Inpatient Referrals to Consultation-Liaison Psychiatry at a Tertiary Hospital in South Africa

A *Research Report* to meet the requirements

of the *Master of Medicine in Psychiatry* at the

University of Cape Town

by

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September 2016

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DECLARATION

I, *Dr John Ross Torline*, hereby declare that research reported is based on independent work performed by myself and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree to any other university.

I also declare that this work has not been reported or published prior to registration for the degree of the *Master of Medicine in Psychiatry* at the *University of Cape Town*.

Signed by candidate

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ABSTRACT

Introduction. Consultation-liaison psychiatry is the subspeciality that provides for the psychiatric assessment and management of patients in a hospital setting, serving as an interface between psychiatry and other medical disciplines. This study aimed to provide an analysis of the Consultation-liaison psychiatry service at Groote Schuur Hospital. It was hypothesised that the hospital has a large burden of psychiatric illness amongst inpatients with unique characteristics and high rates of referrals related to HIV, alcohol and methamphetamine use.

Methods. A retrospective review was performed of all inpatients referred for psychiatric consultation from other departments over a period of thirteen months. Patients referred by the emergency medical and surgical departments were excluded from this study, as they are seen by the department of *emergency psychiatry*.

Results. A total of 452 patients (males n=174; females n=278) between the ages of 12 and 90 years were consulted, with the majority of the patients (82%, n=360) belonging to the age group of 18 to 59 years (mean age of 37 years). The referral rate to Consultation-liaison psychiatry was 0.95% (when combined with emergency psychiatry referrals the combined referral rate was 4.7%). Most referrals were from the department of medicine (56%, n=252), with the highest number of medical subspeciality referrals from neurology (6%, n=29). Request of a general review (69%) of current psychiatric symptoms (87%) occurred most frequently. The most common symptoms noted by the referring non-psychiatrist were mood symptoms (n=159; 36%), followed by suicidal behaviour (23%, n=102) and behavioural problems (21%, n=94). The mean number of psychiatric diagnoses following assessment was one (SD 1; 0:5), and most patients were assigned a *definitive* diagnosis (78%, n=342). Alcohol use disorder was diagnosed in 9% (n=41). Methamphetamine use was identified in 5% (n=22) of patients, with the majority being diagnosed with methamphetamine abuse. The use of *other* substances was identified in 9% (n=38). The HIV status was confirmed positive in 16% (n=70), with the majority of this group being female (67%). Most subjects had psychosocial and environmental problems (55%, n=249). Registrars performed a mean number of one consultation and the majority of patients were seen within 24 hours of the referral. Medication was initiated in 31% (n=139) of cases. The majority (65%, n=292) of patients were discharged from psychiatric care, and 14% (n=61) required admission to an inpatient psychiatric unit.

Conclusion. The combined referral rate (consultation-liaison and emergency psychiatry) compares favourably to that of high-income countries, and is higher than any other published studies of this nature in low-income and middle-income countries. There was no substantial agreement between psychiatrist and non-psychiatrist diagnoses. As expected, mood disorders were the most common diagnoses, with only fair agreement between psychiatrist and non-psychiatrist clinicians. A high proportion of referred patients were substance users, but methamphetamine rates were lower than expected and the rate of HIV was higher than anticipated. The results presented here may facilitate improvements in the practice of Consultation-liaison psychiatry.

ACKNOWLEDGEMENTS

Foremost I would like to thank my supervisors, Prof J Hoare and Dr K Louw at the Department of Psychiatry and Mental Health, UCT, for providing the original idea and database for the research and for supervision throughout the project. The door to Dr Louw's office was always open whenever I needed support, motivation and guidance. She has been a dedicated and inspirational supervisor. Besides my supervisors, I would like to thank Prof C Adnams at the Department of Psychiatry and Mental Health, UCT, for her support and advice.

I would also like to thank the statisticians who were involved in the project: Henri Carara at the Department of Public Health, UCT, for his input at the early stages of the project, and Ushma Galal at the Department of Statistical Sciences, UCT, for her analysis of the data. Without their participation and input, the project could not have been conducted successfully.

I would also like to acknowledge Ms Charity Oduro, who was the principal data capturer; I am indebted to her for her hours of patient work. My sincere thanks also goes to Dr D Pieterse at the Department of Psychiatry and Mental Health, UCT, for her advice and support.

Finally, I must express my very profound gratitude to my parents, and to my partner Twanji Kalula, for providing me with unfailing support and continuous encouragement throughout my years of study and through the process of researching and writing this report. This accomplishment would not have been possible without them. Thank you.

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ABBREVIATIONS

BPS	Biopsychosocial
CLP	Consultation-liaison psychiatry
DSM	Diagnostic and Statistical Manual of Mental Disorders
DSM IV-TR	Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (2000)
GSH	Groote Schuur Hospital
HIC	High-income country
HIV	Human immunodeficiency virus
ICD	International Classification of Disease
LIC	Low-income country
MA	Methamphetamine
MIC	Middle-income country
MDT	Multidisciplinary team
UK	United Kingdom
UCT	University of Cape Town
USA	United States of America

CHAPTER 1

1. INTRODUCTION

Consultation-liaison psychiatry (CLP), also referred to as liaison psychiatry, psychosomatic medicine or consultative psychiatry, is the subspeciality that provides for the psychiatric assessment and management of patients in a hospital setting and thus serves as the interface between psychiatry and other medical disciplines. CLP finds itself perfectly positioned in an educational role for non-psychiatrists about mental illness. During this process non-psychiatrist may be sensitised to the psychological needs of patients based on personality styles and the treatment of psychiatric disorders.

The CLP physician acts as a liaison between the patient and the referrer; a relationship that mimics the interplay between mental and physical illness. It is well established that there is a bidirectional relationship between mental and physical illness [1–6]. Depression is associated with an increased risk for cardiovascular disease and patients with comorbid cardiovascular disease and depression have an increased morbidity and mortality [1–3]. Diabetes mellitus and depression frequently co-occur, and when they do are associated with poorer diabetic control and adverse diabetic outcomes [4]. People with serious mental illness have shorter lifespans due to an increased prevalence of physical illness [5,6]. Given this relationship the co-management of psychiatric and medical illness by physicians and CLP services cannot be overstated.

The theoretical foundations for CLP were set in the 1940s; however, it was only formally recognised as a subspeciality by the American Psychiatric Association in 2003 [7]. The availability of CLP resources appears to vary greatly from country to country, with the lowest rates of utilisation of services likely to occur in low-income countries (LICs) and

middle-income countries (MICs)*. CLP is currently in the process of receiving approval as a subspecialty by the Health Professions Counsel of South Africa. Appendix A describes the evolution and scope of CLP in more detail.

Patients are referred to the consultation-liaison psychiatrist at the request of the principal care team for a wide range of concerns about a patient's mental state and in what way this may impact on their treatment. An integral part of CLP involves contact with the treating team and family members [8]. The therapeutic component of CLP care is usually brief, with most patients being referred to other professionals following their discharge from hospital.

