service
lack feedback	staff often do not receive feedback
intervention provided foundation	intervention provided a foundation for staff to work from
external stimulation provoked internal change	outsiders suggested ideas which encouraged internal action and change
ownership	staff's requirement to take ownership of problems and solutions enabled behaviour change
	Revision (article):
	ownership by staff encourages empowerment, sometimes resulting in behaviour change (Kirsh et al.)
support from superiors	superiors provided critical support and encouragement
client appreciation	staff aware of clients' appreciation of actions provided encouragement
poor prescribing	poor prescription practices at both intervention and control sites
skill and knowledge deficits	intervention cannot overcome some areas
resource constraints	drug shortages and outdated or lacking equipment constrain how staff can act
external support critical	staff need support from superiors and greater health community
adherence to complex regimes problematic	biggest obstacle identified as complex medication regimes
proposed solutions	several solutions identified
simplification	simplification of medication regime highlighted
patient focused solution	patient focused solutions are likely to be most successful
multifaceted problem	most problems have many factors which contribute to complication
patients requiring teams	most complex problems arise with patients who require a team of carers
incorrect communication	contacting patients unable to read by post, corrected by intervention
increased testing	intervention increased testing of patient diseases
mobility issues	intervention shifts services to take place in home for immobile patients
poor diabetes management	intervention identified gaps in care
lack of handover arrangements	the lack of careful handover arrangements for patients discharged from hospital
no arrangements made for followup	no planning for follow ups after discharge
no rehab arrangements	no rehabilitation plans for stroke patients after discharge
liaised other services	case manager liaised other services such as rehabilitation services or grief counseling
formal referrals	case manager enacted formal referrals
increased turnaround	intervention prioritized patients who were able to access services quicker
advocacy	case manager plays advocacy role
increase in diagnoses and coordinated services	intervention resulted in more diagnoses and services coordinate for patients
serious errors averted	intervention averted potential complications and crises
incorrect prescriptions	intervention corrected inappropriate and incorrect prescriptions
infections identified	several infections, such as UTI, were identified and addressed
hospital admission avoided	avoided an acute hospital admission by working with a social worker to organise a respite care bed
power issues impact equipment and increase hospital admissions	intervention created solution to power problems which previously drove patient to hospitals to take medication
avoided admission to acute	intervention reduced the number of needed beds

beds	
facilitated terminal care at home.	intervention facilitated care and home in accordance with patient requests
time constraints	too little time
work overload	too much work
busy urban setting	frantic setting
patients demanding redundant treatment	patients requesting familiar treatment
patient disconnect	patients unable to understand the concept of evidence based medicine
constant updating of evidence	EBM requires constant updating with the constant
uncertainty	unsure of what will happen
changing recommendations	constantly changing guidelines and recommendations make it difficult for physicians to stay abreast
jargon	physician are more familiar with practice than theory
outdated computers,	outdate and slow computers make research difficult
physician's age	physician's age may lengthen retrieval time, and contribute to computer difficulties
lack of physician's computer skills	physicians unable to retrieval information quickly
ease of databases	databases are simply to navigate
incentives	HMO and financial rewards provide incentives for care
continual learning required	physicians are required to constantly learn and refresh
increase patient and provided depression knowledge	management suggests to increase both patient and provider's knowledge about depression
increase access to evaluation and treatment	Both KP and VA recommend increased access to mental health evaluation and care
VA endorsed screening	Veterans Association endorsed screening for depression in primary care and referring all detected patients to mental health specialists
KP endorsed improved management	Kaiser Permante endorsed increased management of depression in primary care
positive reaction	QI teams reacted positively about QI measures
respect	Every when teams disagreed, they respected others' decisions
mostly followed protocol	teams all followed guidelines with few exceptions
pilot testing	Only the VA teams conducted pilot test cycles, and improved interventions
required further resources	all teams requested or investigated the use of further resources
communication with QI board	all teams communicated with their QI boards
individualized strategies	each team's intervention strategy was individualized
incorporated collaborative care model	strategies addressed key elements of the collaborative care model such as patient and provider education, detection, assessment, and case management
CTs implemented more planned strategies	CTs more successful than LTs in the number of implemented strategies
various costs of intervention	interventions varied in cost, depending on the strategy
various time required	interventions varied in time needed, depending on the strategy
results consist with literature	intervention results confirmed hypothesis generated bby the literature
positive support factors key	factors that might most affect the success of the QI process.
interdisciplinary team	positive support factor
support	positive support factor
engaged leadership	positive support factor
flexible problem solving	positive support factor
positive factors vary	Positive factors could vary across teams by design, because of poor adherence to the design, or because of natural differences

clinician majority	positive support factor
participation mandate	positive support factor
multiple stakeholders	positive support factor
LT more positive	LT reported more positively than CT
CT slight deviations	several CT interventions deviated from expectations
planning average of 4.5 months	planning average of 4.5 months
implementation average 6.5 months	implementation average 6.5 months
mostly successful	all but 1 interventions active post six months
reliance on computer medical record	two VA team interventions used computer medical records, which displayed screening results and provided feedback summary data
software terminated after one year	teams unable to continue intervention past one year as software was terminated
teams participated in improvement acuities	after intervention, teams participated in activities geared to quality improvement
VA-LT initiated new sustainable consultation system	created coordinate consultations system to deal with problems in the practice
staff shifting	intervention resulted in some staff shifting roles
QI leadership necessary for success	high ratings on interest in depression, content expertise, and participation noted for success
support necessary for success	high ratings on support from mental health specialty or clinical practice leadership noted for success
mixed views	polarized views on effectiveness of intervention
overall effective	intervention successful overall
improved patient care	key communication skills led to better care of patients
great satisfaction	key communication skills led to better satisfaction by patients
encourages communication	key communication skills encourage dialogue between patient and physician
understand patients	communication led physicians to better understand patients and how they understand antibiotics
bigger picture	both patient and physician have increased understanding of how antibiotics fit into larger picture
necessary human element	intervention provided much-needed 'human touch'
perceived as wasteful by smaller practices	smaller practices saw intervention as a waste of time and resources
general practice time constraints	general time constraints make it difficult to schedule communication
difficult to gather all staff at same time	hard to wrangle all intervention involved staff at same time as no one to run practices or deal with emergencies
interested in local resistance	intervention participants especially interested in local resistance rates
independent learning	online componant promoted independent learning on the part of participant
flexibility in access	online component made access flexible for participant
technical difficulties	six out of thirty-three practices experienced technical difficulties
older computer systems	technical difficulties
streaming delays inexperienced with IT	technical difficulties
pointless video	participants did not understand why they had to download a video which comprised of someone talking
inaccurate videos	videos portrayed ideal scenarios, not scenarios which would actually occur
up to date evidence	The presentation of up-to-date evidence was found to be extremely useful
useful guidelines	guidelines useful for patient consultations

spread to nurses	guidelines given to nurses seeing patients with minor illnesses.
guidelines accessible	guidelines available in accessible places, by phone, computer, etc
guidelines effective for questioning patients	guidelines can be a useful tool to help patients who question physician decisions
patients question antibiotic prescriptions	patients tend to question physican's decision to withhold antibiotics
accessible format required	can be used as an effective tool if in easy to read format
reflective exercises unnecessary	A fifth of interviewees reported that they did not see the merits of the reflective exercises
recording consultations unnecessary	A fifth of participants reported that they did not see the merits of recording their own consultations online
difficult to find cases	hard to find an interesting case to include
prompted reflections	intervention component of recording cases forced physicians to be reflective
increased processing	increased physicians understand and mental processing of a case
research evidence	most useful aspect of intervention
behaviour change	Ten interviewees reported that their prescribing behaviour had changed
increased awareness of local resistance rates	increased overall awareness of the antibiotic resistance issue
irrelevant evidence	negative feedback
online difficulties	negative feedback
failed components	negative feedback
increased education	positive support factor
improved expertise	positive support factor
more tools	positive support factor
identified categories	Data identified the following main catagories: implementing case management, implementing case management, disease-specific benefit, role perception and relationship to patients and GP.
case management supporting factors	the organization and practice team relate to each member of the team and to organizational practice issues.
organizational issues	wide range of practice-specific solutions for organizational issues
motivation and involvement influence attitude	Doctors' assistants' attitudes towards their new role as a case manager were influenced by their reason for participating and prior involvement
discussion positive	Those approached by GP through discussion responded positively
nominations negative	Those nominated by GP responded negatively
coercion negative	Nominated participants felt forced into situation
attitude change	Initial negative attitudes towards case management sometimes changed during the course of the intervention
time importance	time taken and available to accomplish them was important in its implementation
staffing issues	staff unable to complete all tasks as team members are needed in practice
unofficial overtime	staff have to work overtime to accomplish all tasks
increased understanding	GPs and assistants discuss each case, allowing for a greater understanding of the patients needs
team support	it is important that doctors' assistants received support from the whole practice team
staffing solutions	increased number of staff allow for staff to complete job tasks and additional intervention tasks
feedback valued	Assistants value feedback from GPs
shared responsibility	participants valued the shared nature of the management process
no support	If staff do not receive this support, implementing intervention within

	normal daily routine become difficult
underappreciated	Lack of support leads staff to feel like they are not appreciated
double burden	Without support, staff felt like they were performing GPs job too
mostly positive	participants responded positively
time and attention appreciated	participants were able to give patients more time and attention while implementing case management
satisfaction	appreciation also satisfied the needs and wishes of patients
being heard	patients felt their concerns acknowledged
the need to prove	patients valued the opportunity to show off their progress
minority negative	few participants responded negatively
poor patient motivation	poor motivation by patients resulting in suboptimal cooperation
collaboration unappreciated	patients do not value the process and team
elderly care issues	problems while performing the dementia tests
disconnect	staff felt that elderly patients were embarassed
perception problems	doctors' assistants perceived patients to be embarrassed when that may not have been the case
assumptions	staff assumed patients thought poorly about underperformance and that staff would think they were stupid
insecure	Some staff felt insecure in new or unforeseen situations with patients and that
unclear protocol	In unpredicted events, it was unclear where such events fitted in the case management protocol
emotional involvement	staff care for patients, concerned when there are discrepancies between suggested guidelines and reality
self doubt	Staff question their actions as they want best for patient
best practice	Staff want to follow best possible practice
emergence of new strategies	staff used new experiences to develop strategies to cope with severe situations
routine	a routine emerges are few times of
disease specific	staff used case management for patients in disease-related issues and patient outcomes
participants satisfied	participants satisfied with intervention results
disease specific management successful	case management was effective in improving disease-specific self-management
physical activity	emphasis on physical activity is translated into increased physical activity
motivation	patients become motivated to do better
medical understanding	patients develop a better understanding of their disease and self-awareness about its course
observation	greater observation of disease
personal improvement	reacts to observation
improve detection	intervention helped staff detect and address relevant disease-related patient problems:
personal habits	greater understanding of patients' personal habits
lack of initiative	intervention circumvents patients who may lack initiative
routine change	new intervention role for staff led to changes in their everyday routines
relationships	staff have changed relationships with patients and GPs
more intensive interaction	more intense interaction with patients
greater trust	patients tend to trust staff more, following intervention
care givers	staff are seen as caregivers by patients
continuity of care	staff become essential to community of care
change in regular practice	Patients started to seek consultations with the doctors' assistants
patient centered	patients become focus of care

backgrounds	better understanding of background
environment	better understanding of environment
enhanced context	overall improved understanding of patient and disease context
create guidelines	create general guidelines for intervention
translate into context	translate guidelines into local context
implementation fidelity critical	implementation fidelity is critical to achieving the levels of efficacy demonstrated in clinical trials
contextualizing	context specific information and details are necessary
lack guidance	intervention lacks implementation guidance
context needs	context highlighted as a need
diabetes focus	diabetes chosen as a focus for a number of legitimate reasons
foundation	strong clinical foundation for diabetes as focus
novelty	organizational structure open to novelty
flexibility	“considerable latitude” given to how mandates were achieved
mandate for action	supramacrosystem level promoting factor
burning platform	supramacrosystem level promoting factor
ability to pilot test	supramacrosystem level promoting factor
innovation	macrosystem level promoting factor
openness	mesosystem level promoting factor
quality improvement team	essential promoting factor
constrained resources	innovation-hindering factor
ability to alter relationships	innovation-hindering factor
disconnected groups	innovation-hindering factor
inability to document work	innovation-hindering factor
absence of guidelines	innovation-hindering factor
construction	innovation-hindering factor
displaced staff	innovation-hindering factor
concerns about relationships	innovation-hindering factor
need for monitoring and evaluation	innovation-hindering factor
SMAs disruptive	SMAs require complex changes that impact on care routines, collaborations, and various levels of the organization
implementers and champions critical	critical to make and implement the initial decisions
the more complex	personnel are essential for more complex implementation
implementers sustain	implementers assist in sustaining the intervention
interdisciplinary authority	authority hails from various related backgrounds
experience	personnel are heavily experiences
committed team	staff were strongly committed to working together
key stakeholders as staff	staff are all important stakeholders
further analysis needed	further analysis of the SMA beyond factors associated with the decision to implement needed for guidance to tailor intervention to the local context.
reference Grol	referenced Grol’s characteristics that might promote or hinder implementation processes
utility	critical to successful implementation
compatibility	critical to successful implementation
involvement	critical to successful implementation
collective action	critical to successful implementation
compatible with institution	intervention was compatible with the norms and values of the institution in promoting improvement in chronic disease quality measures
high team involvement	implementation team very involved
collective decision making	team met to collectively decide the specific details of the clinical

	experience
low compatibility with traditional visits	hindering factor
difficult to explain	hindering factor
primary care providers have no input	hindering factor
intervention tailoring	necessary tailoring of the intervention to local context
system redesign	negotiating system redesign necessary
fraught with issues	issues from start-up to sustainability,
identify and categorize problem	difficulty acknowledging and addressing problems
changes to SMA process	the SMA process for patients with diabetes has changed over the last two years.
system changes	changes clinical microsystem, mesosystem, and macrosystem levels
flexibility helps and hurts	prompting and hinder
strong team	promoting factor
offset implementation challenges	promoting factors used to offset challenges encountered during implementation.
vague description enabled adaptability	lack of clear designation of what the innovation and team members needed permitted the team to adapt the innovation to the local context and needs throughout the implementation process
emerged nutrition needs	patients wanted to discuss nutrition
documentation solutions	discovered and implemented template note to document progress
individual focused solution	ability to document individual treatment plans (customizable)
complexity of intervention	innovation and its implementation complex
vague clinical care	SMA was fist identified as a vague unknown type of clinical care
pilot testing	trial period with small numbers of patients to highlight success as well as allow clinic practitioners to sit in
identification and mitigation	pilot testing allowed for issue management
continuous tailoring	system redesign included continuous tailoring of intervention
continuous context adjustment	system redesign included continuous adjustment to context
referrals possible	ideal of encouraging referrals
conceptual issues	SMA confusing as concept within system
expand and integrate services	SMAs expanded and integrated other services and resources of the primary care clinics
patient responsibility	PCP still responsible for patient
recognition of expertise	recognizing the role of each participant and discipline's expertise
overlapping care	SMAs do not eliminate the clinical microsystem but provide another opportunity for care
potential undermining impact	SMAs may undermine provider-patient relationship.
system level issues	issues exist at each level of the care system.
windows of opportunity	timing is critical in implementation
changing priorities	changing priorities at the supramacro level
lack of success	increasingly difficult challenges when implementation is not successful
expand intervention	superiors want intervention expanded to other conditions and possibly other care sites
enacted change	intervention encouraged positive changes at various levels
performance pressure	primary care providers are experiencing pressure to meet performance measures of quality and productivity
overburdened resources	unable to accommodate all identified patients
unintended consequences	success of intervention burdened system
sustainability desired	increased number of referrals highlight need for sustainability
intervention valued	valued intervention means implementation and sustainability
increased referrals	intervention has value

teamwork important	a high degree of 'teamness”
unofficial overtime	team members rotate who puts in extra time
staff pitch in	all staff members pitch in with clerical duties and tasks as needed
weekly meetings	weekly meeting after each SMA continues to occur for discussion
open forum for discussion	all team members have an open forum to voice concerns and make group changes
shared ownership	shared governance
patient satisfaction	patients felt satisfied
patient education	patients felt more educated
patient care	patients felt cared for
required health promotion activities	PCU1: prenatal care, such as teaching pregnant women, assessment of nutritional status, assessment of mental condition, promoting nutrition for children to solve malnutrition problems, assessment of development in pre-school age and autistic children, assessment of nutritional status in school-age children, health education for various community groups, and an annual physical check-up
additional activities	PCU2: coordinating and supporting the community committee for health and quality of life development through organizing community activities, clean food/good taste, providing social support for specific patient groups
community focused	strong community focus on PUC2
supervisors eager to participate	
community pride	
reinforced health promotion activities	intervention reinforced existing practices
promote own health facilities	community leaders promoted health facilities in the community
greater openness required	need forum for feedback
improved outcomes	participation of the PCU officers and community leaders provided better community health promotion outcome
community activities	participation of the PCU officers and community leaders incorporated more community activities
greater participation belonging	participation of the PCU officers and community leaders elicited more participation and fosters a sense of belonging
changes post implementation	several changes occurred after supervisory model 1 was implemented
administration of supplies	changed post implementation
family folder use	changed post implementation
democratic approach	positive factor
problem solving as a team	positive factor
respect	positive factor
increased working knowledge	positive factor
increased report writing skills	positive factor
increased workload	negative factor
problem analysis	negative factor
problem solving	negative factor
conceptual disagreements within team	negative factor
participatory supervision progress issues	negative factor
over obligated	negative factor
changes in administration of supplies and other healthcare practices	changes occurred in the administration of the medical supplies and healthcare practices in the PCU
worked with community	positive factor

feedback	positive factor
for the community by the community	positive factor
increased community self development	positive factor
reduced discrimination	positive factor
greater participation	positive factor
serious participation by supervision	positive factor
open communication	positive factor
health problem identification	positive factor
locally driven solutions	positive factor
superior's role as focus	positive factor
slow start	negative factor
constructive adaptation	negative factor
great understanding of role	negative factor
conflict	negative factor
time issues	negative factor

Appendix 5 – Coding Guide

600	NEGATIVE PATIENT BEHAVIOUR
601	Inability to adhere to complex regimes
602	Lack of initiative
603	Poor understanding of health care
604	Reliance on incorrect information
605	Lack of mobility
606	Requirement for team of carers
607	Poor personal disease management
608	Request for redundant treatments

100	POSITIVE MANAGEMENT ENVIRONMENT
101	Support of management
102	Community pride
103	Leadership by management
104	Engagement by management
105	Interdisciplinary management
106	Ownership by management
107	Participation by management

200	NEGATIVE MANAGEMENT ENVIRONMENT
201	Absence of monitoring and evaluation
202	Overly strong management control
203	Attempt to assert management control
204	Superficiality of support
205	Absence of leadership
206	Lack of sincerity
207	Belittlement by management
208	Change of management priorities
209	Feared by staff
210	Coercion by management
211	Lack of guidance

300	STRUCTURAL OPTIMIZATION
301	Multidisciplinary team members
302	Insight into other hierarchy roles
303	Presence of team work
304	Even workload distribution
305	Quality improvement team members
306	Use of incentives
307	Committed team members
308	Key stakeholders as team members
309	Collective decision making

400	INABILITY TO OPTIMIZE
401	Unofficial overtime expected
402	Increased workload
403	Dysfunctional team
404	Unclear decision making rationale

500	POSITIVE PATIENT BEHAVIOUR
501	Interest by patients
502	Cooperation from patients

700	COMMUNICATION
701	Existence of open forum
702	Encouragement of discussion and ideas

800	LACK OF COMMUNICATION
801	Unclear patient communication
802	Lack of feedback
803	Breakdown of communication
804	Insufficient openness in communication

900	EXTERNAL COLLABORATION
901	Existence of referrals to collaborating facilities
902	Continuation of care
903	External stimulation as catalyst for change
904	External support

1000	POOR EXTERNAL COLLABORATION
1001	Lack of protocol adherence by collaborating facilities
1002	Lack of follow up arrangements
1003	Lack of handover arrangements

1100	POSITIVE SYSTEM ATTRIBUTES
1101	Disease-specific management

1200	NEGATIVE SYSTEM ATTRIBUTES
1201	Lack of existing systems
1202	Conflict between processes
1203	General practice time constraints
1204	Difficulty gathering staff at once
1205	Prescription protocol problems
1206	Logistical issues
1207	Use of jargon
1208	Busy urban setting
1209	Uncertainty
1210	Failure to keep abreast of continual medical updates
1211	Excessive flexibility
1212	Lack of provider involvement

1300	POSITIVE ASPECTS OF IMPLEMENTATION PROCESS
1301	Incremental nature of change
1302	Ability to exploit time-sensitive changes
1303	Ability to transform to context
1304	Perseverance in pursuing implementation goals
1305	"Burning platform"
1306	Ability to pilot test
1307	Continuous context adjustment
1308	Continuous tailoring

1400	NEGATIVE ASPECTS OF IMPLEMENTATION PROCESS
1401	Unclear protocol

1500	POSITIVE ASPECTS OF THE INTERVENTION
1501	Empowering of staff
1502	Holistic approach
1503	Patient-centered intervention
1504	Locally driven solutions
1505	Introduction of practice prompts
1506	Reinforcement of existing health promotion agenda
1507	Standardization of practice
1508	Simplification of practice
1509	Novelty of intervention
1510	Flexibility of intervention
1511	Community focus of intervention
1512	Innovation of intervention
1513	Compatibility with institution

1600	NEGATIVE ASPECTS OF THE INTERVENTION
1601	Degree of technical difficulty
1602	Perceived wastefulness
1603	Excess of steps and procedures
1604	Inability to optimize medication maintenance
1605	Flexibility of intervention
1606	Disruptiveness of intervention
1607	Inefficient time use
1608	Alteration of routine
1609	Requirement of team involvement
1610	Unrealistic components
1611	Ability to alter relationships
1612	Lack of focus

1700	POSITIVE STAFF ATTRIBUTES
1701	Sense of ownership
1702	Respect of peers
1703	High degree of motivation
1704	Positivity of attitudes
1705	Perception of appreciation
1706	Sense of significance

1800	NEGATIVE STAFF ATTRIBUTES
1801	Age of physician
1802	Lack of physician's computer skills
1803	Perception of under appreciation
1804	Ignores cognitive impairment as a barometer of health
1805	Emotional involvement with patient
1806	Sense of insecurity
1807	Avoidance of preventive measures
1808	Physician failure to act on positive screens
1809	Physicians apprehensive to admit younger patients
1810	Disconnect between expectations and presentations
1811	Physicians stereotype patients

1900	RESOURCE-RELATED CONSTRAINTS
1901	Increased resource use
1902	Outdated equipment or technology
1903	Insufficient resources

2000	NEGATIVE HUMAN RESOURCES ATTRIBUTES
2001	Lack of training
2002	Lack of tools
2003	Lack of motivation
2004	Skills and knowledge deficits

2100	POSITIVE HUMAN RESOURCES ATTRIBUTES
2101	Continuous education
2102	Regular meetings

Appendix 6-001: Coding

Level One Coding, Article 001

Label	Text
enabling factors, support from and sponsorship by management, leadership of management, efficiency, collaborating facility, continuous education, effective time scheduling, multidisciplinary team members, expansion of treatment	Main contributors to the success of the program included executive support and sponsorship, the leadership and composition of the ACM committee, systematic identification and assignment of patients, the LPN-run blood-pressure clinic, continuous education efforts, dedicated panel-management time, use of a multidisciplinary team, and expansion of treatment of patients with DM beyond glucose control to include blood-pressure and lipid-level management.
accountability, possible constrainers due to lack of existing systems, no monitoring and evaluation for management, even workload distribution, referrals not following workflow protocol, conflict between differing processes	Patient panel assignments to care managers helped create accountability for the total patient population and their care gaps. However, no system was in place to generate care-manager-specific outcome and productivity data reports. In addition, as seen in Table 3, although patient workload distribution was clearly structured, problems arose when PCP referrals deviated from the established work flow. These deviations occurred when PCPs were learning the new work flow or were more comfortable with their prior in-office referral processes.
increased access due to coordinated facilities, increased efficiency, coordinated facilities, more time efficient and increased level of care	The LPN-run blood-pressure clinic increased access to screening without a copay. Increased blood-pressure measurement opportunities enabled a more rapid medication-titration process. Also, the adoption of a strictly LPN-run clinic freed time in the RNCM schedule to engage in disease management.
changing roles and processes, increased education, increased awareness of standards, standards review meetings, interdisciplinary team meetings, patient education by staff, varied class content	Because many shifts in roles had occurred and a new process was being implemented, a strong emphasis was placed on education of the entire disease-state-management team. These efforts were repeated in multiple forums and venues. Algorithms, national guidelines, and standards of care were distributed and reviewed at physician, pharmacist, and RNCM team meetings on an ongoing basis. These concepts were again reviewed at interdisciplinary team meetings. Patients were also educated through group diabetes classes led by either a member of the PCM team or an RNCM and registered dietitian. Classes addressed diet and lifestyle changes, medication management, and disease-state progression.
increased efficiency and support, support from physicians, reduced	Panel-management time assisted in gaining physician buy-in and reduced the burden of increased DM-related in-basket messages.

workload unintended improvements in disease management	Although over time, it was found that panel-management time was not always strictly used for DM disease-state management, it did consistently allow physicians to feel more comfortable with integrating more disease management into their daily work flow.
programme measure needs improvement, needs holistic approach, new programme is improved, focus on overall diabetic goals, negative consequence of less care on other chronic diseases, affects outcomes	One of the components most important to the improvement in HEDIS measures and patient care came from the strategy of treating all parameters of the patient with DM. Before the initiation of this program, less emphasis was placed on the control of blood pressure and lipid levels in patients with DM; care centered on lowering blood-glucose levels. With the use of the ALL mnemonic, emphasis shifted from a glucose-centered approach to one that started and titrated all applicable medications to reach comprehensive diabetic goals. However, as a consequence of the focused effort on diabetes care in 2008, less focus was placed on several other chronic diseases. Thus, not all 2009 HEDIS measures showed as large of an improvement as the DM related measures.
successes and limitations, no demographic data available, unclear on demographic impact on results, unclear causality, article focus different to goal, long term cost fall, programme is cost saving, increased resources could mean increased cost, short term cost rise, inconclusive costing	Despite the improvement seen in diabetes care, several limitations to this analysis exist. First, no demographic data for the cohort were available for collection. Therefore, it is unclear what role changing demographics might have had on the reported results. KPOH is currently implementing a process for demographic data collection. Second, the goal of this article was to describe the efforts and results of a multidisciplinary disease-state-management team, not to analyze cost savings or financial implications of such an intervention. Although we do believe that a strong DM-management program does decrease long-term health care costs, this hypothesis cannot be validated by the current analysis. It is possible that because of increased screening, medication dispensing, and DM-related office visits, short-term costs may have increased in the KPOH region, but those data were not analyzed.
programme successful in uptake, increased adoption, teamwork has positive effects, increased communication, increased understanding pride and satisfaction not validated,	Because of the success of this program, DM disease management has been integrated into daily work flows. In addition, the multidisciplinary approach to disease-state management has expanded to include hypertension, coronary artery disease, chronic obstructive pulmonary disease, and asthma. Increased teamwork has led to improved communication between departments and a greater understanding of each discipline's strengths. The opportunity to provide more effective diabetes care has fostered a personal connection and sense of increased job satisfaction, although

	no employee surveys were administered to validate these findings.

Level Two Coding, Article 001

SUPPORT OF MANAGEMENT:
- support
- sponsorship

GUIDANCE OF MANAGEMENT
- leadership
- efficiency

CONTINUOUS STAFF TRAINING
- continuous education

EFFECTIVE TEAMWORK
- multidisciplinary team members
- even workload distribution

IMPROVED SERVICES
- expansion of treatment
- accountability
- effective time scheduling

EXTERNAL COLLABORATION
- collaborating facility

<u>IMPLEMENTATION BARRIERS</u>
EXISTING UNDER DEVELOPED ENVIRONMENT
- lack of existing systems

SYSTEM
- no monitoring and evaluation for management

UNCOOPERATIVE EXTERNAL COLLABORATING INSTITUTIONS
- referrals not following workflow protocol
- conflict between differing processes

<u>INTERVENTION RESULTS</u>
COLLABORATION MATTERS
- increased access due to coordinated facilities
- increased efficiency
- coordinated facilities

IMPROVED EFFICIENT QUALITY OF CARE
- more time efficient
- increased efficiency
- increased level of care

INCREASED UNDERSTANDING OF QUALITY OF CARE
- increased education
- increased awareness of standards

IMPROVED WORK ENVIRONMENT
- changing roles and processes
- standards review meetings

- reduced workload
- varied class content

OWNERSHIP
- pride and satisfaction (not validated)

STAFF RELATIONSHIPS WITH EACH OTHER
- interdisciplinary team meetings
- teamwork has positive effects
- increased communication
- increased understanding
- increased support

PATIENT ATTENTION
- patient education by staff

SUPPORT FROM PHYSICIANS
- support from physicians

- EVALUATION MEASURES REQUIRE FURTHER ATTENTION
- programme measure needs improvement
- new programme is improved

INTERVENTION IS DISEASE SPECIFIC
- focus on overall diabetic goals
- unintended improvements in disease management

INTERVENTION MUST ALSO FOCUS ON OVERALL HEALTH
- negative consequence of less care on other chronic diseases
- affects outcomes
- needs holistic approach

<u>INTERVENTION LIMITATIONS</u>
LIMITATIONS OF STUDY: LIMITED INFORMATION
- no demographic data available
- unclear on demographic impact on results
- article focus different to goal

INTERVENTION EFFECTIVENESS QUESTIONABLE
- unclear causality

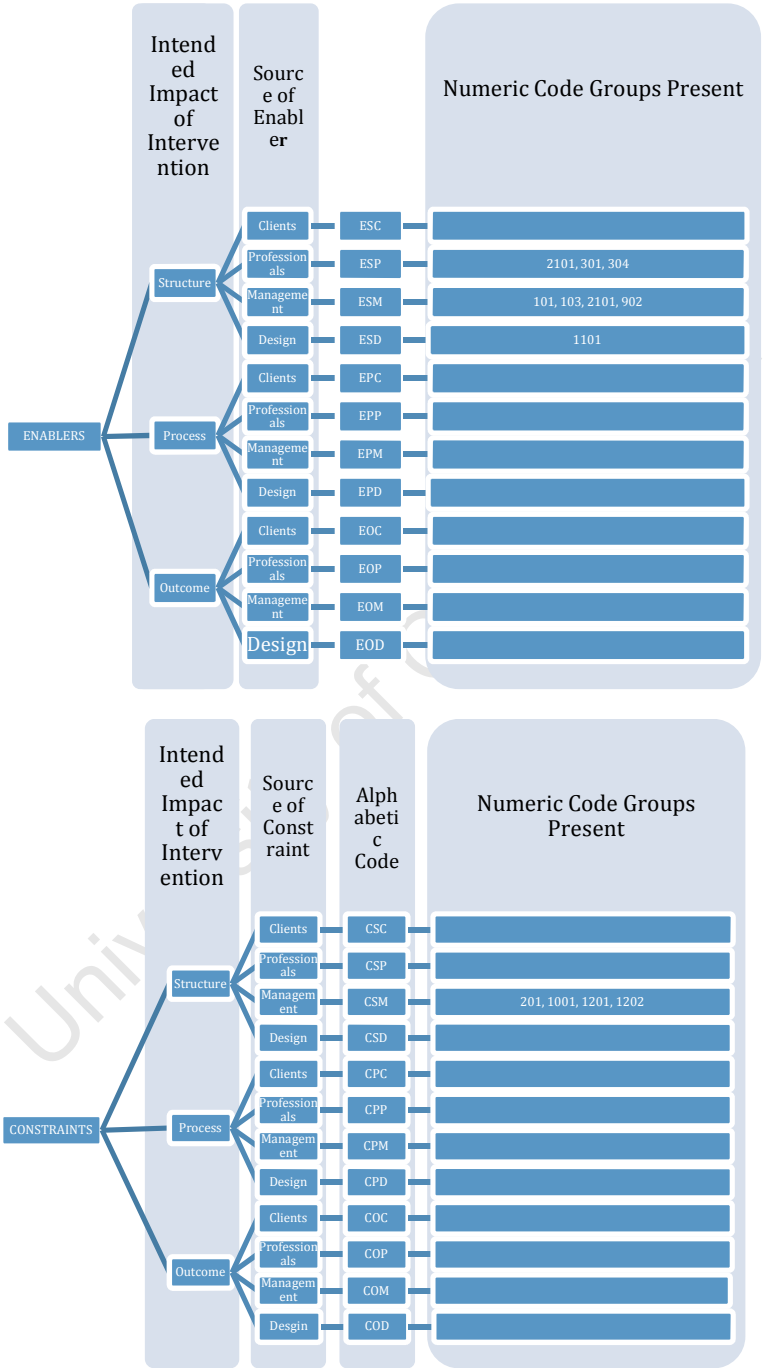
INTERVENTION INCREASED RESOURCE USE
- increased resources could mean increased cost
- short term cost rise
- inconclusive costing

Level Three Coding, Article 001

ENABLERS
SUPPORT OF MANAGEMENT - 101 GUIDANCE OF MANAGEMENT - 103 CONTINUOUS STAFF TRAINING - 2101 EFFECTIVE TEAMWORK – 301, 304 EXTERNAL COLLABORATION - 902 INTERVENTION IS DISEASE SPECIFIC - 1101
CONSTRAINERS
SYSTEM/ LACK OF M+E - 201

UNCOOPERATIVE EXTERNAL COLLABORATING INSTITUTIONS – 1001, 1202
EXISTING UNDERDEVELOPED ENVIRONMENT – 1201

Visual Account of Coding:



Appendix 6-002: Coding

Level One Coding, Article 002

Label	Text
did not meet before intervention, intervention summoned team meetings, meetings identified areas for improvement regularly attended meetings, mitigated lost charts, tracked chart pathways, eliminated lost “hot spots”, changed chart protocol, effective time scheduling, reduced patient wait time, increase communication, addresses tension	Despite this lack of meeting history, 18 out of 25 intervention practices were successfully able to convene RAP teams, identifying and addressing potential areas of improvement. These practices each held at least 10 RAP meetings with regular attendance by members representing different parts of the practice and collaborated in brainstorming, planning, and implementing change. For example, in practice 58, the RAP team addressed the problem of missing patient charts. To address this problem, they tracked chart pathways through their office, drawing on cross-practice representatives to understand the reasons for pulling and transporting charts. Using this information, the team piloted strategies for eliminating "hot spots" of temporary chart loss and changing how charts were handled. In practice 47, the RAP team addressed the issue of keeping physicians on schedule to reduce patient wait time. The RAP team worked together to create a dialogue between team members and physicians who were not on the team. By doing so, they were able to surface and address unacknowledged tensions that had plagued the practice for some time.
7 unsuccessful no teamwork controlling leader preservation of control counter productive team members give up public private disconnect dysfunctional	Seven practices (of 25) were unsuccessful at engaging in the RAP process. In each case, a key leader, primarily the physician member dominated the meeting agenda. In 3 practices, lead physicians or office managers refused to relinquish control of the meeting agenda by directing conversation or shutting down critical areas of reflection. For example, in practice 34, the lead physician and office manager operated as a faction, working together to shut down topics they disliked and preserve their control of the agenda. Other team members attempting to introduce discussion of practice problems eventually gave up in the face of this tag team opposition. In practice 14, the lead physician publicly supported RAP to the research team, but in private, resisted it, first attempting to withdraw and later subverting discussion. Consequently, the team could not function effectively despite the support of the office manager.
staff hesitant to speak out, fear of superiors barrier, belittlement, negative reinforcement, communication breakdown, lack of safety, barrier, fear of superiors	Staff hesitance to speak in presence of practice leaders out of a concern of not being taken seriously or fear of belittlement was another factor in practices’ being unsuccessful at engaging in RAP. For example, in practice 35 when staff shared an experience of "...[and] I get flustered," the office manager responded with, "Yeah, you do. You really do." This reinforced the notion that the practice’s problems were the fault of the staff rather than systemic issues to be addressed by the team as a whole. Team members learned quickly and stopped talking; thus, lack of safety became a barrier to staff participation in the change process. In practice 42, team members were reluctant to speak. When the facilitator questioned the team about their reticence, only a single person replied, saying that she spoke up in RAP meetings because "others are afraid to...they fear retaliation if they go against [the doctor’s] vision of how things should be or if they are critical."
superficial support from superiors,	In 2 practices there was only superficial support from physician leaders. For example, practice 15 had only 4 RAP

absent leadership, going through motions	meetings at which time the office manager mentioned that they had accomplished their goals. Also, the physician leader was absent for 3 of these meetings. Thus, the practice RAP team went through the motions of implementing the intervention, but only superficially.
all identified and set improvements, almost half continued, implementation timing essential, organization, intervention valuable, intervention valuable for problem solving and decision making, intervention valuable after time period, increased communication, empowering, problem solving, increased understanding sustained interventions made adjustments example: rotation example: separate meetings	All 18 practices that engaged in RAP were able to identify improvement targets and make changes. Furthermore, 8 of these 18 practices continued using RAP in some form through the 2-year follow-up data collection point. Most practices that sustained the intervention were at a turning point when RAP was introduced. They used the intervention to organize themselves and, with time, found the process valuable in problem solving and decision making. For example, in practice 17, 1 physician was buying out the practice at the time that RAP was introduced. This physician leader was supportive of the group process and cognizant that her involvement should not "stifle the conversation." Also, 2 years after the intervention ended, practice members saw value in continuing to meet, as noted in the following quotes: "This helped us learn how to communicate better," "this was empowering," "meetings helped teach us how to problem solve," and "I learned to stop and understand the process." Practices that sustained the intervention often adjusted the structure and format of RAP meetings by adapting the process to their own specific needs. For example, practice 10 introduced a process of rotating RAP team members every 4 to 5 months to ensure that all members of the practice would be represented. Practice 17 transitioned its RAP meetings into separate physician and staff meetings but continued to incorporate elements of the process to preserve practice-wide involvement in problem solving.
change in communication engaged leaders increased communication encourage discussions and ideas increased meetings efficient meetings improve teamwork collaboration results	There was evidence of changes in practice-wide communication after the intervention. In 12 of the 18 practices that had engaged in the RAP process, 1 or more practice members reported improvements in practice-wide communication as a result of RAP. Members of practices in which lead physicians remained engaged in RAP and encouraged discussions were especially likely to report improvements in communication. For example, throughout the RAP process in practice 39, the lead physician encouraged discussion, inviting new ideas and refocusing the group whenever conversations strayed too far from the problem at hand. The team eventually expanded to include staff from a second office that had recently been purchased by the lead physician. When asked about the value of RAP meetings, the lead physician explained that, ...meeting once a week has made our practice run so much smoother. We were having problems a year ago between the offices, but they've almost disappeared now. We make sure that new people always come to the meetings right away. They make people better at teamwork. This fosters collaboration. We use it to get a lot accomplished.
adherence to care guidelines unimportant	The range of improvement targets on which RAP teams chose to work are described in the Table 1. Interestingly, not a single practice focused on improving adherence to clinical care guidelines. Most practices targeted patient care–related issues (eg, improving charting or access to practice) or practice-

patient care important practice organizational improvements important identify issues address issues, some unresolved prescription refills problem unclear patient communication clarification time consuming tested solutions, monitoring and evaluation, completed target in 6 meetings issue management, meetings continued	level organizational improvements (eg, easing staffing issues, leadership, or cross-practice communication). All teams were able to generate lists of their core issues and subsequently address 1 or more of them, although not all issues were resolved. For example, the RAP team at practice 17 noted that communication around the issue of prescription refills was a persistent problem. First, the team diagrammed the prescription refill process by observing it in real time and collecting data to assess where the process broke down. The team then concluded that patient telephone messages requesting prescription refills were often unclear, missing dosages or misspelling drug names. As a result staff members spent precious time trying to contact the patient or his/ her physician to obtain detailed and accurate information. To address this problem, the team pilot-tested potential solutions until they found a strategy that reduced the number of unclear prescription refill messages. They also designed a plan to continue measuring improvements every other month to find out whether the improvements were sustained with time. This practice used only 6 RAP meetings to complete their first improvement target. Subsequent RAP meetings were used to tackle other issues related to communication improvement and structural reorganization. The team continued to meet after the initial facilitated 12-week period, sustaining improvement activities over the entire 24-month observation period.
varied number or targets meetings practice specific solutions tested improvements successful incremental changes	The number of improvement targets addressed during RAP meetings also varied considerably across practices. For instance, practice 39 identified new improvement targets at each meeting, brainstormed potential solutions, and pilot tested them during the ensuing week. Based on the outcomes of this testing, changes were implemented. This practice took on 2 to 3 new issues every week, and by the end of the 12-week process they made improvements in many areas. On the other hand, practice 17 took on 2 major practice-wide issues (communication improvement and structural reorganization) and used weekly RAP meetings to gradually plan incremental changes that were instituted throughout the practice and that led to improvements in both areas. In essence, practice 17 operated from a systems perspective, whereas practice 39 preferred to address problems as they emerged.

Level Two Coding, Article 002

REGULAR MEETINGS IMPORTANT
- did not meet before intervention,
- intervention summoned team meetings
- regularly attended meetings
- efficient

MEETINGS INCREASE COMMUNICATION
- change in communication
- increased meetings
- example: separate meetings
- meetings improve teamwork

ENGAGED LEADERS INSPIRE
- engaged leaders increased communication
- encourage discussions and ideas

PATIENT-ORIENTED RESULTS
- effective time scheduling
- reduced patient wait time
- increase communication

BETTER WORKPLACE
- addresses tension

INTERVENTION VALUABLE
- intervention valuable
- intervention valuable for problem solving and decision making
- intervention valuable after time period
- increased communication
- empowering
- problem solving
- increased understanding

UNCOOPERATIVE STAFF
- counter productive
- no teamwork
- team members give up
- public private disconnect
- dysfunctional

CLINICAL HIERARCHY
- lack of safety
- staff hesitant to speak out
- fear of superiors

MANAGEMENT BULLIES
- belittlement
- negative reinforcement
- communication breakdown

ABSENT LEADERSHIP
- superficial support from superiors
- absent leadership
- going through motions

NEED FOR CONTROL
- controlling leader
- preservation of control

INTERVENTION RESULTS
- increased communication
- empowering
- problem solving
- increased understanding
- example: rotation
- collaboration
- results
- tested solutions
- monitoring and evaluation
- completed target in 6 meetings

PATIENT CARE FOCUS
- adherence to care guidelines unimportant
- patient care important

ORGANIZATIONAL PROBLEM SOLVING
- organization
- meetings identified areas for improvement
- issue management
- practice organizational improvements important
- identify issues
- address issues
- some unresolved
- solutions tested

ISSUES WITH PRESCRIPTIONS
- prescription refills problem
- unclear patient communication
- clarification time consuming

LOST CHARTS MITIGATED
- mitigated lost charts
- tracked chart pathways
- eliminated lost "hot spots"
- changed chart protocol

INTERVENTION ADOPTED
- all identified and set improvements
- almost half continued
- meetings continued
- varied number of targets
- meetings practice specific
- improvements successful

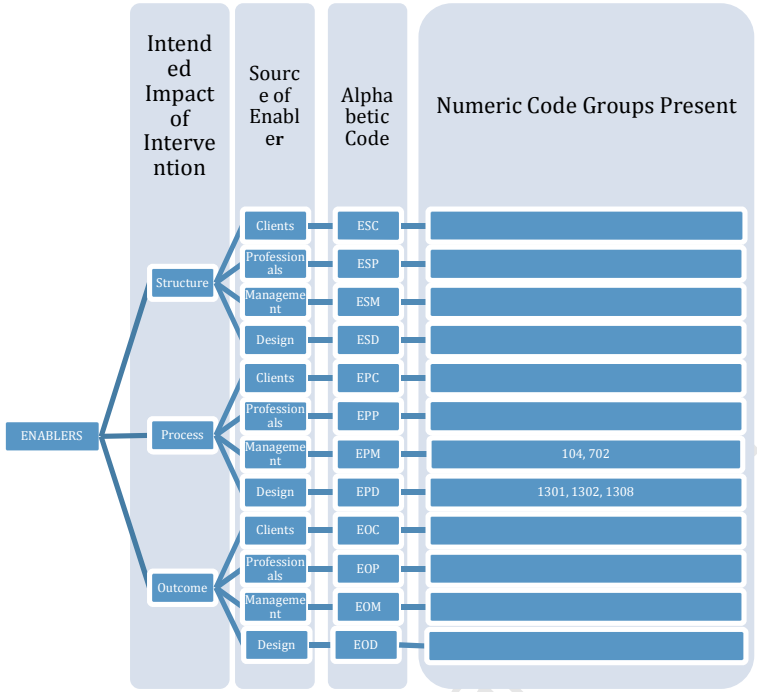
IMPLEMENTATION TIMING
- implementation timing essential
- incremental changes

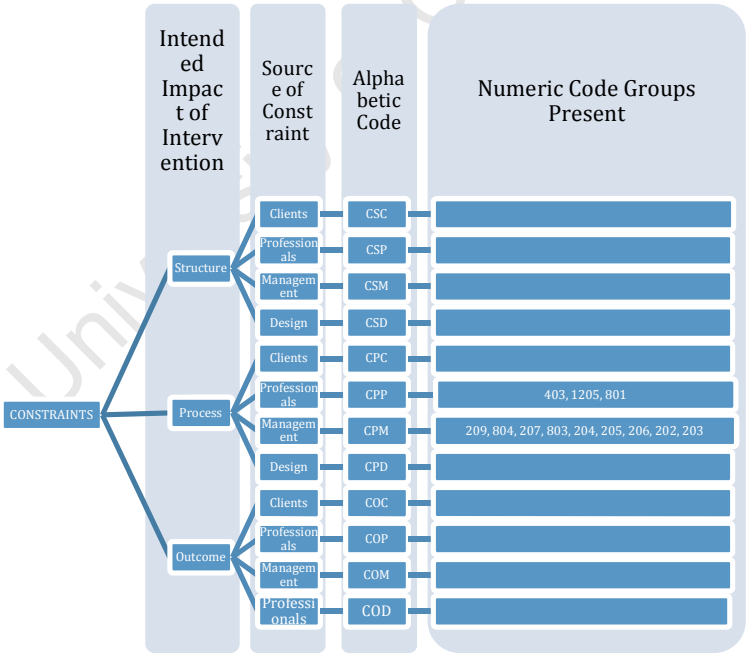
INTERVENTION TAILORING
- sustained interventions made adjustments