Previous research examining the medical illness-psychiatry interface have resulted in the development of practice guidelines and priorities in teaching [9]. Studies have shown a higher prevalence of mental illness among people with medical illness, and that psychiatric disorders occur commonly in hospitalised patients [5,6]. Psychiatric conditions often remain undiagnosed and untreated in these patients, leading to higher morbidity and mortality and higher health-care costs [12,13]. Assessments of CLP services in general hospitals have led to strategies that have reduced the utilisation and costs of medical care [14].

There has been an increasing strain on the South African public health-care system as it attempts to accommodate the growing medical demands of the country's diverse population [15]. Mental disorders have been identified as the third highest contributor to the burden of disease in South Africa [16]. The lifetime prevalence of any mental disorder in South Africa is 30.3%, with the highest prevalence being in the Western Cape [17].

*__World Bank income groups:__ Member states of the World Health Organization are clustered into income groups based on the classification of their economies based on gross national income for the fiscal year. [18]. South Africa has been classified as an (upper) MIC by the World Bank [19].

Despite the high prevalence of mental illness and the ever-increasing demand on hospital services, research on CLP services in the South African context has been limited.

Groote Schuur Hospital (GSH) serves as the principal teaching hospital for the University of Cape Town (UCT), and the established department of psychiatry provides multi-level care for patients from the Western Cape and beyond. At the time of this project, no prior analysis of this service at GSH had been performed. The socio-demographic characteristics of the referred patients and the pattern of psychiatric morbidity encountered by this CLP service were undetermined. A comparison of this particular South African CLP service to that of other sites also was not undertaken.

2. LITERATURE REVIEW

2.1 Objective of the Literature Review

Published articles on referrals to consultation-liaison psychiatry (CLP) date back to the 1960s [12]. The broad objective of this literature review was to identify available articles relevant to this research project.

2.2 Literature Search Strategy

This study did not include a systematic literature review; however, a structured method was applied in exploring and evaluating the literature. Multiple online databases, including EBSCO Host (Africa-Wide Information, CINAHL, Health Source - Consumer Edition, PsycARTICLES, PsycINFO), Scopus, Web of Science, African Index Medicus and PubMed, were explored with standard electronic search strategies using the following terms: “liaison OR consultation-liaison OR CLP OR psychosomatic OR psychosomatic medicine AND referral OR refer OR referrals OR second opinion OR psychiatric referral AND inpatient OR in-patient OR admitted OR consultation OR hospital patient OR hospitalised OR hospitalized”. Relevant articles were identified once their abstracts had been reviewed. Some articles were discovered by reviewing the references of original articles. Books and articles published in languages other than English and studies conducted on paediatric populations were excluded. The details of the literature search are outlined in Appendixes B and C.

2.3 General Inpatient Consultation Liaison Research

The growing body of research examining the socio-demographic data and intervention patterns of inpatient CLP referrals over the past three decades has varied considerably in its setting and methodology, and in the number of cases reviewed. Over time, researchers have relied on the use of several versions of different diagnostic systems, such as the International Classification of Disease (ICD) and the Diagnostic and Statistical Manual of Mental Disorders (DSM). Diverse sites, including general and teaching hospitals that operate within a variety of privately, publicly and government-funded models have been studied.

2.4 Number, Rate and Timing of Referrals

The number of referrals to CLP services varies significantly. Daily referral rates to CLP are generally not calculated, but were estimated by the authors of this project to be around an average of 1.6 per day (49 per month) in MICs. See Table 3.1 in Appendix D for the results of these calculations and the studies included.

The rate of referral to CLP services varies considerably [13]. A number of local and systemic factors have been suggested as causes of these differences [14,15]. Studies comparing well-resourced countries with MICs have shown variations in referral rates and have suggested reasons such as stigma and the availability of resources as the cause [16]. Referral rates may vary during certain times of the year, which is thought to be due to the availability of health insurance funds at the time of admission [17,18]. Some researchers have suggested that the rate of referral to CLP is an indicator of the sensitivity and proficiency of hospital physicians regarding mental illness [19].

There is an association between the time to initial psychiatric consultation and the length of stay [20,21]. The type of psychiatric disorder has been shown to be a predictor of early or later referral [5]. High social vulnerability is associated with later referral [22]. Younger patients and patients admitted to medical units have been shown to be more likely to be referred to CLP sooner [23].

2.5 Demographic Profile

The socio-demographic profile of patients referred to CLP services varies. Studies have shown that the most likely gender to be referred is female and that different psychiatric presentations occur in certain ethnic groups [24]. Age has also been shown to be associated with different psychiatric morbidity [25].

2.6 Referral Source and Reason for Referral

Patients are referred to CLP from a variety of medical and surgical specialities. Patients are most commonly referred from medical specialities, and some studies have shown relatively few referrals from surgical disciplines [26]. Reasons for referral to CLP vary widely. Patients are referred for the assessment of past and current psychiatric symptoms, the assessment of aetiology of symptoms and assistance with psychiatric intervention [23]. Unexplained somatic symptoms and psychiatric disorders presenting with physical symptoms are frequent reasons for referral [27].

2.7 Diagnostic and Treatment Trends

Research regarding diagnostic trends has occurred mostly in countries with highly developed medical services and there is a scarcity of this type of research in MICs. Data regarding the number of psychiatric diagnoses per referral varies. Depending on the diagnostic system used, studies have shown an overall rate of at least one psychiatric diagnosis being made in 70 to 90% of cases [18,28].

The most common psychiatric diagnoses made by CLP are mood, anxiety, cognitive and substance-use disorders. Depression is often the most common psychiatric diagnosis in the referred patients [18,29–31]. Judd et al. showed an overall concordance rate of 79% between the identification of depression by the referring non-psychiatrist and by liaison psychiatrists [32]. The presence of psychotic disorders varies between 1.9% and 58% [21,33].

Studies have calculated that approximately 40% of CLP diagnoses were "differential" [34,35]. Some have shown stability in certain diagnoses, while others have shown changes in the frequency of diagnoses [36]. These changes in the diagnosis rates of conditions have been attributed to the reclassification of disorders in newer versions of the DSM or ICD diagnostic systems [18].

Research has shown that many CLP services employ interventions that are not based on high-quality evidence, and some have suggested the implementation of protocols to improve CLP services [37,38]. Strategies for improvement vary and have included the development of the relationship between physicians and psychiatrists, changes in the timing of referrals and a greater availability of skilled CLP services [21,39,40].

An understanding of the structure, processes and outcomes of CLP services has been shown to improve clinical performance [41,42]. The organisation of CLP services is an

important factor influencing the outcomes of referred patients [43]. Despite authors suggesting that CLP is essential in less-resourced settings, only limited studies regarding referrals to CLP have been conducted in African countries [44].

2.8 Research in Low- and Middle-Income Countries

CLP research has been scanty outside of the Occident, particularly in middle- and low-income countries. Table 1.1 shows studies examining inpatient referrals to consultation-liaison psychiatry in low- and middle-income countries between 1983 and 2016. Most of these studies were conducted in Asia and Africa.

2.8.1 Consultation Liaison Research in Asia

Malhotra and Malhotra reviewed CLP referrals at a general teaching hospital in India over a period of one year (1978/1979) with the aim of comparing the service to those in the Occident [28]. The authors concluded that Indian referral rates were comparable to British rates, but low when compared to the USA. Mahar et al. studied the frequency of psychiatric disorders in the admitted patients at a hospital in Karachi, Pakistan in 2007 [45]. The most common diagnosis in this study was depression and the rate of organic brain disease was lower than expected. The authors suggested further research into CLP and efforts to improve the relationship between CLP and other clinicians to improve patient care.

Table 1.1. Studies Examining Inpatient Referrals to Consultation-Liaison Psychiatry in Low- and Middle-Income Countries (1983–2016)

Author, Publication date	Year studied	Duration	Type of hospital	Country	n
Tema & Janse Van Rensburg, 2015 [46]	2009	6 months	Teaching	South Africa	884
Keertish et al., 2013 [27]	2011–2012	2 years	Teaching	India	520
Risal & Sharma, 2013 [17]	2010-2011	1 year	Teaching	Nepal	385
Arbabi et al., 2012 [18]	2007	1 year	Teaching	Iran	503
Gibson et al., 2010 [19]	2006-2007	1 year	Teaching	Jamaica	201
Mahar et al., 2010 [45]	2007	6 months	Military	India	427
Singh et al., 2008 [47]	2009	7 months	Teaching	Nepal	484
Özkan et al., 2006 [48]	1998 and 2002	2 years	Teaching	Turkey	2497
Makanyengo et al., 2005 [49]	2002	1 year	Teaching	Kenya	332
Ajiboye & Adelekan, 2004 [50]	2001	6 months	Teaching	Nigeria	47
Aghanwa, 2002 [51]	1999-2000	18 months	General	Fiji	164
Aghanwa et al., 1996 [52]	1987-1992	5 years	Teaching	Nigeria	87
Özkan, 1995 [53]	1989-1991	3 years	Teaching	Turkey	889
Paholpak, 1991 [54]	Unknown*	2 years	Teaching	Thailand	271
Gangat et al., 1987 [40]	1985	6 months	Teaching	South Africa	597
Malhotra & Malhotra, 1984 [28]	1978-1979	1 year	Teaching	India	336

* Full article was not available

Given the limited number of CLP studies done in India, Keertish et al. conducted a descriptive, cross-sectional study at a tertiary care teaching hospital in South India over a period of two years (2011 and 2012) [27]. The referral rate of 0.42% was less than that of Malhotra and Malhotra's study (1.48%) [29], despite the three decades between these studies. In contrast to other studies outside of India, the proportion of referred patients in the age group of older than 65 years was fairly low. The authors suggested a number of explanations for this finding, such as lower life expectancy, less knowledge about

neurogeriatric illness, family neglect, acceptance of geriatric illness as normal, and a preference for alternative medical systems.

Singh et al. reviewed all consecutive cases referred from different outpatient and inpatient departments at Nepal Medical College and Teaching Hospital over a six-month period in 2008 [47]. The authors calculated that the overall rate of referral was 1.4% and that depressive, anxiety and substance-use disorders were the common diagnoses. A similar study was conducted at a tertiary care university teaching hospital in Nepal over a one-year period by Risal and Sharma in 2013 [17]. The overall referral rate was 3.87%, with a peak occurring in the summer months, which was associated with an increase in intentional poisoning. This was an unusual finding for which the authors offered no explanation. Alcohol-related disorders were diagnosed in 23% of cases and, interestingly, personality disorder was identified in 17%, with emotionally unstable (impulsive) or mixed-type recognised as the most common diagnosis.

Özkan et al. evaluated the clinical activities of the CLP Unit of the Istanbul Faculty of Medicine (1989 to 1991) and intriguingly discovered a high rate of referral (17%) from dermatology [55]. In addition, the rate of referral increased over the research period, which was attributed to a number of factors specifically designed to improve the CLP service. A second Turkish study by Özkan et al. at the same hospital in 2006 aimed to compare the CLP service, since major changes in the characteristics and organisation had been implemented following the previous study [48]. This comparative study found that the consultation rate nearly doubled, that, over time, more men were referred than women, and that the percentage of older patients referred increased. These changes were attributed to strategies implemented to affect service delivery, a change in the composition of the CLP team and educational programmes for non-psychiatric physicians.

In 2007, Arbabi et al. analysed the data from 503 CLP consultations at hospitals affiliated with the Tehran University of Medical Sciences [18]. The authors commented on the challenges in making statistical comparisons with previous research due to methodological differences between the studies and diagnostic inconsistency resulting from the use of different diagnostic systems, such as ICD and DSM.

In contrast to the above Asian studies, Wong et al. identified the most common reason for referral to be "unstable emotion", followed by suicidality, in their 2012 analysis of CLP referrals at a general hospital in Hong Kong [56]. This may be due to the different socio-demographics of the sample, as Hong Kong is classified as a HIC.

2.8.2 Consultation Liaison Research in Africa

There is not much published data on CLP services in Africa. Aghanwa et al. reviewed CLP referral data collected over a five-year period (1987-1992) at a number of teaching hospitals in Nigeria [52]. The study showed a lower referral rate to CLP compared to that in Britain and the USA. A similar study was conducted by Ajiboye and Adelekan at a Nigerian teaching hospital in 2001 [50]. While the number of referrals during the six-month study period was low (n=47), the authors identified areas where training and management could be improved. Makanyengo et al. conducted a retrospective study of CLP referrals at Kenyatta National Hospital in Kenya in 2002 and suggested improvements in alcohol and HIV services [49].

2.9 South African Context

Since South Africa's process of democratisation started in 1994, there has been increasing pressure on the public health-care system as it endeavours to accommodate the mounting medical requirements of the populace [9]. The diverse population, of nearly 55 million people, has a total of 65 762 medical practitioners, with only 841 being psychiatrists, and mental disorders are common [10, 11].

Despite the high prevalence of mental illness and the ever-increasing demand on hospital services, South African CLP research is limited. In 1985, Gangat et al. collected data from 259 consecutive inpatient referrals to CLP during a six-month period at Addington Hospital in Durban [40]. A referral rate of 1,8% was calculated, which the authors considered relatively low given the known prevalence of mental illness, and they suggested that additional and better-trained staff was required. Patterns and reasons for referral were generally in keeping with those of the existing international literature, with the most frequent referrals coming from medical specialties.

In 2009, data was collected from routine and emergency consultations over a six-month period at Helen Joseph Hospital in Johannesburg, and mental status assessment was identified as the most frequent reason for referral [46]. The authors highlighted the need for the development of guidelines to improve the CLP service. Interestingly, when ranked according to the highest number of referrals per day in studies conducted in MICs, South Africa has the highest number of daily referrals (see Table 3.1, Appendix D).