Level Three Coding, Article 002

ENABLERS
ENGAGED LEADERS INSPIRE – 104, 702 IMPLEMENTATION TIMING – 1301, 1302 INTERVENTION TAILORING - 1308
CONSTRAINERS
UNCOOPERATIVE STAFF - 403 CLINICAL HIERARCHY – 209, 804 MANAGEMENT BULLIES – 207, 803 ABSENT LEADERSHIP – 204, 205, 206 NEED FOR CONTROL – 202, 203 ISSUES WITH PRESCRIPTIONS – 1205, 801

Visual Account of Coding:





Appendix 6-003: Coding

Table 4: Level One Coding, Article 003

Label	Text
mixed views overall effective improved patient care great satisfaction encourages communication understand patients bigger picture	*Evaluating the STAR Educational Program* *Communication skills examples* In evaluating the contents of the program, rather than its reported effects, views were sometimes polarised. The presentation of key communication skills was described either in terms of new, useful and exciting, or as old and familiar, though perhaps in need of 'brushing up'. In either instance, however, implementing these skills was acknowledged as leading to better patient care and, ultimately, greater personal satisfaction: I think the communication skills aspect was good, being able to ask patients what they feel about antibiotics and to have a more adult conversation about it ... it sort of encourages you not just to be defensive and [say] 'we don't want to prescribe' but be proactive ... asking the patients what they felt was the benefit of taking antibiotics and what did they think they were going to get out of it .... and sort of telling people it is a self-limiting illness, some of those skills I thought was very good and make it much easier to prescribe the way I'd like to. (GP 229)
necessary human element perceived as wasteful by smaller practices increase communication general practice time constraints difficult to gather all staff at same time interested in local resistance	*The seminar* Respondents viewed the seminar as providing a much-needed 'human touch', although a small number of interviewees, especially those working in single-handed or very small practices, considered it a waste of time and money. Participation in the program seminar was also presented as a unique chance to focus on a particular issue and to increase communication within the practice team: ... the trouble is in general practice you don't have time to sit and talk and [it's] usually sort of a business practice meeting we don't often have clinical sort of where we actually discuss and necessarily change or discuss the pros and cons of various things on a regular basis. I'm not saying we don't ever talk about things at all, we communicate quite well, but it's finding the time to do it. (GP 161) Seminar trainer feedback indicated that it proved difficult at times to gather all the trial participants from a particular practice at a particular time, with the absence of practice nurses, who are often in charge of minor illness (telephone) triage, especially commented upon. Overall, however, trainers described the seminar discussions as lively, with participants most eagerly engaged in discussing local resistance rates as correlated with

	own practice data.
independent learning flexibility in access technical difficulties older computer systems streaming delays inexperienced with IT pointless video inaccurate videos	*The online training* The online aspect of the training was generally evaluated positively, with a particular emphasis on its promotion of independent learning and flexibility in accessing the program. However, six out of thirty-three practices experienced (initial) technical difficulties and especially in practices with older computer systems, or for clinicians less comfortable with IT, delays in video streaming and inability to access the program depending on certain computer settings could lead to frustration: ... there was a kind of pointlessness about the use of the technology, having video streaming that just made it irritatingly slow to download and it didn't contribute anything, and you'd actually watch a videotape of somebody *talking*, I would just as soon have *read* the text to be honest. (GP 171) Finally, some participants found the video material lacking in authenticity: ... there was some amusement during the video consultation with the various patients and doctor scenarios because it all seemed to go so beautifully according to plan and the patients never argued and there was lots of time and I thought - we all discussed that and we thought it was rather amusing, we didn't think it was totally realistic. (GP 207)
up to date evidence useful guidelines spread to nurses guidelines accessible guidelines accessible	*Research evidence and guidelines* The presentation of up-to-date evidence was generally seen as one of the most useful aspects of the STAR Program. Participants described how they discussed the modified Centor clinical scoring tool for managing sore throat, as well as the prescribing guidelines and evidence summaries with patients during consultations: ... you gave us guidelines on- primary care guidelines that have been very useful actually. Again, we've given our nurses copies of those to have a look at when they are seeing patients with minor illnesses. You know, I think no one has given them training in good antibiotic prescribing so I do think they over-prescribe, even though they're very good. I think those guidelines have been quite helpful, in fact we keep them pinned up by the uh, when they're doing nurse triage we keep them pinned up by the phone, so they can refer to those. (GP 248) ... the Centor guidelines, the other guidelines, can't remember what they were called now, the ones for the sinusitis and things you know, those I actually have them on my desktop. So what I do

guidelines effective for questioning patients	is I just put them on if I get someone stroppy ... just put them on and turn the screen and say 'read that, that's the guidelines we've got', because if you've given them an examination and you know they haven't got a temperature and they haven't many chest signs ... On the whole they tend to sort of 'oh okay' then, it's on the screen so it must be true and they see that's it's, you know, it's an official document. (GP 256)
patients question antibiotic prescriptions accessible format required	As evident from seminar trainer feedback as well as interview data, and in line with the 'computer-says-no' scenario presented in the above data excerpt, STAR participants repeatedly requested antibiotic resistance information leaflets or posters that can be displayed in surgery waiting rooms. Interviewees noted that presentation of the research evidence and guidelines in this more generally accessible format could have provided them with an added tool, and they expected it to be part of the overall program.
reflective exercises unnecessary recording consultations unnecessary difficult to find cases prompted reflections increased processing	*Case studies and self-reflection* About a fifth of interviewees reported that they did not see the merits of the reflective exercises or recording their own consultations online: I: ... and what did you think was the least useful GP: I think finding my own cases to put in. I don't know there's plenty of cases you could have found. It was hard to find an interesting one. But in terms of looking at that it didn't really affect what I was doing in any way, it was just a bit time consuming. That was a bit of a chore. (GP152) However, one of these participants, unprompted, addressed his own reservations on this issue, thereby aligning himself with the majority standpoint: ... the tasks of recording some of one's own consultations ... I don't know whether recording them had any benefit over simply thinking about them. Obviously recording them takes up a bit more time, but having said that I don't know if I didn't have to record them whether I'd really spend time ((laughs)) thinking about (those cases). It felt frustrating at some level but I'm well aware that that sort of thing does actually improve one's processing of it. (GP216)
research evidence	*Overall evaluation of key STAR components* The core aspects of the STAR Program considered 'most useful' and reported by these sampled participants as responsible for influencing their prescribing most were the research evidence and guidelines provided in the program, and the online communication skills examples, both of which were explicitly mentioned by 12 of

behaviour change increased awareness of local resistance rates irrelevant evidence online difficulties failed components increased education improved expertise more tools	the 31 interviewees. Ten interviewees reported that their prescribing behaviour had changed because of the increased overall awareness of the antibiotic resistance issue that results from working through the program as a whole, with four of those singling out the impact of discussing local resistance rates during the STAR seminar. In contrast, there were also respondents who considered the research evidence not directly relevant to their own clinical practice, or found it too difficult to process online. Moreover, the web forum, originally envisaged to become an ongoing learning resource, was dismissed by many as irrelevant, a format participants could not or would not engage with, even if their busy working lives would allow them time to do so. However, it was clear that all interviewed study participants subscribed to the view summarised by GP 207 as follows: ... overall I think it's just the being better educated and having therefore more clinical expertise and [the] communication tools to prescribe appropriately, treat appropriately, and therefore give better patient care, which is the bottom line. (GP207)

Level Two Coding, Article 003

INTERVENTION IS PATIENT FOCUSED
- understand patients
- bigger picture
- necessary human element
- flexibility in access

INTERVENTION ENCOURAGES COMMUNICATION
- encourages communication

STAFF KEEN TO LEARN
- interested in local resistance
- independent learning

WORK
- general practice time constraints
- difficult to gather all staff at same time

INTERVENTION INCLUDES UNNECESSARY ELEMENTS
- reflective exercises unnecessary
- recording consultations unnecessary
- perceived as wasteful by smaller practices

INTERVENTION'S TECHNICAL FORMAT PROBLEMATIC
- technical difficulties
- older computer systems
- streaming delays
- inexperienced with IT

- pointless video
- online difficulties
- failed components
- difficult to find cases

INTERVENTION CONTENT NOT REFLECTIVE OF REALITY
- inaccurate videos
- irrelevant evidence

MIXED INTERVENTION RESULTS
- mixed views
- overall effective

MORE EFFECTIVE PATIENT CARE
- more tools
- improved patient care

PERSONAL APPROACH TO CARE
- prompted reflections
- increased processing
- behaviour change
- great satisfaction
- increase communication
-

INCREASED STAFF EDUCATION
- increased awareness of local resistance rates
- increased education
- improved expertise
- research evidence

ADDITIONAL RESOURCES FOR STAFF
- up to date evidence
- useful guidelines
- guidelines accessible
- guidelines accessible

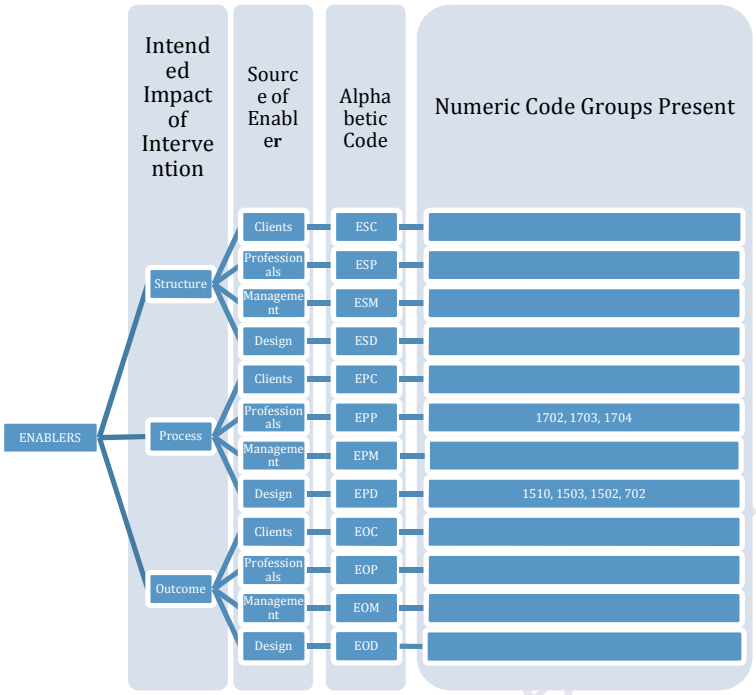
PATIENT ATTENTION
- guidelines effective for questioning patients
- patients question antibiotic prescriptions
- accessible format required

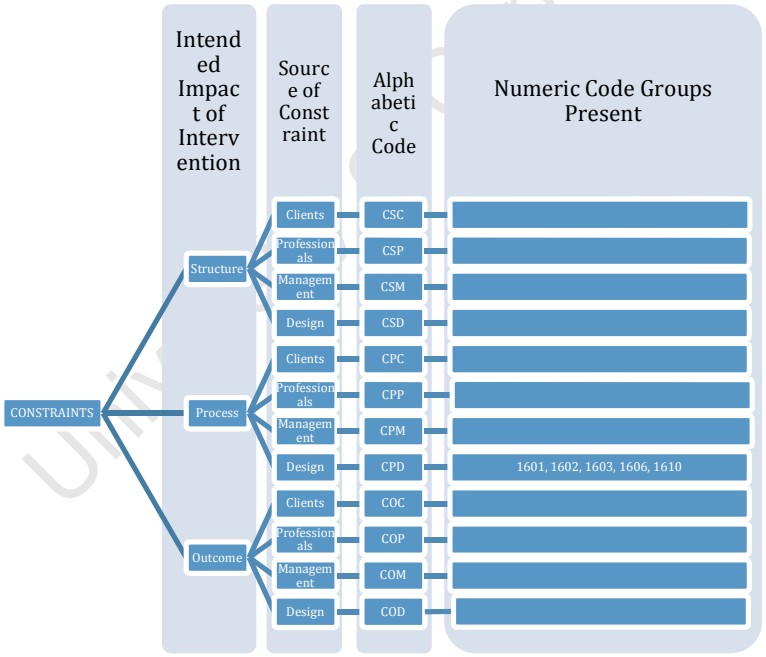
INTERVENTION ADOPTED BY NURSES
- spread to nurses

Level Three Coding, Article 003

ENABLERS
INTERVENTION IS PATIENT FOCUSED – 1510, 1502, 1503 INTERVENTION ENCOURAGES COMMUNICATION - 702 STAFF KEEN TO LEARN - 1702 WORK – 1703, 1704
CONSTRAINERS
INTERVENTION INCLUDES UNNECESSARY ELEMENTS - 1602, 1603 INTERVENTION'S TECHNICAL FORMAT PROBLEMATIC – 1601, 1606 INTERVENTION CONTENT NOT REFLECTIVE OF REALITY - 1610

Visual Account of Coding:


Intended Impact of Intervention
Source of Enabler
Alphabetic Code
Numeric Code Groups Present
ENABLERS
Structure
Process
Outcome
Clients
Professionals
Management
Design
ESC
ESP
ESM
ESD
EPC
EPP
EPM
EPD
EOC
EOP
EOM
EOD
1702, 1703, 1704
1510, 1503, 1502, 702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Source of Constraint
Alphabetic Code
Numeric Code Groups Present
CONSTRAINTS
Structure
Process
Outcome
Clients
Professionals
Management
Design
CSC
CSP
CSM
CSD
CPC
CPP
CPM
CPD
COC
COP
COM
COD
1601, 1602, 1603, 1606, 1610

Appendix 6-004: Coding

Level One Coding, Article 004

Label	Text
time constraints, work overload, busy urban setting, and patients demanding redundant treatment patient disconnect	Facilitators and participants perceived barriers to implementing EBM at the point of care were time constraints, work overload, a busy urban setting, and patients demanding redundant treatment (F#4): " I have 60 people in the waiting room...I'm not going to give a patient a long lecture on why it's no longer necessary to treat every Streptococcus with an antibiotic. It takes much more time to explain EBM than to simply write out a prescription."
constant updating of evidence uncertainty changing recommendations	Moreover, PCPs perceived constantly changing evidence as hindering the practice of EBM. Physicians felt that frequent changes in treatment recommendations as a result of new evidence created uncertainty for patients and physicians alike (F#10): "We regard the results of randomized control trials as the absolute truth. But the 'truth' keeps on changing. Look at Beta-Blockers or Hormonal Replacement Therapy...These ever- changing recommendations are really hard for my patients and I to swallow...It was a lot easier back then when medicine was based on instinct and experience."
jargon, lack of physician computer skills, outdate computers, physician's age	Additional barriers consisted of textbooks bereft of EBM jargon, physicians' scant computer and information retrieval skills, and slow computers. A number of participants felt the doctor's advanced age to be a barrier to understanding EBM concepts and utilizing online EBM resources (P#18): "I'm 59 years old. You can't compare me with them (young physicians)... I don't think as fast as I used too; I'm not as capable with the computer either... After the first session I was really devastated... I went home and cried."
ease of databases, incentives, continual learning required	Enabling factors included the ease of use of medication databases and HMO incentives for better quality of care (F#5): "Doctors should be rewarded for practicing better medicine, and EBM is an integral part of that... I think financial incentives would make a real difference... Today there's no real reward ...nothing... zilch." Participants noted that aca- demic teaching and writing clinical guidelines necessitates continual learning and keeping up to date with the latest evidence (P#21): "I teach residents... I don't want to be caught unprepared if a resident asks me about my opinion regarding a paper that was just published."
personal strategies organizational strategies physicians need decision support	Physicians recommended both personal and organizational strategies to overcome these barriers. Personal strategies consisted of constantly keeping up-to date (via medical journals and email services), meeting regularly with a col- league experienced in information retrieval and jointly search- ing for answers to clinical questions, leaving medication databases open during consultation, and using patient hand- outs. The main organizational strategies suggested include providing decision support services, assisting in "real time" decision making and decision support systems (P#23): "It would be very helpful if there was a support service I could call to ask questions... I wouldn't feel like I'm imposing myself and taking up the specialist's time"; (F#9): "There might be information overload using a decision support system, but it's more realistic and less time consuming than looking for the information myself." Other suggested strategies included: annual EBM knowledge exams and

	quality of care monitoring, regular staff meetings in primary care clinics, and journal clubs.
teaching course enhanced own knowledge and skills intervention ineffective in patient encounters	Facilitators' Perceptions of Changes in Themselves. Most facilitators found that teaching the course enhanced their own knowledge and skills; however, opinions differed regarding the impact on behavior. Some felt that their improved information retrieval skills influenced their ability to access EBM resources at the point of care (F#9): "Clinical questions that took me hours at night became 5-minute tasks done during the encounter. It's a major difference." But others noted the intervention had little impact on their ability to utilize pre-appraised resources and believed the intervention had missed the mark (F#5): "If the aim of the intervention was that while sitting with a patient I'll be able to punch in a question and retrieve information within minutes, well we've failed. It just won't happen". Integrating EBM at the point of care was seen as more feasible through writing down clinical questions, and later, searching for them at home (F#3):"I can't do much when the patient is present, but I'm able to write down questions which I later search for at home. At our subsequent meeting, I bring printed material and show it to them. This helps."
student attitudes empowering improved computer and EBM skills little impact on behaviour	Facilitators' Perceptions of Changes in Participants. Facilitators believed the intervention affected their students' attitudes, empowered them, improved their computer and EBM skills, but doubted the impact on their behavior (F#2): "Do I fantasize that the intervention influenced my students' decision making? Unfortunately, no." Others felt behavioral changes won't be detected by examining (F#5) "test referral and drug prescription rates before and after the intervention," but rather, by examining micro-changes (F#6):" I taught them how to take text out of journal articles and paste it in their patients' charts...These facets made EBM come to life in their daily practice." A number of facilitators noted that the intervention's effect depended on the initial knowledge of trainees (F#10): "The course really made a difference to those who had studied EBM in family medicine residency... Doctors lacking the baseline knowledge had a difficult time."
	JGIM intervention changed their behavior, some admitted that changes were mostly perceptual (P#21): "After the course I was really juiced up about the whole EBM idea... I'm constantly thinking about it; I'm in the process of starting... but I haven't gotten down to it yet."

Level Two Coding, Article 004

INTERVENTION ITSELF
- ease of databases
- incentives,

INTERVENTION TOO TECHNOLOGICALLY COMPLEX
- jargon
- lack of physician's computer skills
- outdate computers
- physician's age
- time constraints
- work overload

PATIENTS DO NOT UNDERSTAND PHYSICIANS
- patients demanding redundant treatment

- patient disconnect

SYSTEM
- busy urban setting
- constant updating of evidence
- uncertainty
- changing recommendations

SOLUTIONS
- physicians need decision support
- personal strategies
- organizational strategies

INTERVENTION IS EMPOWERING
- student attitudes
- empowering

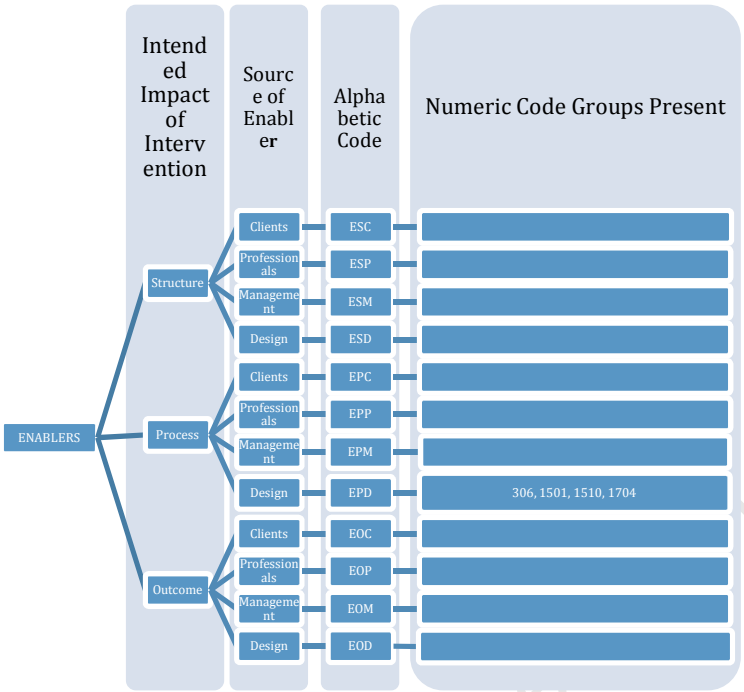
INTERVENTION ENCOURAGED CONTINUOUS LEARNING
- improved computer and EBM skills
- teaching course enhanced own knowledge and skills
- continual learning required

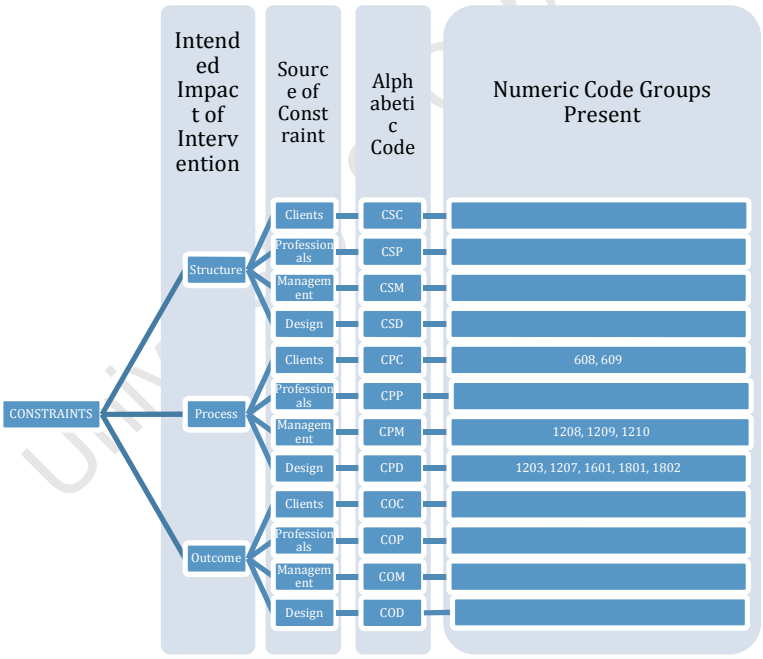
INTERVENTION UNABLE TO ALTER PATIENT BEHAVIOUR
- intervention ineffective in patient encounters
- little impact on behaviour