2.10 Groote Schuur Hospital

Officially opened in 1938, Groote Schuur Hospital (GSH) is a large, government-funded academic referral centre in Cape Town providing secondary, tertiary and quaternary care for patients of the Western Cape and other parts of the country. It is well known for being the institution where the first human heart transplant was performed in 1967. It serves as the principal teaching hospital for the University of Cape Town's Faculty of Health Sciences and has 970 beds for inpatients [57].

The GSH department of psychiatry maintains an active CLP service, which was initiated in 2006. The team consists of two consultant psychiatrists and two rotating psychiatry registrars, who work in conjunction with a multidisciplinary team (MDT) consisting of psychologists and social workers. One registrar is allocated to patients who are human immunodeficiency virus (HIV) positive (as part of the Neuropsychiatry Service), while the other registrar reviews referred patients who are not known to be HIV positive. For operational reasons, and unlike certain hospitals, a separate service called the "Emergency Psychiatry Unit" responds to referrals from the trauma and medical emergencies departments.

The CLP MDT attends predominantly to inpatient referrals from other specialties. Some members of the team also offer a range of outpatient clinics, such as HIV/Neuropsychiatry, Maternal Mental Health, Pain, Eating Disorders and Adolescent services.

Over the last few years there has been a perceived increase in demand placed on Groote Schuur Hospital's CLP service. Despite this, very little is known about the composition of the referrals. The reason for referrals remains unknown and the most common types of psychiatric disorders encountered by the service have not been analysed.

Resources are limited, and thus management and training implementations to improve the service should be attempted once the service is better understood.

2.11 Methamphetamine and Alcohol Use

Methamphetamine (MA) has been identified as a key driver of substance abuse and psychiatric treatment in the Western Cape, with 35% of those in treatment in the province reporting it as their drug of choice [58]. Plüddemann et al. analysed the socio-demographic profile of MA-related admissions to the emergency psychiatry ward at GSH in 2008 and determined that MA-induced psychotic disorder was a common presentation [59].

Alcohol abuse is a major public health concern in South Africa, with alcohol consumption levels amongst the highest in the world [60]. Alcohol use has been identified as a significant factor in MICs such as India [17]. Keertish et al. identified substance use as the reason for referral in 11.3% of cases a tertiary care teaching hospital in south India [27]. Risal and Sharma identified alcoholic liver disease as the medical diagnosis in 13% of referred patients and identified alcohol withdrawal as the second most common (28%) psychiatric diagnosis [17].

Gangat et al. reported that problems related to alcohol abuse were identified in 7% of referrals at Addington Hospital in Durban and that about 5% were related to other substances [40]. Findings about HIV or MA use were not reported because, at the time of the study, the HIV prevalence was relatively low and MA abuse only emerged as a problem in 2002 [59,61].

2.12 HIV and Consultation-Liaison Psychiatry

South Africa has a unique and diverse population, with a larger number of people living with human immunodeficiency virus (HIV) than in any other country [62]. With the strong association between HIV and psychiatric illness, the role of the contemporary (South African) psychiatrist in this area cannot be overestimated. To date, very little data on the role of HIV in CLP has been produced in South Africa. Tema and Janse van Rensburg identified HIV as the most common aetiological factor (67%) in patients with underlying medical conditions at Helen Joseph Hospital in Johannesburg [46].

Given the above, it was hypothesised that Groote Schuur Hospital has a large burden of psychiatric illness amongst its inpatients, who have unique characteristics, and that significant amounts of these referrals would be related to HIV, and alcohol and methamphetamine abuse.

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CHAPTER 2: PUBLICATION-READY MANUSCRIPT

Format as per APPENDIX E – Guide for Authors – General Hospital Psychiatry

TITLE PAGE

Inpatient Referrals to Consultation-Liaison Psychiatry at a Tertiary Hospital in South Africa

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Running Title:

Inpatient Referrals to CLP at a South African Hospital

Article Data:

Number of tables: 1

Word length *Article:* 3471

Abstract: *176*

ABSTRACT

Objective. This study aimed to provide an analysis the Consultation-liaison psychiatry service at a tertiary hospital in South Africa. A large burden of psychiatric illness and high rates of referrals related to HIV, alcohol and methamphetamine abuse were expected.

Methods. A retrospective review of referrals over a thirteen-month period was performed. Referrals to the emergency departments were excluded from the main analysis.

Results. The sample included 452 patients. The referral rate to Consultation-liaison psychiatry was 0.95%, and the combined referral rate (including emergency referrals) was 4.73%. Most referrals were from the department of medicine, with a general review of current psychiatric symptoms being the most frequent request. Alcohol-use disorder was diagnosed in 9%, methamphetamine use was identified in 5% and the HIV status was confirmed positive in 16%.

Conclusion. The referral rate compares favourably to that of other countries. A high proportion of patients were substance users, but methamphetamine rates were lower than expected and the rate of HIV was higher than anticipated. The results presented here may facilitate improvements in the practice of Consultation-liaison psychiatry.

KEYWORDS: consultation-liaison psychiatry, psychosomatic medicine, psychiatric referral

ARTICLE

1. Introduction

Consultation-liaison psychiatry (CLP) is the subspeciality that provides the psychiatric assessment and management of patients in a hospital setting. It serves as the interface between psychiatry and other medical disciplines where it is perfectly positioned in an educational role for non-psychiatrists. Research has shown a higher prevalence of mental illness among people with physical health problems than in the rest of the population [1]. The presence of psychiatric disorders has been shown to occur in as many as two-thirds of hospitalised patients [2]. However, psychiatric problems often remain undiagnosed and untreated in admitted patients, leading to a further rise in morbidity and mortality and a subsequent increase in the cost of health care [3,4]. The availability of CLP resources appears to vary greatly from country to country, with the lowest rates of utilisation of services likely to occur in low- and middle-income countries (LICs and MICs).

Over the past several decades, a global database of CLP literature has been accumulating, which in turn has informed the development of practice guidelines and priorities in teaching [5]. Assessments of CLP services in general hospitals have led to strategies that have reduced the utilisation and costs of medical care [6].

Since South Africa's process of democratisation started in the 1990s, there has been increasing strain on the public health-care system as it attempts to accommodate the growing medical demands of the country's population [7]. Mental disorders have been identified as being the third highest contributor to the burden of disease in South Africa [8]. The lifetime prevalence for any mental disorder in

South Africa is 30%, with the highest prevalence being in the Western Cape [9]. The diverse population of nearly 52 million people is served by a total of 65 762 medical practitioners, of whom only 841 are psychiatrists [10,11]. Despite the high prevalence of mental illness and the ever-increasing demand on hospital services, South African CLP research is limited.

South Africa has a greater number of people living with human immunodeficiency virus (HIV) than any other country [12]. With the strong association between HIV and psychiatric illness, the role of the contemporary (South African) psychiatrist in this area cannot be overestimated. In addition, methamphetamine (MA) has been identified as a key driver of substance abuse and psychiatric treatment, particularly in the Western Cape [13]. Despite this, there is only meagre research exploring the prevalence of HIV and methamphetamine use in CLP. As a result, there is a need to undertake CLP research in a South African setting, which may inform the future development of treatment protocols, the planning of services and training requirements related to these issues.