Level Three Coding, Article 004

ENABLERS
INTERVENTION IS EMPOWERING – 1501, 1704 INTERVENTION ITSELF – 306, 1510
CONSTRAINERS
PATIENTS DO NOT UNDERSTAND PHYSICIANS – 608, 609 SYSTEM – 1210, 1209, 1208 INTERVENTION TOO TECHNOLOGICALLY COMPLEX – 1601, 1207, 1801, 1802, 1203

Visual Account of Coding:


Intended Impact of Intervention
Source of Enabler
Alphabetic Code
Numeric Code Groups Present
ENABLERS
Structure
Process
Outcome
Clients
Professionals
Management
Design
ESC
ESP
ESM
ESD
EPC
EPP
EPM
EPD
EOC
EOP
EOM
EOD
306, 1501, 1510, 1704


Intended Impact of Intervention
Source of Constraint
Alphabetic Code
Numeric Code Groups Present
CONSTRAINTS
Structure
Process
Outcome
Clients
Professionals
Management
Design
CSC
CSP
CSM
CSD
CPC
CPP
CPM
CPD
COC
COP
COM
COD
608, 609
1208, 1209, 1210
1203, 1207, 1601, 1801, 1802

Appendix 6-005: Coding

Level One Coding, Article 005

Label	Text
intervention sites outperformed control sites	On almost every quality indicator, whether reported by staff, observed by evaluators, or reported by clients, the intervention sites performed statistically significantly better than the control sites only 15 months after these low-key interventions began.
staff actions critical	Although there were (expected) quality improvements in both countries related to the more direct contributions made by the project per se, such as improvements in infection prevention after training, there was also evidence of a whole range of other improvements that resulted from staff actions themselves. In the
improved services, improved access to services	intervention sites, we observed greater availability of services being provided in cleaner, more pleasant, more private settings.
improved experience	We also observed (confirmed by clients) more respect and information for clients, more privacy, with improved provider interpersonal communication skills, use of improved diagnostic skills, improved home care instructions, some improvement in
more satisfied clients, more educated clients	prescribing practices, and improved immunization practices. We also found more informed and more satisfied clients, and their acknowledgment that changes in services had occurred over the past year.
intervention suggests	The COPE exercises only suggest what standards of care might be; there are no specific interventions. Limited short training
staff requested training	requested by staff in information, education, and communication approaches, infection prevention, and facilitative supervision was conducted, but the changes seen in this study are much broader in scope and begin to address the underpinnings of quality services.
staff initiated improved client care	Nobody told staff that they needed to treat clients better, give out more information, ensure uninterrupted consultations, and take better histories. Working through the COPE exercises enabled
intervention encouraged reflection	those individuals willing to look critically at themselves to plan and make changes to self-identified problems. Working through the exercises as a group of staff helped foster a critical mass of
working together	enabled workers.
prompts	With an open-ended intervention like COPE, what led staff to take specific and sometimes bold actions to improve quality of services? Staff generally knows what needs to be done to provide quality services. But they sometimes forget; or they are unable to
lack tools or knowledge	do a good job because they lack the tools or the technical expertise, or they lack feedback on their performance; or they are so demoralized that they have given up trying to understand and
lack feedback	interact personally with their clients. We had hypothesized that the COPE intervention would lead to personal and organizational
lack motivation	change that providers would feel empowered, more confident and free to act, assume ownership of the problems (and the solutions), have raised morale and commitment, be more reflective, and feel better sup- ported. Findings from end-of-evaluation staff focus group discussions, reported elsewhere [12], confirmed that staff
empowering	did indeed feel that they had begun to break down some of the communication barriers and inertia running through their health services and that COPE had helped to provide the fertile ground
intervention provided foundation	upon which organizational change could occur, changes that led to improved quality of service and enhanced client satisfaction. Staff

external stimulation provoked internal change ownership support from superiors client appreciation	told us that the fact of outsiders not identifying the problems, not suggesting the answers, and not providing the solutions, but instead creating an enabling environment for staff to do those things themselves, is what stimulated action and created change. This very ownership of problems and their solutions, although daunting at first, seems to have had a strong impact on staff attitudes toward their work environment and in changing their own behaviors/interpersonal interactions with other site staff as well as with clients. This was reinforced by feelings that management, supervisors, and clients appreciated them and were relying on them to make good decisions.
poor prescribing skill and knowledge deficits resource constraints external support critical	Although COPE could effect changes on service quality in many areas, there were a few indicators where there was little or no observable difference between intervention and control sites. For example, there were generally poor prescribing practices in both intervention and control sites in both coun- tries. Although COPE can raise issues such as these, some problem areas still will require specific technical skills and knowledge to address them. There are other areas where staff are constrained in their ability to take action. The data showed that there were little observable or sustainable differences between the intervention and control sites in availability of drugs and equipment, even though many intervention sites had taken steps to work with the local health committees to make funds available from the community coffers for such purchases. The important role of external support from district management committees, supervisors, and community health councils is crucial to solve such problems and to keep facility staff engaged in their own problem resolution efforts.

Level Two Coding, Article 005

IMPLEMENTATION STAKEHOLDERS IMPORTANT
- staff actions critical
- external support critical

INTERVENTION SUCCESSFUL
- intervention sites outperformed control sites

IMPROVED PATIENT EXPERIENCE
- improved services
- improved access to services
- improved experience
- more satisfied clients,
- more educated clients

STAFF FELT SUPPORTED
- support from superiors
- client appreciation
- working together

OWNERSHIP
- ownership
- staff initiated improved client care
- intervention encouraged reflection

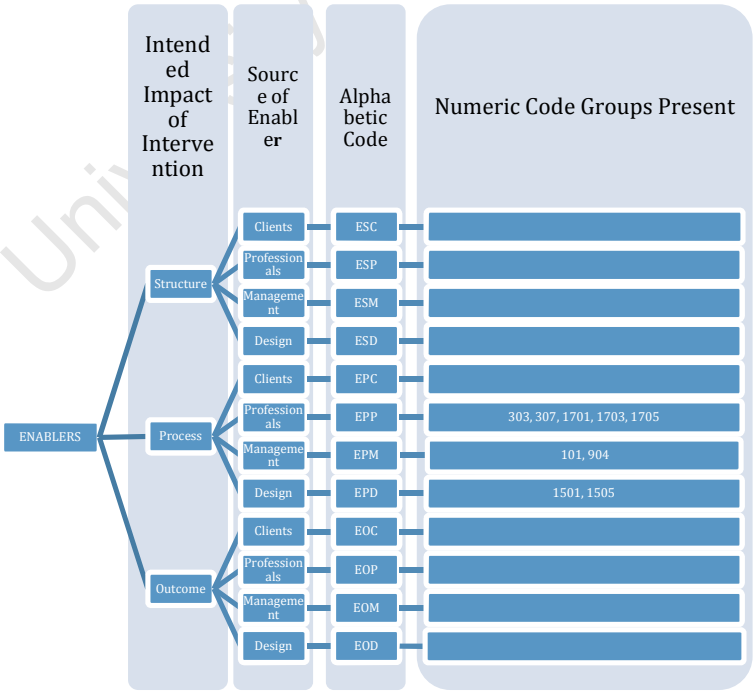
INTERVENTION ITSELF
- empowering

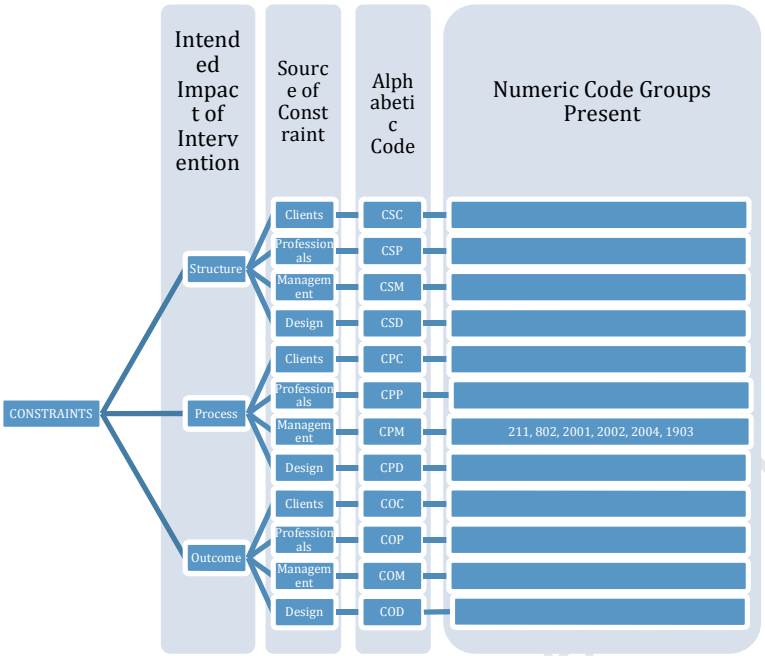
○ intervention provided foundation ○ prompts BENEFICIAL EXTERNAL COLLABORATION ○ external stimulation provoked internal change STAFF LACK GUIDANCE ○ lack feedback ○ lack motivation STAFF LACK RESOURCES ○ lack tools or knowledge ○ poor prescribing ○ skill and knowledge deficits ○ resource constraints ○ staff requested training

Level Three Coding, Article 005

ENABLERS
IMPLEMENTATION STAKEHOLDERS IMPORTANT – 307, 904 STAFF FELT SUPPORTED – 101, 303, 1705 OWNERSHIP – 1701, 1703 INTERVENTION ITSELF – 1501, 1505 BENEFICIAL EXTERNAL COLLABORATION - 903
CONSTRAINERS
STAFF LACK GUIDANCE – 211, 802, 2003 STAFF LACK RESOURCES – 2001, 2002, 2004, 1903

Visual Account of Coding:





Appendix 6-006: Coding

Level One Coding, Article 006

Label	Text
educate providers on systems, diagnosing multiple components improved outcomes, supporting providers beneficial, standardization of practice, increased teamwork, improved diagnostics	First, the intervention introduced PCPs to the essential systems components of the chronic care model, including self-management support, delivery system design, decision support, and clinical information systems. Addressing multiple components of the chronic care model likely improved our outcomes. Second, assisting PCPs in incorporating these chronic care components into their office operations resulted in decreased variation in practices among PCPs, more reliance on members of the office support staff to assist with information management (eg, sending out and scoring rating scales), and more-systematic assessment and documentation of responses to therapy.
diagnostics adopted treatment less adopted, difficult to improve medication maintenance, difficult to improve treatment maintenance, practices may prefer qualitative measurements, diagnosis requires quantitative methods, logistical issues, upkeep of recommendations,	Although this intervention model produced significant improvement in individual PCP performance, our data revealed clearly that assessment practices were more successfully adopted than treatment practices. This is illustrated by the nearly 100% use of assessment rating scales, compared with the 26% to 66% use of follow-up rating scales to track medication responses. The difficulty of improving the medication maintenance practices of PCPs has been noted in other studies. There are several possible reasons for the observed difficulty of changing treatment practices. First, PCPs may be more comfortable using a qualitative, open-ended interview process for measuring treatment responses (eg, “How has your child been doing this past month?”) than using a quantitative rating scale system. Presumably this is not the case with assessment, where there exists a clear understanding by PCPs that they need to use a set of standardized criteria to make a valid diagnosis. Another reason may involve the logistic problems associated with distributing, collecting, scoring, interpreting, and filing multiple sets of rating scales during the medication titration and maintenance phases of patient management. Continued improvement in incorporating the treatment recommendations will require a better understanding of the attitudinal and office systems barriers that interfere with the attainment of targeted treatment process goals
substantial treatment change higher than trial results, likely inflated, need a control group	Also, the magnitude of treatment change was quite substantial (effect sizes of 1.5). These response rates and effect sizes equal or exceed those observed in pharmacologic clinical trials but likely are inflated because of rater biases that emerge from open, non-blinded, administration of treatment. We have yet to test how these measures of treatment responses compare with those for children treated by PCPs using typical prescribing practices.

Level Two Coding, Article 006

INTERVENTION HARD TO MAINTAIN
- difficult to improve medication maintenance
- difficult to improve treatment maintenance
- logistical issues
- upkeep of recommendations

INTERVENTION DESIGN PROBLEMATIC
- practices may prefer qualitative measurements
- diagnosis requires quantitative methods
-

INTERVENTION PARTIALLY ADOPTED

- diagnostics adopted
- treatment less adopted

INTERVENTION STANDARDIZED PRACTICE
- standardization of practice
- improved diagnostics

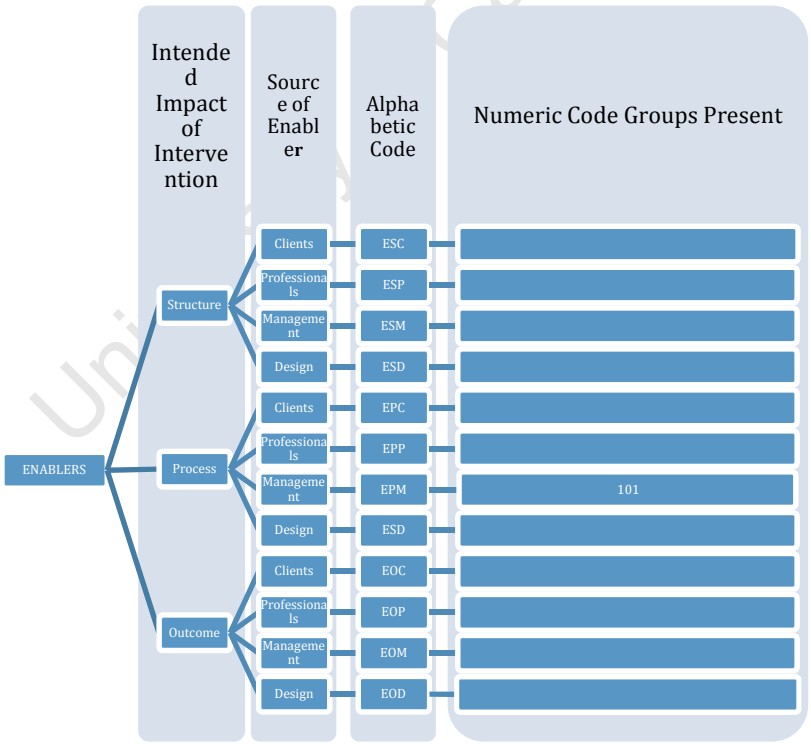
SUPPORT CRITICAL
- supporting providers beneficial
- educate providers on systems
- increased teamwork

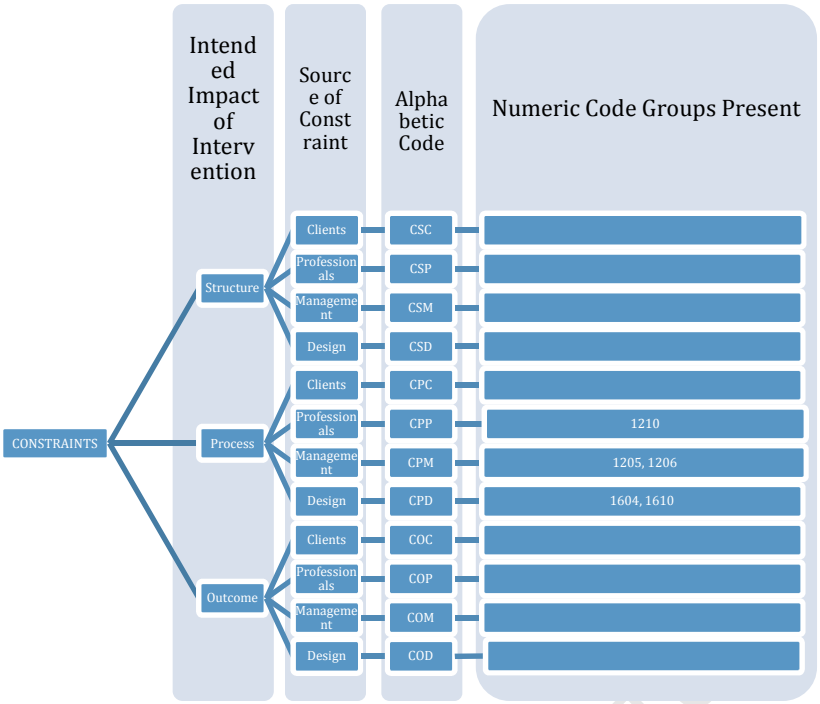
INTERVENTION SHOWED UNUSUALLY STRONG RESULTS
- diagnosing multiple components improved outcomes
- substantial treatment change (likely inflated)
- higher than trial results
- need a control group

Level Three Coding, Article 006

ENABLERS
SUPPORT CRITICAL - 101
CONSTRAINERS
INTERVENTION HARD TO MAINTAIN – 1205, 1206, 1210, 1604, INTERVENTION DESIGN PROBLEMATIC - 1610

Visual Account of Coding:





Appendix 6-007: Coding

Level One Coding, Article 007

Label	Text
adherence to complex regimes problematic proposed solutions simplification patient focused solution	The majority of the accounts (35 cases) were descriptions of cases where the nurses had reviewed the patients' needs, particularly around the use of medication, and assessed their needs for support from the local pharmacy or social services. In over half of these 35 cases, adherence to a complex regime of medication was the main problem. Typical solutions were the introduction of solutions such as simplified regimes, support and education of patients and carers, or technological support, such as NOMAD trays (drug compliance aids). One 84-year-old woman (case 33) with asthma and diabetes, severe osteoarthritis and polymyalgia rheumatica had been given two types of asthma inhalers, each with activation techniques. One device was therefore provided, which was simpler for the patient to use.
multifaceted problem patients requiring teams	In almost all cases, other factors in addition to medication review played a part in the problem assessment. The accounts describe individuals who had complex needs best addressed by co-co-ordinating a range of local, social, primary and secondary care providers. Two similar cases illustrate this type of work undertaken by the case managers:
incorrect communication increased testing	Case 22: 96-year-old male requiring anticoagulant monitoring This patient lived alone and had poor sight: his daughter lived away. He had diabetes mellitus, atrial fibrillation and hypertension and was being prescribed warfarin, as well as other medications. Although international normalised ratio (INR) tests were being done to monitor the degree of anticoagulation, advice about adjusting the warfarin dose was being posted to his home. However, as he was unable to read the advice and his control was poor, this placed him at significant risk of bleeding. The case manager arranged for the results to be telephoned to the patient and arranged more frequent blood tests at which his dosing plan and adherence was monitored more closely.
mobility issues	Case 36: 89-year-old female requiring anticoagulant monitoring This patient was blind, lived alone and had been diagnosed as having ischaemic heart disease and heart failure. She was reportedly spending over £100 per month on taxi fares to attend for blood tests as she was on warfarin. The case manager felt this was inappropriate and arranged for blood tests to be done at home by the community nursing services.
poor diabetes management	The patients described were almost invariably having difficult with mobility. Case 12 was an 89-year-old female who lived alone and was unable to get out independently. Although she had diabetes she had not received any diabetic checks for 3 years. The case manager found that she had high blood pressure. Medication was started and a NOMAD tray arranged.
lack of handover arrangements	Six cases provide graphic accounts of another set of problems – the lack of careful handover arrangements for patients discharged from hospital. Two cases are described of elderly patients put at risk because of poor discharge planning. One 71-year-old woman (case 16) with depression was severely distressed and had no arrangements for review. An 83-year-old man (case 63), having been admitted with acute confusion, caused by an exacerbation of COPD, had taken his own discharge. However, partly due to the

no arrangements made for followup no rehab arrangements	speed of discharge, no arrangements had been made for followup, and urgent arrangements were required to ensure his safety at home. Similarly, there were two examples of patients discharged after recent stokes with no rehabilitation arrangements. One patient, aged 77 (case 66), was discharged with swallowing difficulties. A patient aged 85 (case 19), who had speech loss, was described as becoming 'frustrated' after spending a few days at home, to the point of becoming 'unmanageable'. In these situations, case manager support was reported to have avoided re-admission to hospital.
liaised other services formal referrals increased turnaround advocacy	In almost all accounts, the case manager liaised with other services to call upon extra services. Some accounts specifically describe formal referrals to other services. For example, one 83-year-old man with increasing mobility problems due to Parkinson's disease was referred to a residential rehabilitation unit (case 51), another to Cruise for grief counselling (case 3), and another to the Expert Patients Programme (case 2). An 80-year-old patient (case 54), who was suspected of having myasthenia gravis, had been waiting for many months for a diagnostic procedure. The procedure was expedited within 2 weeks. Another 80year-old patient (case 55), having waited for many months for a neurological opinion, was rapidly prioritised. While these examples did not result in avoided admissions, they illustrate the advocacy role assumed by the case mangers.
increase in diagnoses and coordinated services serious errors averted incorrect prescriptions	There were 29 accounts recorded where new diagnoses were described and where additional care services were arranged or co-ordinated. The majority of these cases related to either cardiovascular (9 cases) or respiratory system problems (7 cases). In these cases, changes to medication regimes are described – such as increased doses of diuretics, increases in angiotensin converting enzyme inhibitors, or more instruction in the use of inhalers and nebulisers. Among the nine cardiovascular cases were three patients where digoxin toxicity was considered and confirmed. The case managers also noted instances where potentially serious errors were observed and consequences averted. One patient was noted to have been incorrectly prescribed two forms of beta-blockers and another found to have a very low level of haemoglobin while concurrently prescribed non-steroidal anti-inflammatory drugs and aspirin. Yet another patient with tremors and a tachycardia was noted to be taking inappropriately high dosages of a combined short-acting inhaler (Combivent).
infections identified hospital admission avoided	There were three accounts where urinary tract infections were identified and treatment organised. All were elderly women with numerous co-morbidities, two of them lived alone. Case 26 (see below) indicates how the case manager avoided an acute hospital admission by working with a social worker to organise a respite care bed and a care package in time for her return home.
	Case 26: 93-year-old female with urinary tract infection This patient lived with her son, who was in full-time employment. She had developed confusion: for two days before assessment she had not been eating or drinking as normal. A diagnosis of urinary tract infection was made and the problem treated. In addition, to avoid acute hospital admission, extra social services

	support was organised until a respite care bed was found in the community.
power issues impact equipment and increase hospital admissions	Case 11 provides a noteworthy account of a crisis averted: a 75-year-old female, living alone, had multiple urgent unplanned admissions due to an electrical problem at home. She panicked when her nebuliser had no power supply. The case manager intervened by organising an electrician to fix her electrical problem and as back-up, arranged a battery-powered nebuliser. No further unplanned admissions were recorded.
avoided admission to acute beds	Among the 73 accounts, six described admissions to non-acute beds: three, aged 75, 81 and 82 years, were described as having heart problems. Two 75-year-old patients were described as having exacerbations of chronic obstructive airways disease: one was admitted to a community 'winter bed' and the other to a 'nursing home'. Case 26 (see above) was a 93-year-old who developed a urinary tract infection and was found a respite bed.
facilitated terminal care at home.	Three cases are described where the case manager facilitated terminal care at home. An 82-year-old woman in end-stage respiratory failure wanted to stay at home in the company of her husband and family (case 1); a 68-year-old woman with lung cancer (case 24) was supported to explore her, and her husband's, preferences, before eventually accepting the help of a community-based palliative care team. A 77-yearold man with prostate cancer deteriorated rapidly and required the support of the case manager to coordinate an overnight carer rota that included district nurses and home carers from both local services and Marie Curie.