2. Materials and Methods

2.1. Research Design

This study was a retrospective, descriptive, cross-sectional review of all patients consecutively referred to the Groote Schuur Hospital (GSH) CLP service over a thirteen-month period (August 2011 to July 2012).

2.2. Study Setting

GSH is a large, government-funded academic hospital in Cape Town, providing multi-level care for patients from the Western Cape province, South Africa. It serves as the principal teaching hospital for the University of Cape Town's (UCT) Faculty of Health Sciences and has 970 beds for inpatients [14]. The GSH department of psychiatry maintains an active CLP service, which was initiated in 2006. The team consists of two consultant psychiatrists and two rotating psychiatry registrars who work in conjunction with a multidisciplinary team (MDT). One registrar is allocated to patients who have tested positive for human immunodeficiency virus (HIV), while the other registrar reviews referred patients who are not known to be HIV positive. Assessment typically involves reading the case notes, interacting with other health-care professionals involved in the case and interviewing the patient. Collateral information may be obtained from a family member or other persons. Cases are discussed with the multidisciplinary team at a weekly meeting and are assessed by other team members when necessary.

2.3. Sampling and Materials

During office hours, the CLP service receives referral slips in a centralised location from other specialties attending to inpatients. After-hours referrals are usually done telephonically, but are recorded in a diary by the doctor receiving the referral. For operational reasons, a separate service called the *emergency psychiatry unit* responds to referrals from the emergency departments, and these patients were not included in our data. A specifically devised, structured pro forma is used for data collection, which includes the following variables: demographic information, source of referral, reason and date of referral, psychiatric diagnosis, review dates,

intervention, outcome and follow-up plan. Diagnosis is based on the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM IV-TR), using the multiaxial system for assessment. Ethical approval for the project was obtained from the Human Research Ethics Committee of the Faculty of Health Sciences at UCT.

2.4. Statistical Analysis

Data was entered into an electronic spreadsheet for analysis using the statistical package SPSS Version 21. The agreement between non-psychiatrist and psychiatrist diagnoses was analysed by calculating Cohen's Kappa coefficient.

3. Results

A total of 452 patients were referred to the CLP service from August 2011 to September 2012, which represented a referral rate of 0.95% for the period. Referral rates were stable over the months studied, with an average of 1.1 referrals per day. The mean time lag between referral and assessment was under 24 hours (0.9 days). The distribution of total registrar and consultant reviews was shown to be the same across gender, referring department, substance abusers and HIV status, with a single registrar consultation as the mean (SD 1).

3.1. Demographic Details

Of the inpatient CLP referrals, 38% (n=174) were male and 62% (n=278) were female, representing a female to male ratio of 1:0.6. The majority of the patients (80%, n=360) belonged to the age group 18 to 59 years, and the mean age of the study population was 37 years (SD 16).

3.2. Sources of Referral

Of the referrals, 56% (n=252) were from the department of medicine, 25% (n=113) from surgical departments, 13% (n=61) from the department of obstetrics and gynaecology, 4% (n=19) from the department of paediatrics and 3% (n=12) from other departments. Referrals from the department of medicine were subdivided into general internal medicine (32%, n=145) and medical specialties (24%, n=107). The majority of referrals from a specialist medical department were from neurology (n=29), intensive care units (n=23), oncology (n=14) and dermatology (n=10). Referrals from the department of surgery were mostly from surgical specialties (n=76), with 26% (n=29) of all referrals from surgery requested by orthopaedics. Referrals from obstetrics comprised 85% of the referrals from obstetrics and gynaecology.

3.3. Reasons for Referral

A number of reasons for referral were identified, and they were often multiple for each patient. An analysis of the reasons for referral follows: (1) opinion on current psychiatric symptoms (86%); (2) general review of mental state (69%); (3) opinion regarding the aetiology of symptoms (33%); (4) request for psychiatric intervention (17%); and (5) review of a patient with a previous psychiatric history (15%). The most common symptoms noted by the referrer were mood symptoms (36%), followed by suicidal behaviour (23%), behavioural problems (21%) and symptoms of psychosis/ schizophrenia (16%). Substance-related symptoms were noted in only 5% of referrals. A single referral mentioned concerns about a personality disorder, and there were no referrals citing symptoms of factitious,

gender identity or dissociative disorders.

3.4. Psychiatric Diagnoses

The mean number of psychiatrist diagnoses following CLP assessment was one (SD 1; 0:5). The majority of patients had a definitive psychiatric diagnosis (78%) following assessment. At the time of referral, 37% (n=166) of patients had *no psychiatric diagnosis* and, following CLP assessment, 18% (n=80) of the patients had no psychiatric diagnosis. As can be seen from Table 2.1, the most commonly diagnosed disorders following CLP assessment were mood disorders (31%, n=134), followed by substance-use disorders (20%, n=89), delirium (16%, n=71), schizophrenia/psychotic disorders (14%, n=62), personality disorders (11%, n=48) and adjustment disorders (10%, n=45). Intellectual disability was diagnosed by psychiatrists in 3% (n=12) of cases, while none of the non-psychiatrists identified this in their referral. Table 2.1 also highlights the concordance between the reason for referral, or "non-psychiatrist diagnosis", and the psychiatric diagnosis. There was no substantial or perfect agreement between psychiatrist and non-psychiatrist diagnosis. Moderate agreement (kappa 0.41 to 0.60) was seen in psychotic disorders/schizophrenia, substance-use disorders and somatoform disorders.

3.5. Substance-use Disorders

Following psychiatric assessment, 21% (n=95) of patients were diagnosed with a substance-related disorder. Alcohol-use disorder was diagnosed in 9% (n=41) of patients, with male patients slightly more likely to have an alcohol-use disorder than females (54% vs. 46%). The mean age of pathological alcohol users was 42 years. Alcohol-use disorder was seen in 11% (n=36) and 10% (n=4) of the age groupings of

18 to 59 and 60+ respectively. MA use was identified in 5% (n=22) of referred patients, with the majority (82%; n=18) meeting the criteria for MA abuse, and there were more male than female MA users (59% vs. 41%; p = 0.045). The mean age of pathological MA users was 28 years, and 95% (n=21) of these patients were in the age group 18 to 59 years. The use of *other* substances was identified in 8% (n=38) of the sample.

3.6. Medical Comorbidity and HIV Status

Infectious diseases were present in 19% (n=84) of the sample. Following this, the most common co-morbid diagnoses were: cardiovascular disease (13%; n=58); overdose/poisoning/toxicity (12%; n=52); obstetric/gynaecological illness (11%; n=51); and neurological disease (11%; n=49). Endocrine disorders comprised 10% (n=45), with diabetes mellitus comprising two thirds of these referrals. Surgical illness was represented as: thoracic/abdominal surgical disease, 6% (n=28); orthopaedic problem, 6% (n=27); and neurosurgical disease, 5% (n=21). The majority of patients were presumed or known to be HIV negative (84%; n=377 and 1%; n=4), while 16% (n=70) were known to be HIV positive. In the HIV-positive group, 67% (n=47) were female and the majority (n=64) were in the 18 to 59 age group. The mean age of the sample was 33 years (9:61; SD 10).

3.7. Psychosocial and Environmental Stressors

A total of 55% (n=249) subjects had psychosocial and environmental problems affecting the diagnosis, treatment and prognosis of medical and psychiatric disorders.

3.8. Treatment Plan Following the Psychiatric Assessment

Medication was initiated in 31% (n=139) of patients reviewed, and medication adjustments were recommended in 19% (n=87). A staff intervention, such as facilitating good relationships between the treating teams and their patients, was initiated in 11% of cases (n=48). Referrals to counsellors, psychologists and social workers were recommended in 19% (n=87), 9% (n=42) and 8% (n=38) of referrals respectively.

3.9. Outcome Following the Psychiatric Assessment

The majority of patients seen were discharged from psychiatric care following review (65%; n=292). Admission to an inpatient psychiatric unit occurred in 13% (n=61) of patients, of which the majority were to the emergency psychiatry unit (9%; n=40). Death occurred in 2% (n=9).

3.10. Follow-up Plan After the Psychiatric Assessment

Of those patients who required outpatient psychiatric follow up, the majority (23%; n=103) were referred to community mental (primary) health clinics. The remaining patients were referred to tertiary adult psychiatric services (12%), outpatient psychology services (3%) and to child and adolescent services (1%).

4. Discussion

This study aimed to compare the GSH CLP service to that in the literature, particularly in LICs and MICs, and to quantify referrals that were related to HIV, alcohol and MA. It was hypothesised that GSH has a large burden of psychiatric

illness amongst its inpatients, who have unique characteristics, and higher than usual referrals related to HIV, alcohol and MA. When compared to the literature, the findings of our study show certain similarities and differences. Referral rates range between 3% and 4% in HICs [15,16] and from 0.4 to 1.8% in LICs and MICs [17–21]. The referral rate of 0.95% to this specific CLP service should be interpreted with caution due to the operational separation of the psychiatry service at GSH. During the study period, an additional 1 790 patients were referred to the emergency psychiatry department. When both emergency and CLP referrals were pooled, a combined referral rate of 4.7% was calculated. Interestingly, this combined referral rate was higher than the 1.8% reported by Gangat et al. in Durban in 1985 [20]. This may be due to local factors, or to changes in attitudes since the 1980s. Lower referral rates to CLP have been suggested to result from stigma towards patients with psychiatric co-morbidity [17]. Our referral rate may indicate lower levels of stigma at GSH, or may be an indicator of the sensitivity and proficiency of hospital physicians regarding mental illness. Daily referral rates to CLP are generally not calculated, but have been estimated by us to be around an average of 1.6 per day (49 per month) in MIC settings. We calculated an average of 1.1 referrals per day to the CLP service, and the combined daily referral rate was 5.7 patients per day. This is the highest referral rate calculated in studies of this nature in LICs and MICs [16–19,21–31]. In the context of the prevalence of mental illness in the Western Cape, this result is not surprising. It may also indicate a high awareness of mental illness amongst physicians and/or perceived inability by the referrer to manage psychosocial problems.

The mean time to review of 0.9 days is promising, given that the timing of referral has been shown to be important in terms of length of stay in hospital. Ormont et al. showed that earlier CLP consultations were associated with a shorter time to discharge [2]. A limitation of this study was that the length of stay was not calculated. De Jonge et al. concluded that the timing of referral is a critical factor for the efficacy of a CLP intervention, and that the socially vulnerable in particular may benefit from early CLP referral [32]. This factor is particularly important in the context of the population which GSH serves.

This study reflects the patterns in a teaching hospital that provides multiple levels of care to a delineated catchment area. It therefore is not truly representative of the general South African hospital setting; however, the data is important as there is only limited research on South African CLP services. The female to male ratio of 1:0.6 is consistent with other studies, which have shown that the most likely gender to be referred is females [33]. The mean age (37) did not vary considerably from other studies. The majority of patients were referred for a review of their current psychiatric symptoms, suggesting that the referrers were comfortable managing stable psychiatric complaints or simply unaware of these conditions being present in their patients. In our study, the most common symptoms identified by the referrer were mood symptoms (36%), suicidal behaviour (23%) and behavioural problems (21%). This is consistent with the majority of other research, which shows that depression is often the most common psychiatric diagnosis in referred CLP patients [24,34–36]. Due to the separation of psychiatric services at GSH, the data included fewer referrals that typically result from attempted suicide or self-injurious behaviour, and for acute mania or psychosis.

Delirium was the reason for referral in 4% of non-psychiatrist referrals and was diagnosed in 16% of cases following CLP assessment. Research in similar settings such as India has shown higher rates of delirium (34% of all referred cases) [37]. These lower rates of referral may indicate that the clinicians at GSH are confident in treating delirium, are unable to identify symptoms of delirium, or refer patients with symptoms of delirium and attribute them to other disorders, such as “psychosis”.

There was no *substantial* or *perfect* agreement between psychiatrist and non-psychiatrist diagnosis, although *moderate* agreement was seen in psychotic disorders/schizophrenia, substance-use disorders and somatoform disorders. Surprisingly, there was only *fair* agreement regarding the diagnosis of mood disorders, which may be due to the combination of bipolar and depressive disorders in the data collection and analysis. In general, this inter-observer variation was not surprising, as the degree of agreement between the referring doctor and the C-L psychiatrist for these disorders is in keeping with other research [38].

Research examining diagnostic characteristics over time has shown various trends. Studies have shown that the overall rate of at least one psychiatric diagnosis being made is as high as 90% [24]. We found that 18% of our patients received no psychiatric diagnosis. This figure may represent patients referred to CLP for assistance with non-psychiatric problems, as indicated by the sizeable number of subjects with psychosocial and environmental problems (55%). However, despite this number, relatively few patients were referred to support services such as counsellors (19%), psychologists (9%) and social workers (9%). This is likely due to the limited number of these professionals being available at GSH, and presumed

difficulties in patients attending follow-up sessions.

Studies have calculated that approximately 40% of diagnoses are "differential" [39,40]. Our study found that only 16% were assigned a differential diagnosis, and 78% of subjects were given a definitive psychiatric diagnosis. This may represent the diagnostic conventions of the CLP team, or the clear diagnostic certainty of the referred cases.

Consistent with the literature, we found that the majority of the referrals were from the department of medicine (56%). The highest number of referrals from a specialist medical department were from neurology (27%). This is encouraging, as previous research has shown that psychiatric illness is prevalent amongst neurology inpatients, yet referral rates to CLP are low [41]. Other significant sources of referral were special surgery (17%) and obstetrics and gynaecology (13%).