Level Two Coding, Article 007

INTERVENTION ENCOURAGE PROBLEM SOLVING
- proposed solutions
- simplification
- patient focused solution
- increased testing

BARRIERS TO IMPLEMENTATION
- multifaceted problems

PATIENT BEHAVIOUR PROBLEMATIC
- incorrect prescriptions
- mobility issues

POWER ISSUES INCREASED ADMISSIONS
- power issues impact equipment and increase hospital admissions

DISEASE MANAGEMENT PROBLEMATIC
- adherence to complex regimes problematic
- patients requiring teams
- poor diabetes management

STAFF COMMUNICATION BREAKDOWN
- incorrect communication

LACK OF EXTERNAL COLLABORATION
- lack of handover arrangements
- no arrangements made for follow-up
- no rehab arrangements

INCREASED CARE AT HOME; REDUCED HOSPITAL ADMISSIONS
- infections identified

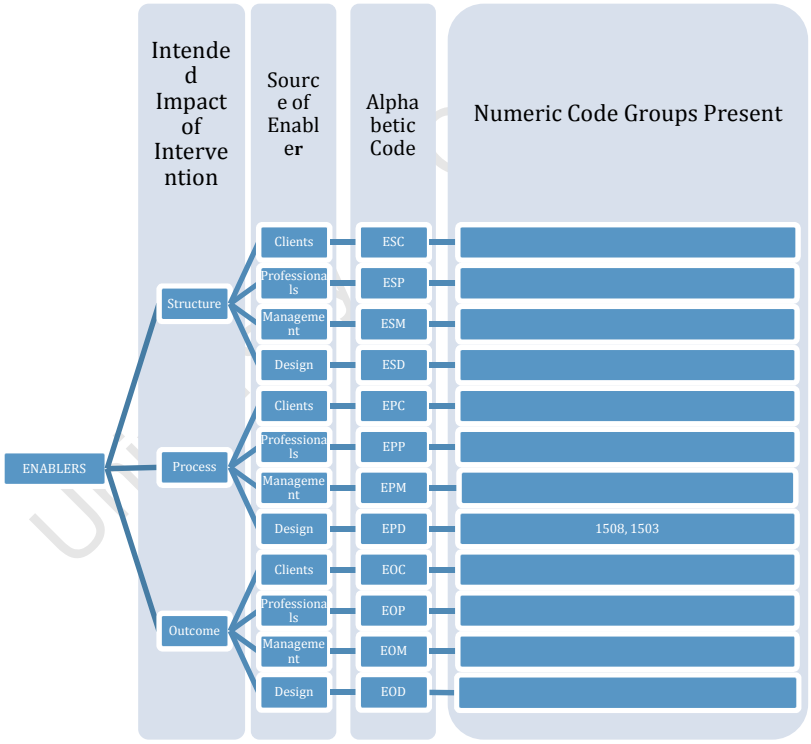
- hospital admission avoided
- avoided admission to acute beds
- facilitated terminal care at home
- serious errors averted

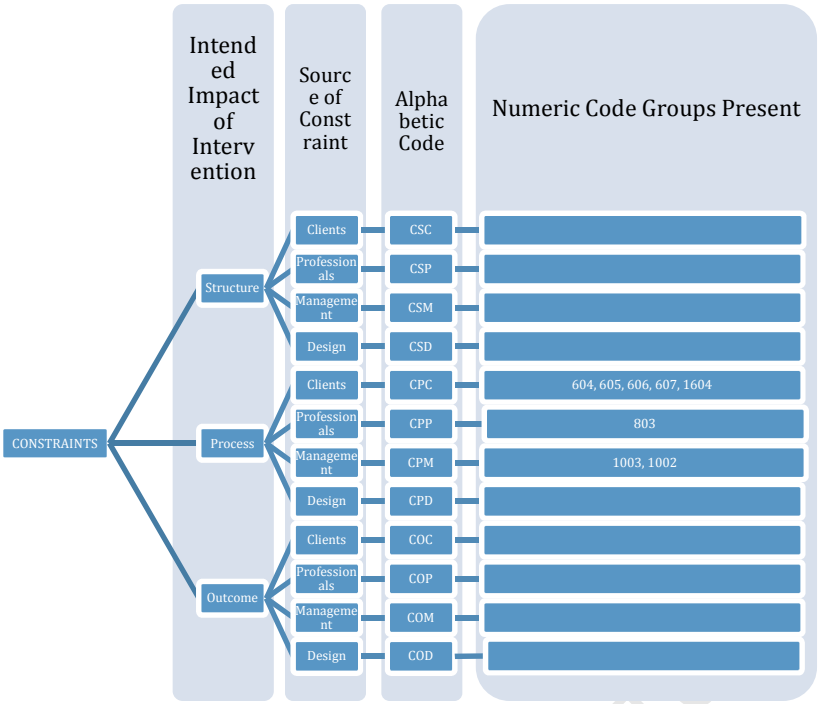
EXTERNAL COLLABORATION BENEFICIAL
- liaised other services
- formal referrals
- increased turnaround
- advocacy
- increase in diagnoses and coordinated services

Level Three Coding, Article 007

ENABLERS
INTERVENTION ENCOURAGE PROBLEM SOLVING – 1508, 1503
CONSTRAINERS
PATIENT BEHAVIOUR PROBLEMATIC – 605, 604 DISEASE MANAGEMENT PROBLEMATIC – 606, 607, 1604 STAFF COMMUNICATION BREAKDOWN - 803 LACK OF EXTERNAL COLLABORATION – 1003, 1002

Visual Account of Coding:





Appendix 6-008: Coding

Level One Coding, Article 008

Label	Text
create guidelines translate into context implementation fidelity critical contextualizing lack guidance context needs diabetes focus foundation	Once the decision was made to begin SMAs, it was necessary to create general guidelines about SMAs and translate those into the local context, with its resources and needs. Implementation fidelity is often presented as critical to achieving the levels of efficacy demonstrated in clinical trials. However, it became apparent that descriptions of SMA interventions provided insufficient detail to guide implementation into differing clinical settings. While decisions and potential options were sometimes discussed, guidance on translating and mapping out to the local context was not provided. Table 2 outlines the initial dimensions of the SMA innovation we identified (first column). The second column delineates our initial decisions or translation of the intervention to the needs of the local context. In order to maximize success and meet demanding clinical care needs, we began with diabetes as a focus because of the existing core team and its openness to change, some collaboration between key disciplines was loosely in place, the volume of patients with diabetes, the cost to the organization, and the high demand of resources required to manage patients with diabetes. However, as is true with most decisions, there were aspects of many decisions that included promoting factors but also came with hindering factors. Therefore, Table 2also outlines the promoting and hindering factors associated with each of the initial decisions.
collaboration novelty flexibility mandate for action burning platform ability to pilot test innovation multidisciplinary team members openness quality improvement team support from superiors	It is worth highlighting key promoting factors for the innovation that relate to the system levels because ultimate system redesign requires successful alignment and interplay between all levels. While the organizational structure is very hierarchical (Figure 1), there was openness to novelty. In fact, there was the supramacrosystem level mandate to begin SMAs, with considerable latitude given to how those mandates were achieved. Descriptions of the transformation of the VHA describe these seemingly contradictory strains [42]. Thus, at the supramacrosystem level, promoting factors included the mandate for action to address performance deficiencies, the so-called 'burning platform' and the simultaneous freedom and flexibility to pilot test to secure buy-in[43]. At the macrosystem level, there was similar support for innovation. At the mesosystem level, a strong core care team was essential that reflected multi-disciplinary members from the various services that would be linked. This team was open to new care models and expanding roles with a leader who had the ability to make changes at the microsystem level. Although Table2 identifies a number of promoting factors, we believe that the most essential factors were the formation of a core team committed to quality and improvement, and the leadership provided by the clinic director that was supported strongly by the team members. At the same time, there were several key innovation-hindering factors associated with

barrier constrained resources ability to alter relationships disconnected groups inability to document work flexibility absence of guidelines construction displaced staff concerns about relationships need for monitoring and evaluation	the general mandate to conduct SMAs and the specific decision to translate the mandated innovation into the local context: limited resources (such as space); potential to alter longstanding patient-provider relationships; organizational silos (disconnected groups) with core team members reporting to different supervisors; difficulties in documenting workload for credit; and finally, the flexibility itself and absence of specific guidelines for meeting the mandates, resulting in a certain inefficiency and delay in the process. Implementation in a space-constrained facility that was in the midst of major construction and renovation meant that the choice of a location resulted in displaced providers who used the space, and limited access to computers available in the conference room. There was concern that group visits with different providers would disrupt established provider-patient relationships and inhibit those providers from referring patients. The different lines of authority for each of the core team members necessitated negotiations with four different supervisors, some of whom were more open to SMAs than others. In this organization, there is a strongly perceived need (varying among different clinical and administrative departments) for meticulous accounting of one's workload. It was not intuitively obvious how to account for SMA work within current accounting systems.
SMAs dispruptive implementers and champions critical the more complex implementers sustain ownership interdisciplinary authority experience committed team key stakeholders as staff	SMAs require complex changes that impact on care routines, collaborations, and various levels of the organization. As such, implementing the initial decisions involved more than putting decisions into place. As noted by others, implementers and champions of innovation are critical. This is particularly true the more complex the change and the need for system redesign. Those who conduct and carry out the implementation obviously play a key role in helping to initiate and sustain the intervention. Implementers for our SMA intervention included a physician who was the Medical Director of the clinic and an Endocrine Nurse Practitioner. The physician was an established leader of the Primary Care Clinic for two years prior to initiating the intervention and had some training in Quality Improvement. The physician felt ownership of the improvement processes overall and had the authority to solicit and get approval for staff in other disciplines to participate in the SMA. The Endocrine Nurse Practitioner was not a member of the Primary Care Clinic but was considered to be a content expert and opinion leader at our institution. She had worked with high-risk patients with diabetes for 20 years prior to the intervention and was willing to share her expertise with patients as well as other less knowledgeable team members. All members of the core team were strongly committed to working together and were key stakeholders

	at the mesosystem level.
further analysis needed reference Grol utility compatibility involvement collective action compatible with institution high team involvement collective decision making low compatibility with traditional visits difficult to explain primary care providers have no input	Although the initial analysis and translation of the innovation (Table 2) provided a starting point and the implementers provided additional local motivation, further analysis of the SMA beyond the promoting and hindering factors associated with the decision to implement was necessary for guidance to tailor and adjust the innovation to the local context. Grol *et al*. identified a series of characteristics of innovations that might promote or hinder implementation processes [32]. The relationship between these factors and the local context is outlined in Table 3. While the relative advantage/utility was appreciated by the initiators early on, three other innovation characteristics also appeared to be critical to successful implementation: compatibility, involvement, and collective action. This innovation was very compatible with the norms and values of the institution in promoting improvement in chronic disease quality measures. The involvement of the core team who would be implementing the SMA was very high. Individuals met to collectively decide the specific details of the clinical experience for patients and providers. However, hindering factors included: low compatibility with the traditional one-on-one visit with a primary care provider, high complexity in that the innovation was difficult to explain, and low collective action from the primary care providers who did not have input into the SMAs into which their patients would be recruited.
intervention tailoring system redesign fraught with issues identify and categorize problem changes to SMA process system changes flexibility helps and hurts strong team	The initial decisions and implementation endeavors began the process of practice change, but iterations of tailoring the intervention and negotiating system redesign were necessary. While not surprising that there would be issues on the path from start-up to sustainability, little attention has been given to identifying and categorizing them. Within our local context, the SMA process for patients with diabetes has changed over the last two years. These changes have occurred at the level of the clinical microsystem, mesosystem, and macrosystem. Within the microsystem, many changes have involved team structure, the patient population, and clinic flow. In Table 3, we have used the Grol *et al*. framework to list the key changes over time and strategies for promoting implementation and sustainability [32]. This framework identifies the flexibility and adaptability during implementation as a dimension which can either promote or hinder the process. We found that because our SMA had a strong core team, this was an important aspect to identify and maximize throughout implementation. Once identified, we could use this promoting factor to offset challenges encountered during implementation. The lack of clear designation of

offset implementation challenges vague description enabled adaptability emerged nutrition needs documentation solutions individual focused solution complexity of intervention vague clinical care pilot testing identification and mitigation	what the innovation and team members needed permitted the team to adapt the innovation to the local context and needs throughout the implementation process. As an example, we recognized after initiation of the SMA process that patients wanted to discuss dietary issues in detail, and we subsequently added a nutritionist. Another example is the response to the challenges of documenting the patient visit. We initially used the group note function in our electronic medical record. The group note field allows text to be entered that will appear in the note of every patient in the group. However, it was recognized early on that such a note did not allow for customization. Therefore, we initiated the development of a template note with embedded guidelines that was user-friendly and facilitated the efficiency of documentation and standardization and completeness of individual treatment plans. This development took place over a period of several months. Another characteristic is that of complexity of both the innovation (SMA) and its implementation. The SMA was something that was identified initially as a vague unknown type of clinical care which was not easy to explain to the primary care staff. This constituted a barrier to successful implementation. We decided to take advantage of a trial period with small numbers of patients to highlight success as well as allow clinic practitioners to sit in on one to three SMAs. Through identification of this barrier we were able to develop a strategy to overcome it.
continuous tailoring continuous context adjustment referrals possible conceptual issues expand and integrate services	The right side of Figure 1 depicts the conceptual model that evolved with the successful implementation of SMAs for patients with diabetes. The system redesign that resulted from implementing SMAs included continuous tailoring of the intervention to and continuous adjustment of the local context. This interplay of co-evolving components added a new clinical venue to which referral of patients was possible. SMAs were designed with the idea that they would exhibit the characteristics of a high-performing clinical microsystem; *e.g.*, alignment of roles and training for efficiency and staff satisfaction; interdependence of the care team to meet patient needs; integration of information and technology into work flows; and supportiveness of the larger organization [36,44]. However, we felt that to conceptualize SMAs as another clinical microsystem was confusing, given the co-presence of the more traditional microsystem and the unique way SMAs expanded and integrated other services and resources of the primary care clinics that was contrary to traditional thinking about care. Moreover, the primary responsibility for the patients seen in the SMAs was and would remain in the hands of the primary care provider in his or her microsystem. Accordingly, SMAs are identified as an intra-mesosystem component to recognize the linkages among and

patient responsibility	between other meso components (intra-meso) beyond the microsystem, and to emphasize the system redesign. Additionally, the SMA with its own iterative improvements and evolution seemed a separate system as opposed to a higher functioning system that already existed. This is in contrast to the initial system design where there was only the closed microsystem with the components within (intra-micro) the inner clinical microsystem.
recognition of expertise overlapping care potential undermining impact	System redesign is also reflected in the arrangement of the SMAs: the squares in Figure 1represent participants on equal footing by recognizing the role of each discipline's expertise, including the patients who also bring expertise to the exchange. In addition, the graphic representation of the flow of communication underscores the mutual contributions and simultaneous, non-sequential nature of the interactions for patients and providers. Finally, the clinical microsystem and the intra-mesosystem (SMAs) are overlapping to reflect that SMAs do not eliminate the traditional clinical microsystem but rather offer another opportunity for care, with both approaches co-evolving. This point is particularly important to recognize, as one concern providers often expressed was the potential undermining impact SMAs might have on the individual provider-patient relationship.
	The current local context and care-based practices related to diabetes are summarized in Figure2. Changes or differences are denoted in italics, with items directly impacting on diabetes care aligned on the right side of the last column. The current state of the SMAs for patients with diabetes is summarized in the pull-out box that reflects the intra-mesosystem redesign level. Figures 1 and 2 help to identify the major changes and shifts in local context as well as the issues related to tailoring the intervention and adjusting the context.
system level issues windows of opportunity changing priorities lack of success	It is worth highlighting some issues at each level of the care system. At the supramacro level, while continued improvement in information technology helps further support the SMA as configured at the local level, the mandates and priorities have changed. While this is to be expected, it does alert innovators and implementers to appreciating windows of opportunity. If the innovation has not taken off and achieved a force of its own (including demonstrating some levels or areas of success consistent with the organizational goals), changing priorities (new mandates), and the lack of success will create increasingly difficult challenges.
expand intervention	Given the demonstrated successes, leaders at the macrosystem system want the SMAs to be expanded to other conditions and possibly other care sites, *e.g.*, the community-based outpatient

enacted change	clinics linked to the main facility. Some new or adjusted practices beyond the actual SMA venue at the mesosystem level have also come about because of SMAs (*e.g.*, monthly clinic meetings to discuss resource allocation and group meetings among discipline representatives) and some will help to further propel SMAs forward (*e.g.*, registry and protocol development to identify high-risk patients).
performance pressure overburdened resources unintended consequences sustainability desired	At the microsystem level, primary care providers are experiencing more pressure to meet performance measures of quality and productivity (and at the supramacrosystem level, the current context is also for more prescriptive approaches about how to achieve goals). The objectives of the diabetes SMA map out to the increased pressures experienced by providers. Seeing the successes of the SMA, providers began to send patients with A1c levels very close to goal. This was not necessarily all positive, as we were unable to accommodate those identified in the registry with an A1c of greater than 9%. While the magnitude of the increase in referrals to SMAs created some unanticipated adjustments, we have worked and continue to work and negotiate with providers to prioritize resources. Their clear desire to refer more patients to SMAs underscores the growing foundation for sustainability.
intervention valued increased referrals teamwork important unofficial overtime teamwork staff pitch in weekly meetings open forum for discussion shared ownership	Many factors contribute to implementation and sustainability of the SMA within the mesosystem (intra-mesosystem component) and with regard to its relationship to the clinical microsystems. Most importantly is how the SMA is valued. The increased number of referrals is evidence of the value placed on SMAs by the mesosytem providers. SMAs are valued by the professionals on the team based on their experiences with patients and on their feelings of a high degree of 'teamness', or esprit de corps [45]. Team members meet after each SMA where various members take turns working a little extra to support the SMA during non-clinical time with activities like making extra phone calls, generating letters to new patients, tracking patient satisfaction data, and meeting to change flow, if needed. In addition, the flexibility of the individual team members is manifest during the SMA sessions; all staff members pitch in with clerical duties as needed, re-check blood pressures, and download glucometers. A weekly meeting after each SMA continues to occur to discuss patients and processes to assure that all team members have an open forum to voice concerns and make group changes, thus maintaining the high degree of shared governance. In addition, beyond improved clinical outcomes, patient satisfaction has helped confirm the added value to providers and to administration (macro- and supramacrosystems). Patient

patient satisfaction patient education patient care	satisfaction surveys routinely are administered following the SMA. Typical comments from patients have included: 'I learned a lot', 'this clinic really takes such good care of patients' and 'I wish this kind of clinic existed 20 years ago.

Level Two Coding, Article 008

IMPLEMENTATION TINKERING ESSENTIAL
- implementation fidelity critical
- contextualizing
- windows of opportunity
- intervention tailoring
- pilot testing
- identification and mitigation
- windows of opportunity

DEDICATED STAFF
- unofficial overtime
- staff pitch in
- weekly meetings

TEAMWORK BENEFICIAL
- shared ownership
- teamwork important
- teamwork
- multidisciplinary team members
- quality improvement team
- committed team
- strong team
- collective decision making

EXTERNAL COLLABORATION IMPORTANT
- referrals possible

ABILITY TO TINKER INTERVENTION
- flexibility
- burning platform
- ability to pilot test
- Vague description enabled adaptability
- continuous tailoring
- continuous context adjustment
- mandate for action
- create guidelines
- translate into context

INNOVATIVE INTERVENTION
- innovation
- utility
- novelty

INTERVENTION COMPATIBILITY
- compatibility
- low compatibility with traditional visits
- overlapping care

INTERVENTION SUPPORTED BY INVOLVEMENT
- foundation
- involvement
- collective action
- compatible with institution

- high team involvement

SUPPORTED BY MANAGEMENT
- interdisciplinary authority
- experience openness
- support from superiors
- implementers and champions critical the more complex
- implementers sustain
- ownership

EMPOWERED STAFF
- key stakeholders as staff
- offset implementation challenges
- recognition of expertise
- patient responsibility

INTERVENTION CHANGES ENVIRONMENT/SYSTEM
- system redesign
- fraught with issues
- identify and categorize problem
- system changes
- flexibility helps and hurts

INTERVENTION AIDS PROBLEM SOLVING
- changes to SMA process
- documentation solutions
- individual focused solution
- conceptual issues
- system level issues

INTERVENTION IS COMPLEX
- complexity of intervention
- vague clinical care
- potential undermining impact
- flexibility

INTERVENTION CAN BE DISRUPTIVE
- SMAs disruptive
- ability to alter relationships
- lack of success

IMPLEMENTATION LACKS GUIDANCE
- lack guidance
- absence of guidelines
- difficult to explain
-

INTERVENTION NEEDS TO BE MORE DISEASE FOCUSES
- context needs diabetes focus

PROVIDERS ARE NOT INVOLVED
- primary care providers have no input
- changing priorities

REQUIRE MORE RESOURCES
- constrained resources
- overburdened resources
- inability to document work
- need for monitoring and evaluation

STAFF BECOME DISCONNECTED

- disconnected groups
- construction displaced staff
- concerns about relationships
- performance pressure

RESULT: EXTERNAL COLLABORATION
- increased referrals
- collaboration

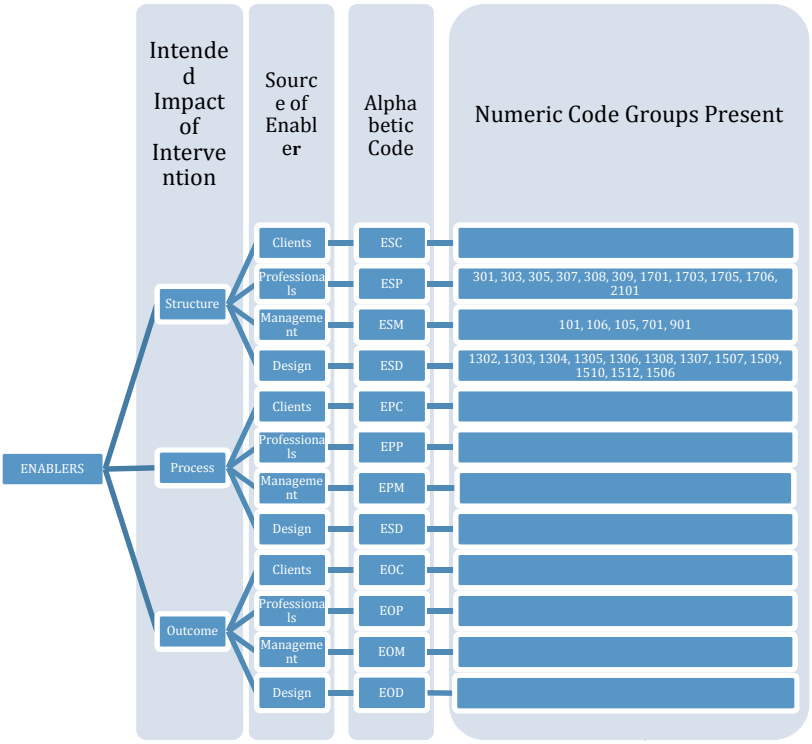
RESULT: IMPROVED PATIENT EXPERIENCE
- patient satisfaction
- patient education
- patient care