We identified a high rate (21%) of substance use in the sample. When the data was explored, it was shown that 9% of patients had an alcohol-use disorder, 5% used MA and 9% used other substances. Alcohol abuse is a major public health concern in South Africa, with alcohol consumption levels amongst the highest in the world [42]. Gangat et al. reported that problems related to alcohol abuse were identified in 7% of referrals, with about 5% related to other substances in a tertiary hospital in Durban [20]. These results are similar to findings in other MICs such as India [22]. MA has been identified as a key driver of and psychiatric treatment in the Western Cape, with 35% of those in treatment in the Western Cape this province reporting it as their drug of choice [13]. Surprisingly, MA rates were lower than expected. As MA-induced psychotic disorder is a common presentation in the

Western Cape, these patients were more likely to have presented to the emergency psychiatry service [43].

Surveys have estimated that the national prevalence of HIV amongst South Africans is 12%, with the lowest rate (5%) being in the Western Cape [44]. When the data regarding HIV was analysed, it was shown that 16% of referrals were known to be HIV positive. This represents a relatively high rate given the provincial prevalence. With the strong association between HIV and psychiatric illness, the role of the contemporary (South African) psychiatrist in this area should not be underestimated.

5. Conclusion

The findings should be viewed with the limitations of the study in mind – a retrospective design, information captured on data collection sheet, no direct face-to-face interviews, various levels of clinical expertise attending to referrals over the study period and diagnosis not being made with standardised scales. The combined referral rate during the study period compares favourably to HICs [1,2,3]. The calculated combined daily referral rate is higher than any other published studies of this nature in LICs and MICs [16,17,19,21,23–25,27–31,45,47,48]. There was no substantial agreement between psychiatrist and non-psychiatrist diagnoses. As expected, mood disorders were the most common diagnosis, with only fair agreement between psychiatrist and non-psychiatrist clinicians. An unexpected high rate of HIV was observed. Although a large proportion of referrals were substance users, methamphetamine rates were lower than expected.

This study provides a better understanding of the CLP service at GSH, as well as important information for the general management of the CLP service. Disseminating the findings of this study may emphasise the importance of CLP as a specialty and improve CLP training programs. Research has shown that many CLP services employ interventions that are not based on high-quality evidence [49]. Despite various authors suggesting that CLP is essential in settings with low levels of resources, only limited studies have been conducted in African countries on referrals to CLP [50]. An understanding of the structure, processes and outcomes of CLP services has been shown to improve clinical performance and provide information for protocols to improve CLP services [36,37,38]. The organisation of CLP services has also been shown to be an important factor influencing the outcomes of referred patients [51–53]. Psychiatry training programs in Africa should be based on the requirements of the population. Given the setting, CLP services should be tailored to best utilise limited resources which may include the use of screening tools and proactive case management.

ACKNOWLEDGEMENTS

- Prof J Hoare and Dr K Louw at the Department of Psychiatry and Mental Health, UCT, for providing the original idea and database for the research and for supervision throughout the project.
- Prof C Adnams at the Department of Psychiatry and Mental Health, UCT, for her support and advice.
- Henri Carara at the Department of Public Health, UCT, for his input in the early stages of the project.
- Ushma Galal at the Department of Statistical Sciences, UCT, for her analysis of the data.
- Ms Charity Oduro, who was the principal data capturer.

DISCLOSURES

1. Dr Kerry Louw - none
2. Prof Jacqueline Hoare - none
3. Dr John Ross Torline - none

FUNDING

Funding was received from the University of Cape Town.

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TABLE

Table 2.1. Non-psychiatrist and Psychiatrist Diagnosis				
Psychiatric diagnosis	**Non-psychiatrist**	**Psychiatrist**	**Agreement**	
			P-value	**Kappa score**
Mood disorder	35% (n=154)	31% (n=134)	< 0.001	0.316
No diagnosis	37% (n=166)	18% (n=80)	0.005	0.121
Psychotic disorder	14% (n=64)	14% (n=62)	< 0.001	0.486
Substance-use disorder	7% (n=29)	20% (n=89)	< 0.001	0.406
Anxiety disorder	6% (n=25)	6% (n=27)	< 0.001	0.271
Somatoform disorder	3% (n=15)	4% (n=18)	< 0.001	0.448
Delirium	3% (n=13)	16% (n=71)	0.015	0.078
Dementia	1% (n=6)	7% (n=30)	< 0.001	0.278
Adjustment disorder	1% (n=4)	10% (n=45)	< 0.001	0.107
Amnestic/cognitive disorder	1% (n=4)	3% (n=11)	0.002	0.131
Eating disorder	1% (n=3)	1% (n=2)	< 0.001	0.397
Personality disorder	<1% (n=1)	11% (n=48)	0.723	-0.005
Sleep disorder	<1% (n=1)	None	-	-
Dissociative disorder	None	<1% (n=1)	-	-
Intellectual disability	None	3% (n=12)		-
Factitious disorder	None	1% (n=2)	-	-
Sexual disorder	None	0<1% (n=1)	-	-

APPENDICES

APPENDIX A - Evolution and Scope of Consultation-Liaison Psychiatry

EVOLUTION OF CONSULTATION-LIAISON PSYCHIATRY

A number of historical trends in medicine resulted in the evolution of consultation-liaison psychiatry (CLP). Interest in the relationship between the mind and the body dates back to the medieval-Islamic world, where the Persian psychologist-physician Abu Zayd al-Balkhi (b. 850 CE) was the first to discuss disease in relation to both the body and the "soul" [1]. He was critical of many of his contemporaries for neglecting the psychological aspects of their patients and for placing exclusive emphasis on their physical illnesses. al-Balkhi postulated that imbalances in the body and soul resulted in illness, with both physical and psychological consequences. These unique ideas have led some authors to recognise al-Balkhi as a pioneer of what was later to be termed "mind-body medicine" [2].

In the Occident, the relationship between the mind and body, prior to the French philosopher Descartes (1596-1650), was largely viewed as unidirectional, with the mind wholly controlling the actions of the body. Descartes argued that the relationship between mind and body was to be viewed in a dualistic manner; that is, that the mind acts on the body, but that the body is also able to influence the mind [3]. These ideas influenced the German physician, Johann Heinroth (1773-1833), who introduced the term "psychosomatic" into the medical lexicon in 1818 [4].

In the 1970s, the American psychiatrist George Engel (1913-1990) proposed an alternative to the biomedical model, which he believed “leaves no room within its framework for the social, psychological, and behavioral dimensions of illness” [5]. The biopsychosocial (BPS) model was conceived by Engel from this viewpoint, and it now is a widely used approach employed in the management of illness.

The BPS model parallels the holistic movement, which is the philosophy that natural systems and their properties should be viewed as wholes as opposed to collections of their parts. Interestingly, the term “holism” was coined in 1927 by the South African philosopher and statesman Jan Smuts, in his book *Holism and Evolution* [6]. The interdisciplinary medical field known as psychosomatic medicine (colloquially referred to as mind-body medicine) has been heavily influenced by the BSP model and holism philosophy.