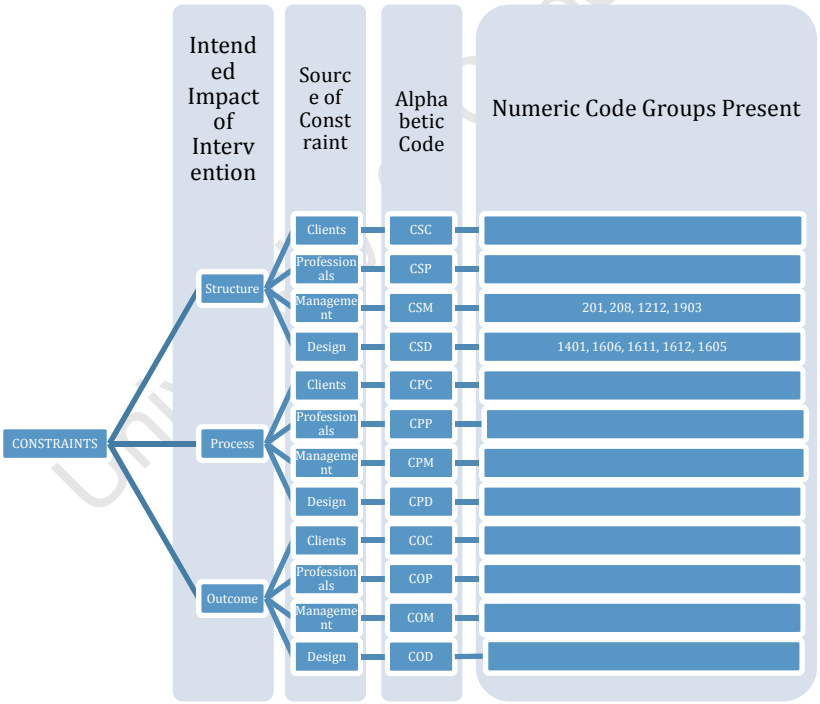
RESULT: WIDER INTERVENTION ADOPTION DESIRED
- intervention valued
- sustainability desired
- expand and integrate services
- expand intervention
- enacted change

RESULT: ADDITIONAL PATIENT NEEDS
- emerged nutrition needs

Level Three Coding, Article 008

ENABLERS
IMPLEMENTATION TINKERING ESSENTIAL - 1304, 1303, 1302, 1308, 1306, DEDICATED STAFF – 1703, 307, 2101 INTERVENTION SUPPORTED BY INVOLVEMENT/TEAMWORK BENEFICIAL – 1701, 303, 301, 305, 309, EXTERNAL COLLABORATION IMPORTANT - 901 ABILITY TO TINKER INTERVENTION – 1510, 1305, 1306, 1308, 1303, 1307,1507, 1512 INNOVATIVE INTERVENTION – 1509 INTERVENTION COMPATIBILITY - 1506 SUPPORTED BY MANAGEMENT – 101, 106, 105, 701 EMPOWERED STAFF – 308, 1706, 1705
CONSTRAINERS
INTERVENTION IS COMPLEX - 1605, 1606 INTERVENTION CAN BE DISRUPTIVE – 1606, 1611, IMPLEMENTATION LACKS GUIDANCE – 1401 INTERVENTION NEEDS TO BE MORE DISEASE FOCUSES - 1612 PROVIDERS ARE NOT INVOLVED – 208, 1212 REQUIRE MORE RESOURCES – 1903, 201


Intended Impact of Intervention
Source of Enabler
Alphabetic Code
Numeric Code Groups Present
ENABLERS
Structure
Process
Outcome
Clients
Professionals
Management
Design
ESC
ESP
ESM
ESD
EPC
EPP
EPM
ESD
EOC
EOP
EOM
EOD
301, 303, 305, 307, 308, 309, 1701, 1703, 1705, 1706, 2101
101, 106, 105, 701, 901
1302, 1303, 1304, 1305, 1306, 1308, 1307, 1507, 1509, 1510, 1512, 1506


Intended Impact of Intervention
Source of Constraint
Alphabetic Code
Numeric Code Groups Present
CONSTRAINTS
Structure
Process
Outcome
Clients
Professionals
Management
Design
CSC
CSP
CSM
CSD
CPC
CPP
CPM
CPD
COC
COP
COM
COD
201, 208, 1212, 1903
1401, 1606, 1611, 1612, 1605

Appendix 6-009: Coding

Level One Coding, Article 009

Label	Text
identified categories	Four main categories were identified from the data: • Implementing case management – supporting factors and barriers on a practice level; • Implementing case management – positive and negative experiences with patients; • Disease-specific benefit; • Role perception and relationship to patients and GP.
case management supporting factors organizational issue solutions	Implementing case management The implementing case management category describes factors, which facilitate or inhibit the effective implementation of case management in general practice. The supporting factors and barriers: the organization and practice team Supporting factors and barriers: the organization and practice team relate to each member of the team (doctors' assistants, general practitioner and other non-healthcare professionals) and to organizational practice issues. They demonstrate the wide range of practice-specific solutions for the successful implementation of case management.
motivation and involvement influence attitude discussion positive nominations negative coercion negative attitude change	Reasons to participate: Doctors' assistants' attitudes towards their new role as a case manager were influenced by their reason for participating and prior involvement in the HICMan trial. Participants who discussed their participation with their employing GP and were asked to participate in case management started with a positive attitude. In contrast, a barrier was created for those who were nominated by their GP for participation in the project: Yes, with us it was the same. We'd already taken part in the ''Train the Trainer'' trial and initially I didn't want to continue to take part... Well, I was quite negative towards the whole thing because I was pushed into it, but now...with the feelings I have now, I would have probably agreed to take part. (FG 1 DA19) This quote shows an initially negative attitude towards case management by this participant, which changed during the course of the intervention.
time importance effective time scheduling	Time to accomplish case management Because the tasks associated with case management were new to doctors' assistants, the time taken and available to accomplish them was important in its implementation. The majority of participants perceived that the satisfactory routine implementation of case management needed to be accomplished during normal working hours: Well, I did the home visit directly from my (home). Normally I have to be at work at 4 pm, and in that case I was at the patient's home by 4 pm....That's a must. (FG 4 DA 27) I have the lucky opportunity that I'm at work Tuesday afternoon for 2 hours where there's no practice routine...that's when I do my phone calls. (FG 4 DA25)
staffing issues unofficial overtime	In contrast, some doctors' assistants could not accomplish some tasks, such as home visits, during normal working hours or could only do so if they transferred other tasks to colleagues: Because there are only the two of us and I am responsible for the phone calls for the whole day and I then I just can't say, 'I'll be off now.' (FG 2 DA5) I practically do it during my time off. I work part-time 20 to 24 hours a week, always in the afternoon – and the first home visit was on a Monday... The day started at 8am and went until 10Æ30

	or Æ45. That's how long I was busy then. (FG 4 DA24)
support support from leadership increased understanding	Team members The support of all team members, but especially the GP, was regarded as crucial. This support helped doctors' assistants understand their new roles as a case manager, for example by discussing the telephone monitoring sessions or home visits with the GP afterwards. It also ensured that any changes subsequently initiated by the GP were understood by the doctors' assistants: He (the GP) involves me also afterwards regarding the changes or consequences. For example, when he adds a new medication. He considers it as very important and also appreciates that I do it (the case management). (FG DA13)
team support staffing solutions increased communication	Overall, for the effective implementation of case management, it was important that doctors' assistants received support from the whole practice team: Well, we've organised that a little in the practice. So now on days when I do it (case management) we are always one colleague extra. On those days I'll make the phone calls or the home visits and after visiting hours we'll talk about it all. (FG 2 DA1)
feedback valued shared responsibility	Most participants reported that feedback received from GPs about their case management reports was valued and showed the shared nature of the management process: He [the GP] then includes me afterwards, regarding the changes or consequences of it [the monitoring]. Or if he adds some new medications. (FG 3 DA13)
no support, underappreciated double burden	If doctors' assistants did not receive this support, implementing case management within normal daily routine was jeopardised: Well, I do think it's a pity because we all do put in a lot of effort and do it with dedication and with whole heart, and I just think it's a pity and that annoys me to a certain degree, because I've put in effort and the patient was willing to take an hour for the home visit and then it's just dealt with on the side. No, it's worth more than just a bit of bla, bla,... (FG 2 DA4) Well, I experienced something like a double burden. Because I had to arrange my boss's things. And then had to make sure that everything was right. (FG 3 DA8)
	Positive and negative experiences with patients Positive and negative experiences with patients' factors relate to experiences with patients while implementing case management, which either enhanced or inhibited implementation of the case management approach by doctors' assistants.
mostly positive time and attention appreciated satisfaction being heard collaboration	Positive experiences with patients. All participants described a wide range of positive situations that they experienced with patients, particularly being able to give them more time and attention while implementing case management. According to participants, this also satisfied the needs or wishes of patients: It's very interesting, when the people start talking. According to the motto, 'Now somebody's got time for me.' You feel that it really appeals to the patients. They can now talk quite a bit more than usual when they visit the practice. (FG 1 DA20) This enhanced role and working together with patients was seen by most doctors' assistants as a positive shared effect of case management.
the need to prove	Many also want to show what they do. One of my patients showed me his brand new fitness bike in order to show me his activities, and said that he uses it in the morning in front of the TV... They really enjoy that. (FG 2 PA1)
minority negative	Negative experiences with patients. A minority of negative experiences were perceived by some doctors' assistants, such as poor motivation by patients resulting in suboptimal cooperation

poor patient motivation	and a negative attitude towards case management:
collaboration unappreciated	But all in all it was the only unmotivated patient, who always says, ‘‘I don’t really care what happens afterwards’’. And when I get there and see that things have become worse or are different than usual, then I’ll ask afterwards... But that’s part of the few things that I would actually prefer to forget. Because he doesn’t appreciate the collaboration. (FG 3 PA8)
elderly care issues disconnect perception problems assumptions	A large number of problems arose during performance of the elder care basic assessment, particularly while performing the dementia test, because doctors’ assistants perceived patients to be embarrassed: I also experienced that they had problems with the DemTect [a screening test for dementia] because of the writing, the thing with the numbers. And that they therefore felt quite embarrassed. Maybe that we would assume that they could not spell correctly, that they were too dumb (FG 1 DA16)
insecure unclear protocol emotional involvement	Reflecting on experiences with patients A minority of doctors’ assistants described situations where they felt insecure in new or unforeseen situations with patients and that it was unclear where such events fitted in the case management protocol; for example, encountering more emotional involvement: For example, in the column physical activities there was one patient who said, that his cardiologist said that he’s not allowed to do anything any more. He should only look at the roses, not even cut them... Should I put down that he shouldn’t do anything any more or ... then I started considering what I should record. (FG 4 DA24)
    self doubt best practice	The following quote shows how a doctors’ assistant described one such situation: Well, I had one incident in between. When I called the first time everything was okay and 10 days later the patient had a little stroke and that hits you really hard – ‘‘Did you do anything wrong? Did you miss out on anything?’’. ...You just don’t know that then. (FG 4 DA26)
emergence of new strategies routine	Subsequently, some doctors’ assistants used these new experiences to develop new routines and strategies to cope with these situations: Once the first phone call and the home visit are done, you just get the hang of it, and then it actually works quite well. (FG 2 DA1)
  disease specific	Disease-specific benefits The disease-specific category describes situations in which doctors’ assistants considered that case management was beneficial for patients with regard to disease-related issues and patient outcomes.
   participants satisfied disease specific management successful physical activity motivation	Perceived improved patient self-management and identification of patient problems Most participants thought that case management was effective in improving disease-specific self-management for patients with CHF. They emphasized the importance of physical activity while counselling patients and perceived that these actions led to increased physical activity by many patients: He even wanted to attend the coronary heart sports group with his neighbour because the neighbour was been doing that for years, and he asked us if he could do this also. (FG 2 DA5) And my old granddad, he wants to add an extra half an hour now, so he gets some more exercise, because up until know he’s only taken his walking frame to go down town and back, and now he’ll walk around an extra block. (FG 2 DA5)
medical understanding	Moreover, all doctors’ assistants thought that most patients developed a better understanding of their disease and self-

observation personal improvement	awareness about its course as a result of case management: But in the meantime he observes himself better. And he reacts better. He also has diabetes and has changed himself completely. (FG 4 DA 24)
improve detection personal habits lack of initiative	All doctors' assistants acknowledged that the case management approach had helped the practice team to detect and address relevant disease-related patient problems: Especially concerning the patients' drinking habits. My boss never knew that all three patients were drinking wrongly. One drinks far too much, about 4 litres a day ... Well, that was only revealed by the first phone call. (FG 3 DA13) Well, I can only remember that one time, where I phoned him and he complained about being short of breath that day. I didn't know if he would have called, I just don't know... Well, I think, if he wouldn't have come forward and would just have waited, then maybe he would have ended up being taken to the hospital by ambulance sometime. (FG 2 DA1)
routine change relationships increased understanding	Relationships and role perception The new case management role for doctors' assistant led to changes in their everyday routines. The relationships and role perception category describes participants' perceptions of their changed relationships to patients and GPs and their new role generally.
improved relationship improved communication more intensive interaction greater trust care givers, continuity of care change in regular practice	Improved relationships, continuity of care and awareness of the patient All described how their new role as case manager had improved their relationships with patients. These had become closer, more intensive and involved more contact, resulting in more personal relationships: Well, I find the contact with the patient is really a lot more intensive than it used to be, which is a new experience for me and for the patient (FG 2 DA1) That is really more intensive and they entrust more to us (FG 2 DA5) According to many participants, this perceived improvement in the relationships resulted in patients identifying doctors' assistants as caregivers, which facilitated continuity of care. Patients started to seek consultations with the doctors' assistants, which was described by participants as a positive experience, but it could lead to difficulties such as lack of time during normal practice working hours: When they then come to see you in the practice, their eyes are also looking for you, you do realise that. But that is not at all unpleasant. (FG 4 DA25)
patient centered backgrounds environment enhanced context	The majority participants reported developing greater understanding of patients' backgrounds and psychological well-being, in terms of patients' social environments: For me, it was a real experience to see in what kind of a domestic environment he lives now... Because that's something one couldn't really place beforehand. (FG 2 DA1) Or that one just simply pays attention to the oedemas. They sit on the examination table and then you look – ''Oh, do you have swollen feet?!'' etc. I do notice myself there. (FG 3 DA14)

Level Two Coding, Article 009

STAFF ATTITUDES ARE POSITIVE ○ motivation and involvement influence attitude ○ attitude change ○ staffing solutions

- mostly positive

STAFF FEEL SUPPORTED
- increased communication
- feedback valued
- shared responsibility
- time and attention appreciated
- support from leadership
- increased understanding
- team support
- discussion positive
- support

PATIENTS INTERESTED IN COLLABORATION
- satisfaction
- being heard
- collaboration
- the need to prove

INTERVENTION IMPROVES WORKFLOW
- time importance
- effective time scheduling
- best practice
- emergence of new strategies
- routine
- unclear protocol

COERCION BY MANAGEMENT
- nominations negative
- coercion negative

STAFF UNAPPRECIATED
- no support
- underappreciated
- double burden
- staffing issues
- unofficial overtime
- assumptions
- insecure

PATIENTS UNMOTIVATED
- minority negative
- poor patient motivation
- collaboration unappreciated
- elderly care issues
- disconnect
- perception problems
- lack of initiative

QUALITY OF CARE
- disease specific
- patient centered
- backgrounds
- environment
- enhanced context
- continuity of care

IMPROVED STAFF RELATIONSHIPS
- relationships
- increased understanding

- improved relationship
- improved communication
- more intensive interaction
- greater trust

PATIENTS INTERESTED IN IMPROVEMENTS
- participants satisfied
- disease specific management successful
- physical activity
- motivation
- medical understanding
- personal improvement
- improve detection
- personal habits
- observation

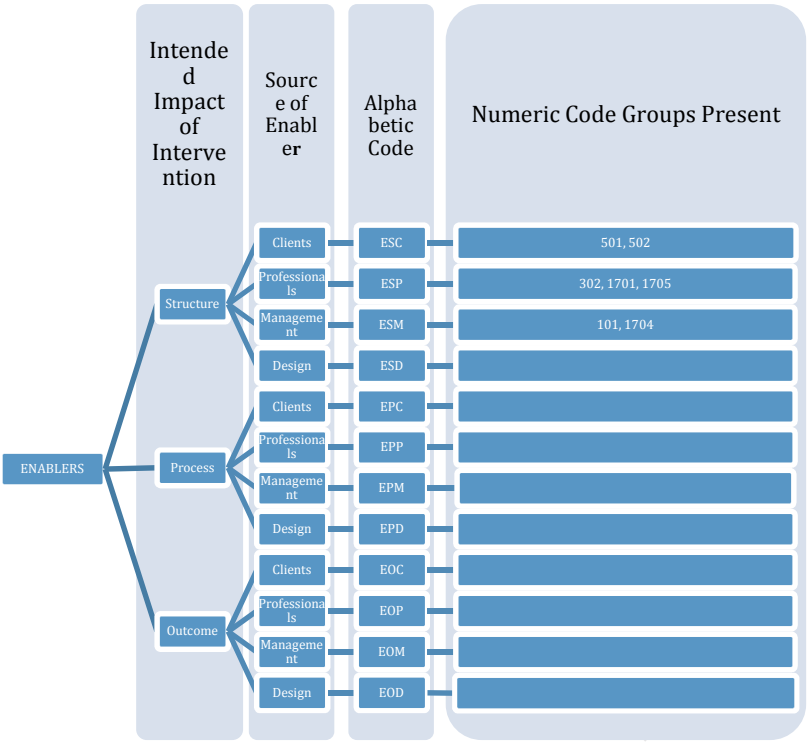
STAFF BECOME EMOTIONALLY INVOLVED
- emotional involvement
- self doubt

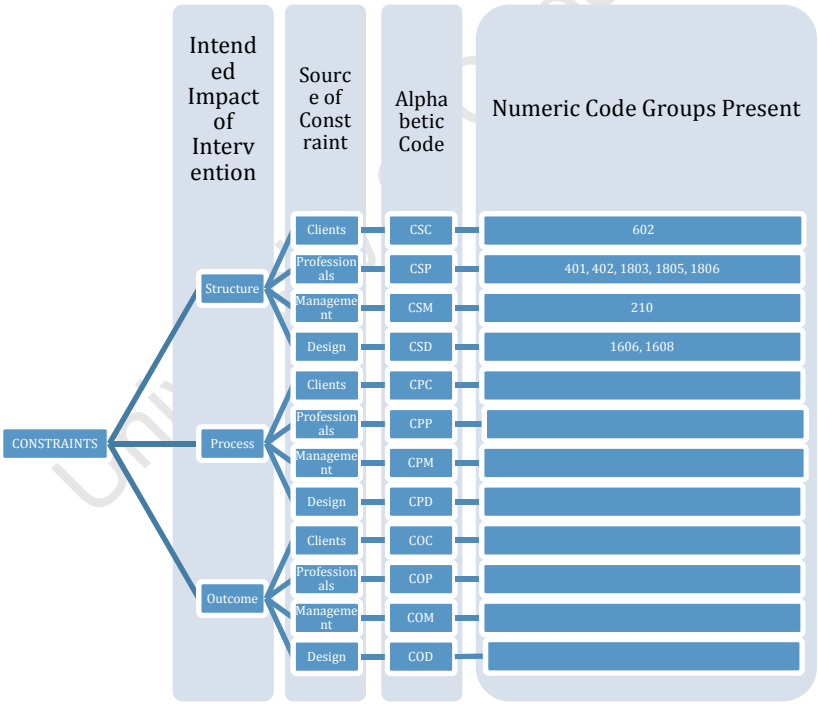
INTERVENTION DISRUPTIVE TO STAFF
- change in regular practice
- routine change
- care givers

Level Three Coding, Article 009

ENABLERS
STAFF ATTITUDES ARE POSITIVE - 1704 STAFF FEEL SUPPORTED – 1705, 1701, 302, 101 PATIENTS INTERESTED IN COLLABORATION – 501, 502
CONSTRAINERS
COERCION BY MANAGEMENT - 210 STAFF UNAPPRECIATED – 1803, 402, 401 PATIENTS UNMOTIVATED - 602 STAFF BECOME EMOTIONALLY INVOLVED – 1805, 1806 INTERVENTION DISRUPTIVE TO STAFF – 1606, 1608

Visual Account of Coding:


Intended Impact of Intervention
Source of Enabler
Alphabetic Code
Numeric Code Groups Present
ENABLERS
Structure
Process
Outcome
Clients
Professionals
Management
Design
ESC
ESP
ESM
ESD
EPC
EPP
EPM
EPD
EOC
EOP
EOM
EOD
501, 502
302, 1701, 1705
101, 1704


Intended Impact of Intervention
Source of Constraint
Alphabetic Code
Numeric Code Groups Present
CONSTRAINTS
Structure
Process
Outcome
Clients
Professionals
Management
Design
CSC
CSP
CSM
CSD
CPC
CPP
CPM
CPD
COC
COP
COM
COD
602
401, 402, 1803, 1805, 1806
210
1606, 1608

Appendix 6-010: Coding

Level One Coding, Article 010

Label	Text
increase patient and provided depression knowledge increase access to evaluation and treatment VA endorsed screening KP endorsed improved management positive reaction respect	In the priority-setting process, high-level management at each organization indicated the importance of increasing provider and patient knowledge about depression. Both organizations also endorsed increased access to depression evaluation and care. The VA, but not KP leadership, endorsed screening for depression in primary care and referring all detected patients to mental health specialists. Only KP endorsed improved management of depression in primary care. QI teams reacted positively to receiving, and indicated they would aim for, the priorities endorsed by management, even when they disagreed with them. For example, VA QI teams disagreed with management's goal of referring all depressed patients to mental health, but preferred knowing about this issue up front.
mostly followed protocol pilot testing required further resources communication with QI board	The QI team process followed the protocols outlined in the manual with a few exceptions. One team (VA-CT) developed its proposal in less than 10 hours of meeting time, as opposed to the recommended 16. Only the VA teams conducted pilot test cycles and used the resulting information to improve their intervention programs. All three LTs and both CTs requested additional resources or used materials from the DIRC. All teams both orally presented, and submitted in writing, their proposed interventions to their organizations' quality improvement bodies within the specified time period.
   individualized strategies incorporated collaborative care model CTS implemented more planned strategies	Understanding Team-based Quality Improvement Table 2 focuses on QI team depression improvement interventions. The table shows the individual strategies included in each team's depression improvement intervention program, the expert rating for each strategy (SR), EBI summarizing the SRs, and the OPQI reflecting expert ratings of each program considered as a whole. The table also indicates which strategies were planned, planned and implemented, or subsequently implemented though not planned initially. Overall, team intervention strategies addressed most key elements of the collaborative care model (Von Korff et al. 1997), including patient and provider education, detection, assessment, and case management. Two teams planned, but did not implement, strategies for collaboration with mental health specialists, the remaining key element of collaborative care. CTs within each organization had higher ratios of imple- mented to planned strategies (CT mean 89 percent versus LT mean 68 percent) and the higher EBI ratings. The LTs had both the highest and the lowest OPQI scores. The VA-CTs and -LTs had lower EBI scores than their KP counterparts.
various costs of intervention	In terms of costs, KP-LT #2 designed the least ambitious intervention program and was least costly. The KP-CT team members charged $7,018; KP- LT #1 charged $6,147; and KP-LT #2 charged $1,859, all for team member time. Charges to the KP Clinical Innovations Program for program implemen- tation show a similar pattern. The KP-CT applied for and received $101,762 (to cover two primary care practices) and KP-LT #1 applied for and received $64,741. The KP-LT #2 did not apply for implementation resources. At the VA, charges to the grant were for CT project management ($7,730), CT computer support ($1,760), LT intervention support ($1,760), and LT computer support ($200). Support from the VA Performance Improvement Council was in-kind, and not measured. Overall, the 10 VA and KP leaders willing to estimate their time indicated spending between 60 and 882

various time required	hours on the project over the two years of planning and implementation. For KP leaders, these estimates indicate that more than three-fourths of the time spent was not charged.
results consist with literature positive support factors key interdisciplinary team, support, engaged leadership, flexible problem solving	Results of our QI team participant panel agreed substantially with the results of our literature review in terms of the factors that might most affect the success of the QI process. Panelists generated 64 percent (16 of 25) of factors we had identified from the literature (Appendix 3, available from the authors) and ranked multidisciplinary team membership, support from mental health specialty, and team leader interest in depression or flexible problem solving during implementation (a tie) as the three most important factors. We termed the factors identified by the panel or literature review as positive factors for QI.
positive factors vary clinic majority, participation mandate, multiple stakeholders LT more positive CT slight deviations	Table 3 shows how QI teams varied in the extent to which they manifested positive support factors for QI. Positive factors could vary across teams by design, because of poor adherence to the design, or because of natural differences. Factors are listed as high, moderately high, moderate, or low, based on study records or process notes. The following factors are not listed in Table 3 because they were rated as uniformly ''High'' both as designed and as implemented: clinician majority on teams, organizational mandate to partici- pate, and multiple stakeholders have a voice in planning. Two factors (flexible problem-solvers during implementation and leadership by respected local peers) were omitted because we did not collect sufficient data about them. As shown in Table 3, the LT design included more positive factors, but LTs varied more than CTs in the extent to which they manifested characteristics we had tried to engender through our designs for team structure, protocols, and materials. For CT's as implemented, the only substantial deviations from expectations were lower support from clinical practice leadership in one KP-CT practice, lower involvement of pharmacists and higher use of CQI methods.
planning average of 4.5 months implementation average 6.5 months mostly successful reliance on computer medical record software terminated after one year	Intervention planning took an average of four and a half months. Full intervention implementation occurred an average of six and a half months after the end of planning. All intervention programs except KP-LT #2's were active more than six months after full intervention implementation, but only the KP-CT and KP-LT #1 programs were active more than one year after full implementation. The two VA team interventions depended heavily on the computer medical record, which displayed screening test results and was the basis for summary data for feedback. One year after full implementation the software for the computer record was changed, making the system inaccessible to the teams. In the context of simultaneous facility integration, this was enough to end the active phase of the interventions at the VA.
teams participated in improvement acitvies VA-LT initiated new sustainable consultation system staff shifting	Team leaders and members often participated in depression improve- ment activities after the end of the study at intervention sites. The KP-LT #2 leader and pharmacist participated in a subsequent depression medication case-management intervention at their facility. Frustrated with lack of coordination of mental health consultations, the VA-LT worked with psychiatry to initiate a new, prompt psychiatric consultation system that persisted after the full intervention ended. At KP-LT #1, the intervention case manager became the behavioral health specialist required by a newly adopted KP primary care practice redesign model. In one of the KP-CTs the practice continued the intervention case manager's position after the innovations funding stopped, but also hired another behavioral health specialist. Ultimately, the two positions came into conflict and the case manager left.

	Table 3 also shows the relationship between each team's positive factors for QI and that team's outcomes in terms of developing a high-quality, long- lasting program. The KP-LT #1 had the highest score for positive QI factors, followed by KP-CT, VA-CT, VA-LT, and KP-LT #2, in that order. Outcome scores for program quality and longevity followed the same order. Aggregating the scores from Table 3 across teams (not shown on the table), CTs scored about the same as LTs on positive factors (1.54 CT versus 1.62 LT) and better on outcomes (2.33 CT versus 1.00 LT). The two CTs implemented their interventions in practices with equivalent positive environmental factors (1.33 KP-CT versus 1.33 VA-CT). Two of the three LT's had more environmental support than CTs and one (VA-LT) had less. In the two PC practices with the lowest environmental support factors for QI (KP-CT Practice A and VA-LT) the CT but not the LT produced an enduring program. KP teams scored better than VA teams on positive factors (1.67 KP versus 1.48 VA) and outcomes (2.11 KP versus 1.17 VA).
QI leadership necessary for success support necessary for success	Two teams experienced outstanding success in developing a high-quality program that remained active for more than a year after full implementation (KP-CT and KP-LT #1), one team had moderate success (VA-CT), and two teams had low success, with KP-LT #2 having the lowest ratings for program quality and duration of implementation. No team that did not have high ratings on two of three of the QI team leadership measures (interest in depression, content expertise, and participation) succeeded. No LT depression improvement program succeeded in a practice without high ratings on either support from mental health specialty or clinical practice leadership.

Level Two Coding, Article 010

SUPPORT FROM THE LARGER SYSTEM
- VA endorsed screening
- KP endorsed improved management
- positive reaction
- support necessary for success

ENGAGED LEADERSHIP NEEDED
- QI leadership necessary for success
- engaged leadership

STAFF WORK AS A TEAM
- respect
- communication with QI board
- interdisciplinary team
- support
- flexible problem solving
- clinic majority

INTERVENTION INCREASED EDUCATION FOR ALL
- increase patient and provider depression knowledge
- participation mandate

INTERVENTION INCREASE ACCESS
- increase access to evaluation and treatment

PLANNING IS CRITICAL
- multiple stakeholders
- LT more positive
- CT slight deviations
- planning average of 4.5 months

- mostly followed protocol
- pilot testing
- implementation average 6.5 months

IMPLEMENTATION HEAVILY USES RESOURCES
- required further resources
- various costs of intervention
- various time required

INTERVENTION MOSTLY SUCCESSFUL
- results consist with literature
- mostly successful

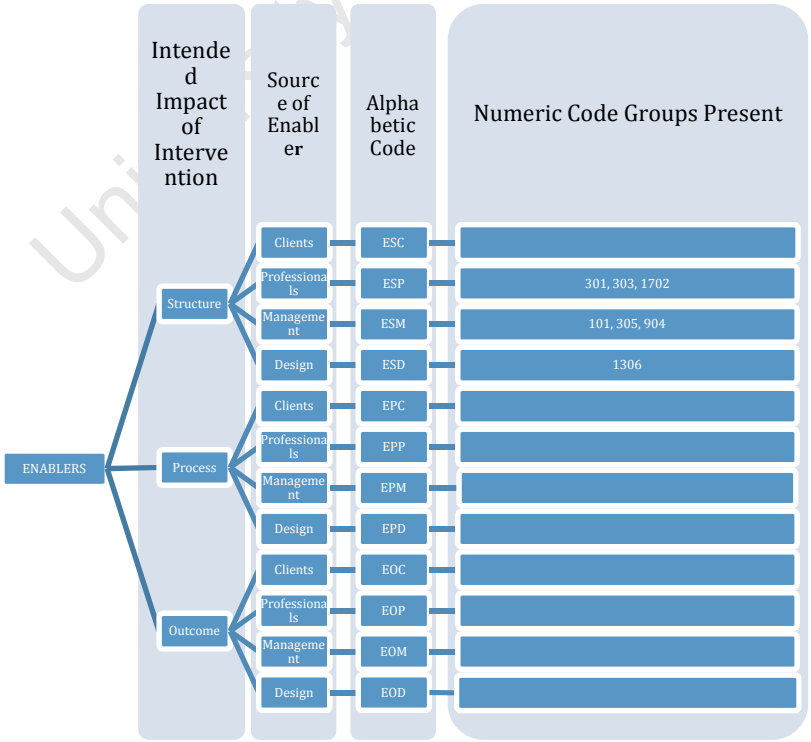
INTERVENTION UNABLE TO BE ADOPTED
- reliance on computer medical record
- software terminated after one year

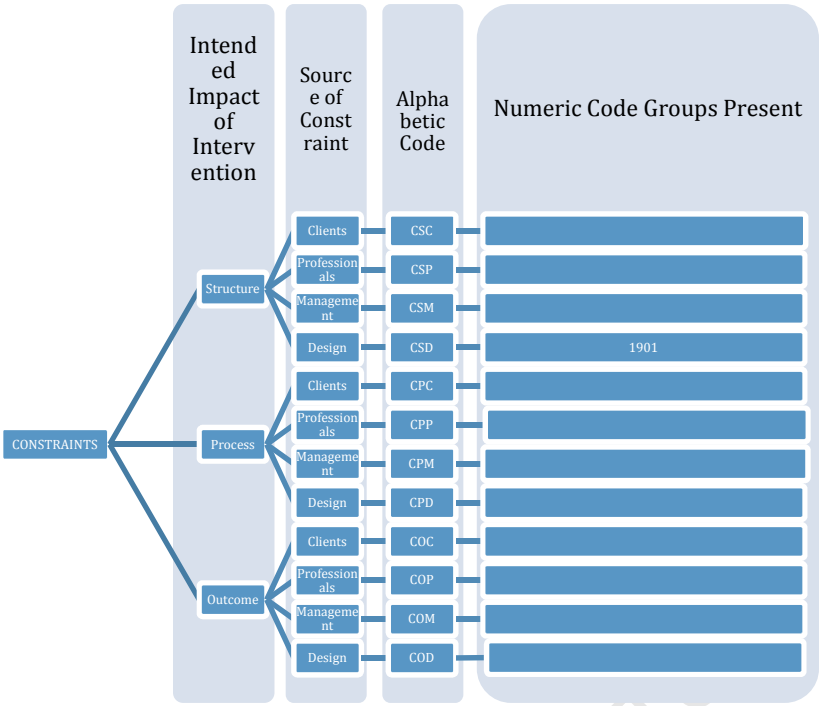
STAFF CONTINUED OWN VERSION
- teams participated in improvement activities
- VA-LT initiated new sustainable consultation system
- staff shifting

Level Three Coding, Article 010

ENABLERS
SUPPORT FROM THE LARGER SYSTEM - 905 ENGAGED LEADERSHIP NEEDED – 101, 305 STAFF WORK AS A TEAM – 303, 301, 1702 PLANNING IS CRITICAL - 1306
CONSTRAINERS
IMPLEMENTATION HEAVILY USES RESOURCES - 1901

Visual Account of Coding:





Appendix 6-011: Coding

Level One Coding, Article 011

Label	Text
	Differences in health promotion activities between the two supervisory models: The comparative health promotion activities of the two PCU were assessed by semi-structured interview, reviews of monthly reports, and an observational checklist, to ascertain whether the health officers followed the core health promotion activities package.
required health promotion activities	*Supervisory model 1* The health promotion activities of the health officers in PCU 1 were prenatal care, such as teaching pregnant women, assessment of nutritional status, assessment of mental condition, promoting nutrition for children to solve malnutrition problems, assessment of development in pre-school age and autistic children, assessment of nutritional status in school-age children, health education for various community groups, and an annual physical check-up campaign for people ≥21 years. Establishment of an exercise club in the village was a community health promotion activity.
additional activities community focused	*Supervisory model 2* The health promotion activities of the health officers in PCU 2 were the same as for model 1. Additional activities comprised coordinating and supporting the community committee for health and quality of life development through organizing community activities, for example, by providing a training program to enhance consumer and food vendors' knowledge of food safety, clean food/good taste, providing social support for specific patient groups such as diabetes, hypertension, and obesity self-care. Before supervision, the PCU 2 community already had a health promotion and quality of life development club. The major activities were providing health education for pre-school parents on National Children's Day; organizing a training camp for teenagers and parents; setting up information boards for an accident prevention campaign, and setting up activities and responsibilities for sanitation and environmental health improvements in the village.
supervisors eager to participate ownership learn more about community community pride multidisciplinary team supported reinforced health promotion activities promote own health facilities greater openness required improved outcomes	*Opinions of community leaders, PCU officers and supervisors about the supervisory models:* All community leaders said that they were very pleased about the opportunity to participate in the supervision because it was very useful and exactly what they needed. Participatory supervision made it possible for them to learn the problems of the community and to help solve them. They were proud to be part of the community development team with people with differing areas of expertise. The PCU officers felt that participatory supervision for community leaders was very useful. It made them feel that they were not alone in providing health services, but that there were people in the community giving them support, particularly with community health promotion. In addition, the community leaders could provide opinions from their own perspectives regarding problems in the health center and help to promote health in the community. However, they felt participatory supervision should be more open to community leaders regarding health issues, to gain greater input, comments and suggestions for their health operations. The supervisors felt that the participation of the PCU officers and community leaders provided better community health promotion outcomes than the other supervisory model. It accounted for more community activities, greater participation, and a sense of

community activities greater participation belonging	belonging. They expected participatory supervision from the PCU officers to have a greater effect on improving the PCU than supervision with only PCU health-worker participation.
changes post implementation administration of supplies family folder use democratic approach problem solving as a team, respect, increased working knowledge increased report writing skills increased workload problem analysis issues problem soling issues conceptual disagreements within team, participatory supervision progress issues, over obligated	*Strengths and challenges of the PCU officers' participatory supervision (model 1)* *Strengths*: First, after supervisory model 1 was implemented some changes occurred in the administration of medical supplies and family folder use in the PCU. (The family folder is a folder that contains brief health information of all family members, a genogram, family members' general characteristics, major health problems of each and progress notes on treatment). The records for health promotion services and annual physical examinations were completed. The second strength was its democratic characteristic. When the health officers collected the working results, analyzed the problems' causes and alternatives, and decided on the correct methods, they also gained the ability to analyze problems, and the skills to find solutions, acquiring wider perspectives and diversity in problem solving. Problem solving teamwork helped brainstorming, it involved acceptance and respect between the supervisors and the health officers. In addition, the work in the PCU had become systematic, and the health officers had increased working knowledge regarding advising clients and writing up health reports correctly. The feedback data were used for healthcare service development. *Challenges*: The health officers had an increased workload due to collecting work results, preparing problem analysis and problem solving for presentation to their supervisor. Moreover, the participation required had the potential to cause conceptual arguments among the team that could lead to conflict. From the standpoint of the participants, the officers' participatory supervision did not always proceed well, and not all health officers could participate in every step of the supervision process, due to their client service obligations.
changes in administration of supplies and other healthcare practices worked with community feedback for the community by the community increased community self development reduced discrimination greater participation	*Strengths and challenges of PCU officer and community leader participatory supervision (model 2)* *Strengths:* First, as a result of implementing supervision, changes occurred in the administration of the medical supplies and healthcare practices in the PCU. Regarding health promotion, the health officers were able to work with the community health improvement and quality of life development committee in PCU 2 and the community leaders in order to solve problems. Second, community leaders felt authorized to give feedback to the PCU regarding community problems. Third, in this supervisory model, community health promotion by the community itself worked best. This was because of community empowerment from the process of building the knowledge, skills and experiences to enable increased community self-development. The process of equal participation, without discrimination according to social status, strengthened the community and promoted greater participation. Therefore, the benefits of participation decreased reaction to change. Fourth, the participation of a wide variety of people assisted in rapid development of the community. Fifth, from observation of participatory supervisory model 2, community leaders demonstrated cooperation and participated in sharing their opinions, presenting problems and giving advice to the health officers. Every officer in the PCU attended every supervision session. In this supervision model, the roles of both PCU health officers and community leaders changed from

serious participation by supervision open communication, health problem identification, locally driven solutions superior's role as focus slow start constructive adaptation great understanding of role increased workload conflict, time issues	previous styles. Previously, the community leaders received supervision from the health officers. In contrast, with this supervision model, the community leaders played roles as supervisors while the PCU officers were supervised. They could express their demands, identify health problems and suggest solutions based on local wisdom focusing on health promotion activities. The roles of the supervisors at the district level were to control the operation according to the PCU standards and ensure that there was active participation among the partners. This new model of supervision focused on the supervisor's role, and thus the results of supervision in the first two sessions were unsatisfactory. In the third session, the officers and community leaders started to adapt, so that supervision was more constructive. Consequently, the supervisor had a clearer role in providing knowledge to the officers, similar to being a teacher. *Challenges*: The challenges are similar to those of model 1, with increasing workload and conflict between the PCU health officers and community leaders during discussions. In addition, community leaders had to allocate their time to participate in the supervision.

Level Two Coding, Article 011

STAFF WORK AS TEAM
- respect
- democratic approach
- problem solving as a team

STAFF AND MANAGEMENT FEEL OWNERSHIP
- learn more about community
- community pride
- multidisciplinary team
- supervisors eager to participate
- supported
- ownership
- greater participation
- belonging
- worked with community
- open communication

CONCEPTUAL DISAGREEMENTS
- conceptual disagreements within team
- greater openness required

MANAGEMENT OVEREXTENDED
- serious participation by supervision
- increased workload
- participatory supervision progress issues
- over obligated
- reinforced health promotion activities
- promote own health facilities

INTERVENTION REQUIRES DEDICATION
- required health promotion activities
- additional activities

INTERVENTION VERY COMMUNITY FOCUSED
- locally driven solutions
- community focused
- community activities
- for the community by the community

- increased community self development
- reduced discrimination
- greater participation

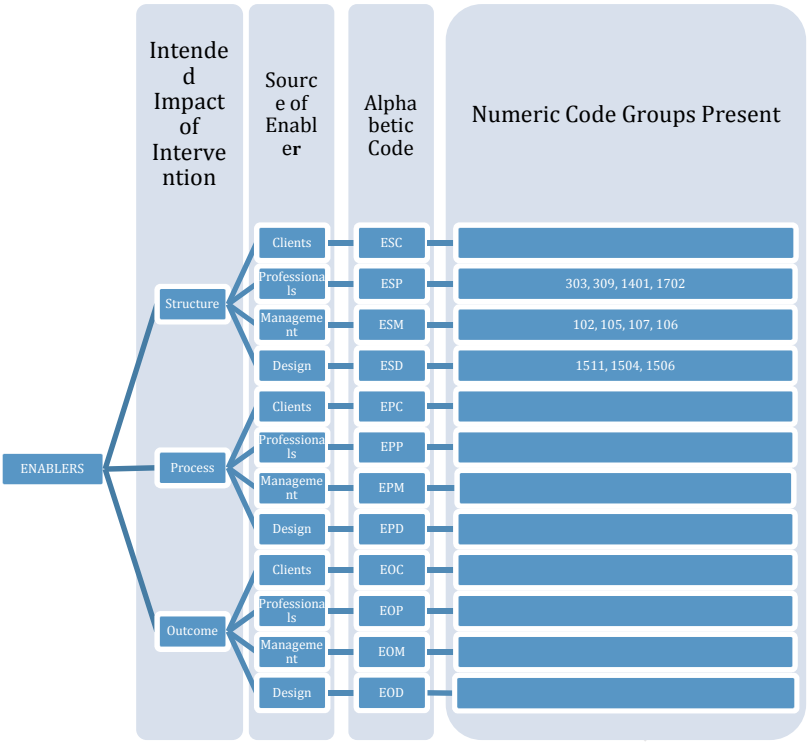
INTERVENTION IMPROVED PRACTICE
- increased working knowledge
- increased report writing skills
- changes post implementation
- administration of supplies
- family folder use
- changes in administration of supplies and other healthcare practices
- feedback
- superior's role as focus
- improved outcomes

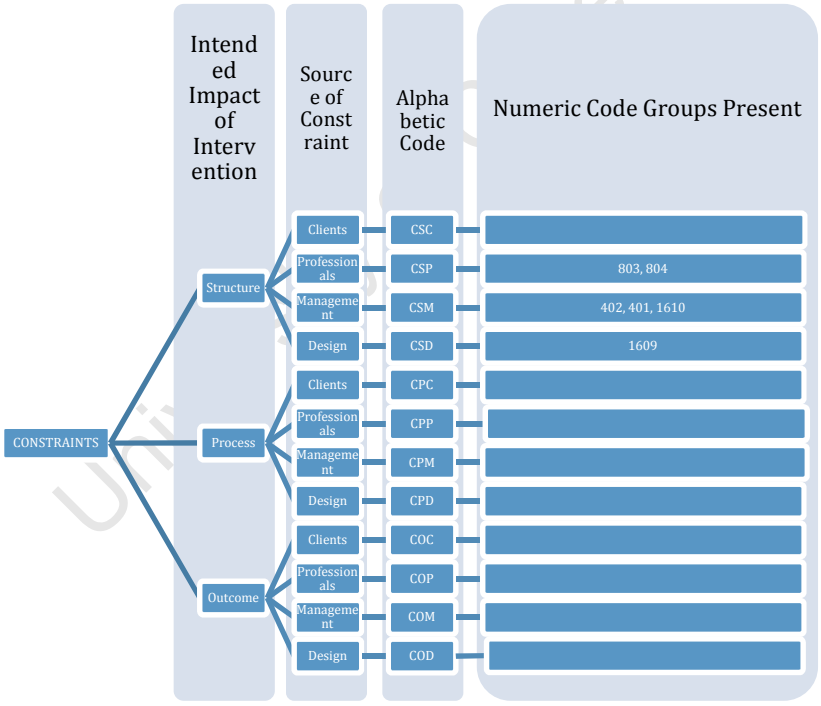
INTERVENTION INCREASED WORKLOAD
- increased workload
- conflict
- time issues

INTERVENTION UNABLE TO SOLVE ALL ISSUES
- problem analysis issues
- problem soling issues
- slow start
- constructive adaptation
- great understanding of role
- health problem identification

Level Three Coding, Article 011

ENABLERS
STAFF WORK AS TEAM – 309, 303, 1702 STAFF AND MANAGEMENT FEEL OWNERSHIP – 102, 105, 107, 106, 1701 INTERVENTION VERY COMMUNITY FOCUSED – 1511, 1504, 1506
CONSTRAINERS
CONCEPTUAL DISAGREEMENTS – 804, 803 MANAGEMENT OVEREXTENDED – 1610, 401, 402 INTERVENTION REQUIRES DEDICATION - 1609


Intended Impact of Intervention
Source of Enabler
Alphabetic Code
Numeric Code Groups Present
ENABLERS
Structure
Process
Outcome
Clients
Professionals
Management
Design
ESC
ESP
ESM
ESD
EPC
EPP
EPM
EPD
EOC
EOP
EOM
EOD
303, 309, 1401, 1702
102, 105, 107, 106
1511, 1504, 1506


Intended Impact of Intervention
Source of Constraint
Alphabetic Code
Numeric Code Groups Present
CONSTRAINTS
Structure
Process
Outcome
Clients
Professionals
Management
Design
CSC
CSP
CSM
CSD
CPC
CPP
CPM
CPD
COC
COP
COM
COD
803, 804
402, 401, 1610
1609

Appendix 7-001: Consolidated Coding Chart – Detailed

Closing the gap: a review of factors affecting quality improvement interventions at the primary care level

Part E: Editorial Opinion - *Fixing Patient Safety: The Call for Patient-Centered Care*

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May 2012

Introduction

The term “bedside manner” has fallen into disuse, and may well be regarded as being somewhat archaic. The concept of optimal patient-physician interaction, however, continues to be the subject of much discussion, albeit with a new vocabulary. The need for ongoing quality improvement interventions at the systemic and management levels is well established (Gilson et al., 1995; Vincent et al., 1998). But improvement is also needed to address shortcomings in the way health workers interact with patients (Woolf, 2004; Li, 2006). This paper argues that patient well-being should be the chief emphasis in effecting quality improvements (QI) in primary care, as a pre-condition for success in QI initiatives that are directed at all aspects of care.

“Can health care really ever be high quality if the patient-physician interaction is hurried, disrespectful, cold, callous, and uncaring?” This question is posed by medical doctor James Li (2006: p.). Patients are more interested in their own ailments, and the attention they receive, than in how a health system operates (World Health Organization, 2008). Health care is delivered to people (patients) by people (physicians and other health workers). The frustration and insensitivity experienced by patients as they navigate health and treatment options is indicative of gaps in quality (Woolf, 2004). Patients, who tend not to have medical backgrounds, are unable to rate health workers on their technical abilities. Instead, patients assess communication and other “soft skills” such as flexibility, diplomacy and personal traits (Reynolds, 2009). The central question posed by this article, then, is this: What enables and constrains the implementation of quality improvement interventions at the primary care level, in relation to health worker-patient relationships?

A systematic review of the literature concerned with QI in primary care settings (across different economic backgrounds), conducted by the author of this paper, revealed recurring themes in the enabling and constraining factors impacting documented initiatives. The key dimensions of quality have been defined by the Institute of Medicine (2001), namely safety, timeliness, effectiveness, efficiency, equity, and patient centeredness, were mentioned with differing degrees of frequency in the literature reviewed. The literature revealed little explicit mention of the role of the patient-health worker relationship as a component of primary care quality, although it may arguably be regarded as an attribute of the oft-mentioned “patient-centredness” element of quality. This relationship has alternately been cited as a separate, “seventh element of quality (Mendoza et al., 2011)”. The prevailing emphasis on other aspects of quality, and the “Pay for Performance” (P4P) incentives that have been instituted as a QI initiative (Mendoza et al., 2011), have arguably contributed to a lack of emphasis on patient-physician relationships. In fact, the preoccupation with efficiency resulting from P4P may be viewed as a constraining factor improving relationships, as the time available for individual patients during clinical visits is viewed by physicians as being inadequate for meaningful encounters (Mendoza et al., 2011). In the

systematic review of eleven articles identifying quality improvement interventions in primary care settings, analysis revealed that none of the QI initiatives were concerned with influencing outcomes, as framed by Donabedian (1980); instead, the interventions were directed at structure or process. The Institute of Medicine (2006: p. 172) says “outcomes are the direct result of a patient’s health status as a consequence of contact with the health care system.” This paper will argue that patient satisfaction is an important part of such outcomes. It will also argue that patients perceive the quality of outcomes to be disproportionately a product of the relationship enjoyed with the care-giver, rather than any other aspect of the care system. QI initiatives aimed at the primary care level are, therefore, currently concerned with aspects of the system that are not necessarily valued by the patient.

Patient Expectations of Patient-Centred Care

The literature reviewed focuses on the role of physicians, but it may be argued that the ideals described may be equally relevant to other health workers, who frequently act as the principal interface with primary care systems. While lacking the technical vocabulary to articulate expectations, patients do hold certain expectations about their interactions with a healthcare system in general, and of the desirable or ideal attributes of physicians and other care-givers in particular. These expected attributes have been extensively documented. Benapudi et al., define the ideal physician as empathetic, forthright, humane, personal, respectful, in addition to thorough and confident (Li, 2006). Likewise, Pellegrino suggests that a good physician possesses "benevolence, compassion, courage, fidelity to trust, intellectual honesty, prudence and truthfulness” (Li, 2006). Patients want health workers who can relate to people and assist them as they traverse various health choices (World Health Organization, 2008). Patients want patient-centred care, care in which a patient’s needs and patient satisfaction, not treatment, are the priority (Reynolds, 2009). Rather than focus on the disease or ailment, patient-centred care is individual and focuses on holistic aspects of the patient as a person, while at the same time involving the patient in their own care (Reynolds, 2009). Patient centeredness does not equate to patient’s controlling their care, but is rather a mutual understanding which enables health workers to react to patients’ individual needs (Stewart et al., 2000). From the foregoing it may be concluded that a significant consensus exists on the nature of patient expectations about primary care providers.

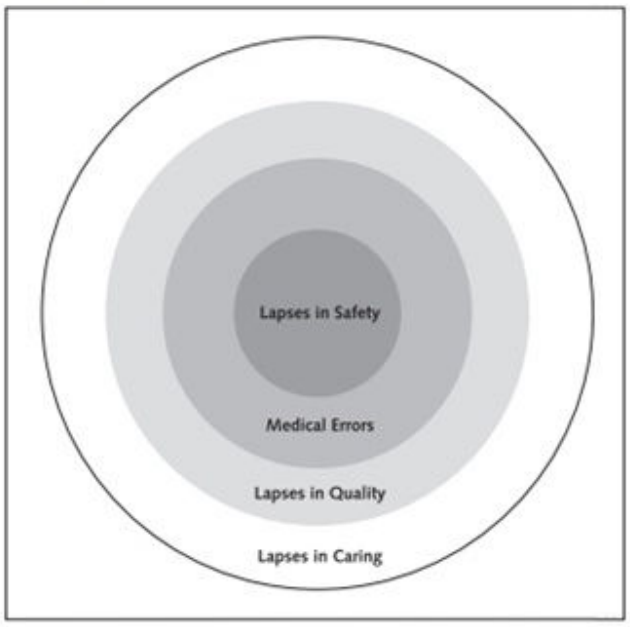
A working definition of patient-centred care also emerges from the available literature. The World Health Organization (2008) recognizes better integration of preventative care, rather than merely reactive care, as a distinct aspect of patient-centred care. A variety of models have been developed to describe the concept within broader quality considerations, a number of which are discussed here.

Primary care physicians have also been shown to have expectations of what constitutes an appropriate patient-physician relationship in the context of quality care (Mendoza et al., 2011). The ideal relationship desired by these physicians is largely characterised by the same attributes as those expected by patients. It may be expected that other health workers share these ideals.

Descriptive Models of Patient-Centred Care

In the quality literature a principal concern is often that of patient safety. Woolf has developed a model which depicts patient safety in relation to other quality dimensions (Woolf, 2004), and which contextualises its importance. This model, which depicts successive types of lapses in care delivery as concentric circles, suggests that patient care consists of a series of defences against harm. Compromises in patient safety thus occur once other defence mechanisms, such as caring behaviour and adherence to quality, have been breached. The best way to ensure patient safety is therefore to ensure that the outer defences are maintained, by offering caring, high quality treatment. An undue emphasis on patient safety can therefore be considered to constitute an admission of failure in providing the other dimensions of care quality. Woolf's model is depicted in Figure 1.

Figure 1: Organisational framework for definicies in health care services (Woolf, 2004)



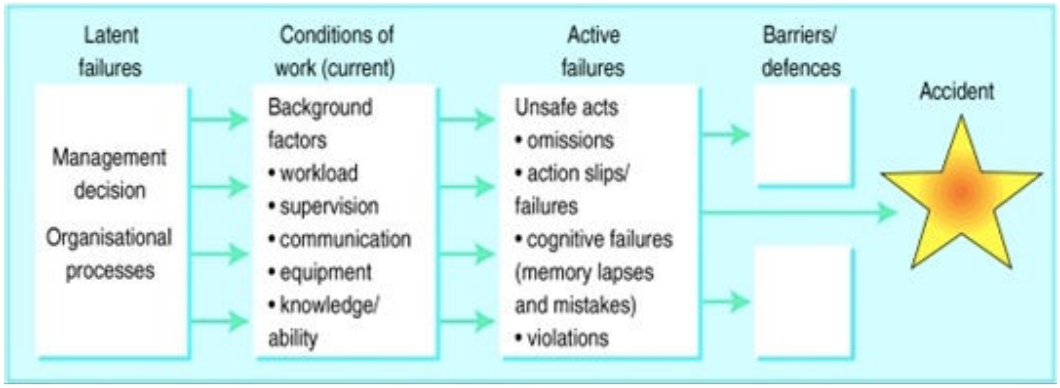
None of the foregoing suggests that patient safety must be minimized. Patient safety has become an increasingly substantial component of health care (Ho et

al., 2010), which can be improved by investigating the system failures that may harm a patient (World Health Organization, 2005 as cited in Ho et al., 2010). A safe health care system ensures errors are visible to health workers in the system, in order to correct the errors before causing harm (Nolan, 2000). For this to work, failures must be reported so that root causes and other factors can be examined, thus requiring that transparency be a key component of patient safety. If it is accepted that a breach in patient safety is the culmination of other, earlier failures, it may be argued that such investigations or quality reviews should focus strongly on Woolf's "gaps in therapeutics, respect, and compassion" (Woolf, 2004).

The World Alliance for Patient Safety, too, places an arguably undue emphasis on system-based interventions and organizational culture changes, and warns against than "the denunciation" of health workers as being responsible for failures (World Health Organization, 2008). This is emphasized for low-income countries, where patients might be even more exposed to patient harm than in high-income countries. As many as 10% of patients in high-income countries experience harm caused by unavoidable adverse events (World Health Organization, 2008). Patient safety is, however, only one small component of quality improvement, as the above percentage suggests; other sources of deficiencies in care exist. A health system that focuses primarily on improving patient safety is an inefficient health system. Quality improvement is only beneficial if it focuses on the principal offenders of quality lapses; this arguably includes lapses in compassionate caring, which are precursors for subsequent failures in safety.

Vincent et al. (1998) have developed a descriptive model of quality failures which suggests an inherent chronology in errors and breakdowns. In a hierarchy of medical organization, errors can be attributed to the institutional context, the organisation and management, the work environment, the care team, the individual team member, tasks, and patients (Vincent et al., 1998). Human decisions or actions are involved in almost all accidents, as human interactions (and the processing of information) are central to health care (Vincent et al., 1998; Nolan, 2000). Accidental errors may occur either through active or latent failures (Vincent et al., 1998). Active failures are unsafe actions which have an immediate consequence, such as action slips (wrong tool), cognitive failures (memory lapse) or a violations resulting from poor motivation (not following best practice) (Vincent et al., 1998). Latent failures involve the work environment and often result from decisions made by management, such as poor supervision, large workloads and stressful working conditions (Vincent et al., 1998). Active errors typically occur at the individual team member, task, and patient levels, whereas latent errors occur in institutional context, organisation and management, work environment, and care team levels (Vincent et al., 1998). In the context of Vincent et al.'s model, this paper argues that the most effective barriers and defences against harm are caring and compassionate attitudes on the part of health workers.

Figure 2: Active and latent failures (Vincent et al., 1998)



The Current State of Patient-Centred Care

There appears to be consensus in the literature on placing the patient experience at the centre of care, but the prevailing reality does not achieve this, according to the World Health Organisation's report titled "Now More than Ever" (World Health Organization, 2008), which describes conditions in high, low and middle income countries. Very few health workers, for example, have participated in person-centred care training (World Health Organization, 2008).

The World Health Organization recognizes that health workers rarely acknowledge patients' concerns about their ailments, or engage in discussion about problem management options, preferring to limit interactions to "simple technical prescriptions." (World Health Organization, 2008). Health workers tend to ignore the fact that a patient is a person, with physical, emotional and social concerns. Current incentives and payment systems (as implemented in US urban centres, for example) do not support this type of interaction between physician and patient, creating a further disincentive to person-centred care (Mendoza et al., 2011). The World Health Organization is, however, hesitant to suggest person-centred interventions. The majority of change strategies and quality improvement interventions are aimed at the systems level, targeting structure or process, to improve "patient safety." These interventions remain in safe, impersonal territory. A major constraining factor, then, can be said to be a general lack of recognition of the need for improvements in the area of relationships.

The prevailing emphasis on patient safety may not be entirely beneficial to patients. As it may deflect attention from other treatment quality considerations, the emphasis on patient safety can be detrimental to quality control (Woolf, 2004). Patient safety is a narrowly defined as "freedom from injury" (Woolf,

2004). Rather than focusing solely on patient safety, Woolf proposes proportionality. He suggests that the emphasis in care should be on other aspects, which, when neglected, result in lapses in safety; actual safety lapses are the consequence of a number of larger deficiencies in health care. Lapses in safety are at the core of medical errors, which are a subset of lapses in quality. The aforementioned lapses are incorporated in lapses of caring, which also "encompasses gaps in therapeutics, respect, and compassion that are undetected by normative quality indicators" (Woolf, 2004). Using patient safety as a proxy for care quality may therefore be regarded as being not only inaccurate and misleading, but as being actively detrimental to patient care. This emphasis thus also acts as a constraining factor to addressing other elements of quality, including the patient-physician relationship.

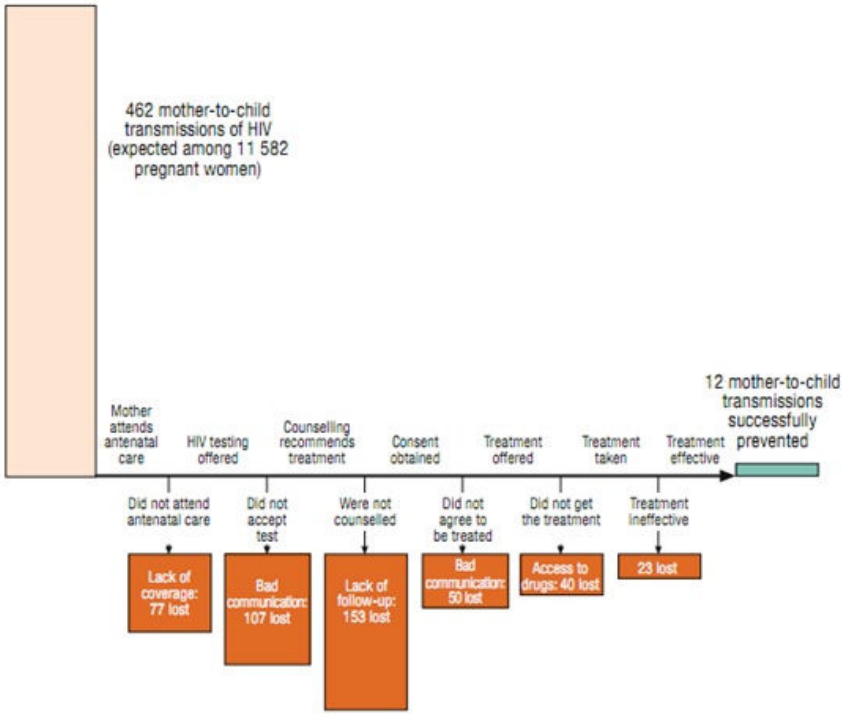
Physicians and other health workers are required to make informed decisions throughout the course of service delivery (Mathews and Pronovost, 2008). Health workers, adhering to standardized care and best practice, base these decisions on guidelines that aim to improve clinical outcomes (Mathews and Pronovost, 2008). This includes both profound and mundane decisions; the onus is on health workers to choose to sterilize equipment, wash their hands and continuously make other informed decisions. Yet, apparent indifference to patient welfare results in inherently unsafe practices. As much as 40% of 16 billion annual injections worldwide are administered with needles and syringes which are reused without sterilization (World Health Organization, 2008). Approximately 1.3 million lives, and many more life years, are lost because of unnecessary transmissions of HIV and Hepatitis's B and C, caused by unsafe injections (World Health Organization, 2008). Sterilizing a needle is a choice made by an individual health worker. Furthermore, in a hand hygiene observation study of 163 physicians, Pittet et al. (2004) found an adherence rate of only 57%. In addition to work and system constraints, physicians' identified knowledge and cognitive factors act as barriers to good hand hygiene. One can argue that these same constraints were noted for sterilization.

Additionally, patients only receive approximately half of recommended treatments (Mathews and Pronovost, 2008). A literature review, investigating the access to information in low-income countries, found a common lack of knowledge about the basic diagnostics and management of common diseases (Walsh and Bukachi, 2008). But health workers do not believe that the primary responsibility resides with them. A recent survey indicated that physicians believe that the hospital systems can prevent medical errors (Mathews and Pronovost, 2008). Quality health care should prioritize preventative care over reactive care for patients; this may lead to physicians and other professionals consciously, actively and continuously thinking about patient welfare as they perform their duties.

A culture of safety is composed of teamwork, trust, mutual respect, transparency, emotional intelligence, and communication (Swensen et al., 2009). Problems in

communication have been cited as the single greatest cause in medical errors (Lingard, et al., 2008). Poor communication is illustrated in an example from Cote D'Ivoire, which reveals that lost opportunities for prevention of mother-to-child-transmission of HIV are due to human errors related to communication. Out of a total of 462 cases, only 12 transmissions were averted (World Health Organization, 2008). Of the 450 cases that were not averted, 157 were lost to poor communication and 153 were lost to lack of follow-up counselling.

Figure 3: Lost oppertunities for prevention of mother-to-child transmission of HIV (MTCT) in Cote D'Ivoire (World Health Organization, x).



As a further example, a Canadian study assessed the impact of short briefings guided by checklists before medical procedures. Results show that communication failures per procedure declined from 3.95 pre-intervention to 1.31 post-intervention (Lingard, et al., 2008). Swensen et al. (2009) believe that teamwork and errors of communication are inextricably linked.

The Argument for Proportionality

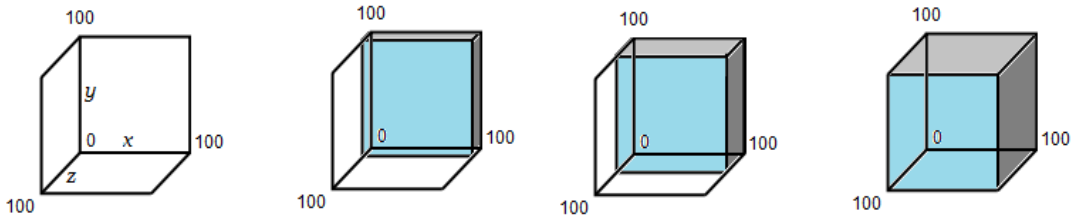
Proportionality argues that patient safety is a subset of medical errors, and merely an aspect of quality improvement. More recently, patient safety is the term applied to the prevention of medical errors and for quality improvement (Woolf, 2004).

Proportionality refers to the relative emphasis placed on various components within the approach taken to quality improvement. Quality improvements should be targeted *proportionally* to make the most impact. Health systems, and providers of care within the systems, are only able to dedicate a finite amount of time and resources to improve care (Woolf, 2004). As not all problems can be remediated simultaneously, decisions must be made that preclude certain areas from receiving attention (Woolf, 2004). This implies that the practical emphasis, and the allocation of resources, should be directed at areas where positive results are achievable. The examples below suggest that such approaches are viable.

Health workers are one component of the health system, and are not solely responsible for care. Health workers do, however, play a critical and pivotal role, and holding them accountable for the quality of care does not amount to a "denunciation", as purported by the World Alliance for Patient Safety (World Health Organization, 2008). In Mozambique, the Ministry of Health identified a lack of leadership and management capacity as the cause of poor service delivery quality in primary care (Perry, 2008). Problems ranged from poor communication to low health worker morale, to shortages of personnel. The ministry implemented a leadership and management development program in 11 health units, to invest in human resources and empower employees to improve service delivery (Perry, 2008). Among the results, one health unit increased the adherence to basic hygiene and bio-security standards by 67%, and another health unit decreased inpatient registry errors from 8.6% to zero (Perry, 2008).

Li's approach suggests that the empathy that patients receive from health workers will colour their entire perception of a health care interaction (Li, 2006). Therefore, it may be possible for the technical execution of a treatment to be faultless and completely compliant with quality standards, and for patient safety to be preserved without any compromise; yet, the patient may view the experience as being unsatisfying and sub-optimal, due to a perceived lack of compassion and empathy. Conceptually, this indicates that perceived empathy should not be regarded as being *additive* to the patient experience, but rather as a *multiplier* which determines satisfaction with the perceived outcome. The figure below depicts the concept in A, and three applications of this approach in B, C and D, where differing degrees of empathy are portrayed as being the key determinant of overall satisfaction.

Figure 4: Proportionality (Li, 2006).



A	B	C	D
x = Technical Compliance	High Technical Compliance	High Technical Compliance	High Technical Compliance
y = Patient Safety	High Patient Safety	High Patient Safety	High Patient Safety
z = Perceived Empathy	Low Perceived Empathy	Medium Perceived Empathy	High Perceived Empathy
RESULT:	**x** x **y** x **z** = Low Satisfaction	**x** x **y** x **z** = Medium Satisfaction	**x** x **y** x **z** = High Satisfaction

The expected benefits of patient-centred care are not limited to examples such as these, or to considerations of subjective patient experience, perception or satisfaction. Patient-centred care has led to general indications of improved outcomes in patient satisfaction, with better physician satisfaction and fewer malpractice complaints, while maintaining the same duration of office visits (Reynolds, 2009; Stewart et al., 2000). Patient-centred care tends to be more efficient, with reductions in subsequent diagnostic tests and referrals by half (Stewart et al., 2000).

Conclusion

The need for compassionate, patient-centred care is widely recognised, among patients and authorities in health-care provision alike. It is also recognised that care very frequently does not meet these ideals, regardless of economic setting. This is, in part, due to a disproportionate emphasis which has been placed on patient safety, particularly in high income countries) while safety should instead be viewed as one outcome of properly focused care. Proportionally, a far greater emphasis is required on the role of physicians and other primary care care givers, rather than on technical compliance with minimum standards of care. This emphasis is required in health worker education, and in the focus of quality improvement initiatives at large. It has implications for the proportional allocation of funding and resources, and thus requires an explicit commitment at the highest levels of health care systems. Such a proportional shift in education, attitude and resourcing may be expected to result in widespread benefits, not only in patient satisfaction, but in other outcomes, including the improvement of patient safety with which so many commentators are preoccupied. As shown by Mendoza et al.'s example of physicians' attitude to quality in the United States, the desire of physicians for meaningful relationships with their patients could

emerge as a key enabler for improvement; conversely, the fact that their opinions on the issue have been so little canvassed is likely to be a significant obstacle to positive change. More research is required into creating the conditions for successfully improving doctor-patient relationships as a central element of quality improvement at primary care level.

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