Psychosomatic medicine, an integral concept of CLP, is concerned with the interplay between physiological processes and social, psychological and behavioural factors and how they influence the wellbeing of people [7]. The term psychosomatic medicine is often used interchangeably with CLP, although the relationship between these disciplines has complex historical and semantic facets [8].

The term liaison psychiatry was coined by the American psychiatrist Edward Billings in 1940, in his book *A Handbook of Elementary Psychobiology and Psychiatry*, in which he set the theoretical foundations for the field [9]. The American Psychosomatic Society was founded in 1936, followed by the creation of the Academy of Psychosomatic Medicine in 1954 [10]. Despite this, CLP services were virtually unknown in Britain until the 1970s. Discussions took place between interested clinicians from the early 1980s until the Royal College of Psychiatrists

established the Faculty of Liaison Psychiatry in the United Kingdom in 1997 [11]. In the USA, CLP was formally recognised as a subspeciality by the American Psychiatric Association in 2003 [12]. After much debate it was decided to refer to CLP as psychosomatic medicine, as the term was entrenched in American psychiatric culture [13].

In South Africa, the University of Cape Town offers a Master of Philosophy in CLP, and the College of Psychiatrists recognises CLP as a subspeciality. The Health Professions Council of South Africa is currently considering creating a registerable CLP subspeciality.

SCOPE OF CONSULTATION-LIAISON PSYCHIATRY

The transition from the practice of psychiatry in remote “asylums” to the general hospital is regarded as a significant factor in the development of CLP. The principal care team refers patients to the consultation-liaison psychiatrist when there are questions about a patient's mental health and its effect on the patient’s treatment. The scope of CLP is wide ranging, but typical issues include psychiatric or behavioural problems in patients with medical conditions; assistance with the management of mentally ill patients who are admitted for medical or surgical treatment; assessment of capacity to consent to treatment; assistance with distress related to medical conditions in patients who do not have a psychiatric disorder; and assessment and management following an attempted suicide or self-injurious behaviour.

CLP referrals usually occur in the inpatient setting, although outpatients also are seen. Patients utilising emergency services and community clinics may also be referred. In CLP the therapeutic component of care is short term and is not intended

to interfere with the primary medical or surgical treatment. An integral part of CLP involves liaison with numerous other services, including the medical/surgical team, allied health services, social services and family members. Facilitating good relationships between the treating teams and their patients also augments assessment and management. At times the liaison psychiatrist may endeavour to settle conflicts between patients and their primary care team.

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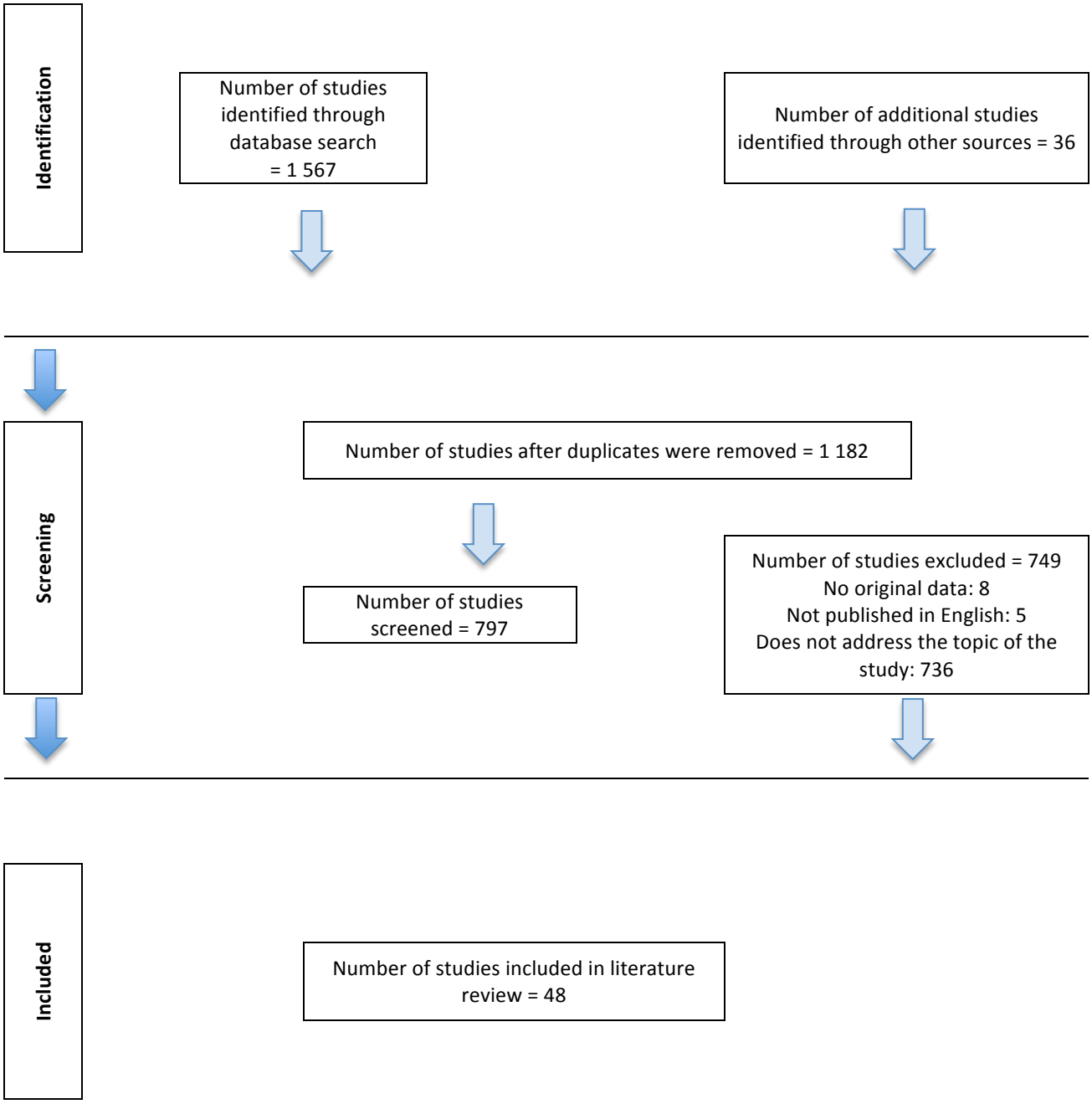
APPENDIX B – Literature Search Terms and Databases

Date searched: 01/05/2016

DATABASE SEARCHED	SEARCH TERMS AND LIMITATIONS	RESULTS	RELEVANT SOURCES
PubMed	(liaison OR consultation-liaison OR CLP OR psychosomatic OR psychosomatic medicine) AND (referral OR refer OR referrals OR second opinion OR psychiatric referral) AND (inpatient OR in-patient OR admitted OR consultation OR hospital patient OR hospitalised OR hospitalized)	1923	47
	Limitations:		
	English and Humans	684	
	Adulthood (> 18 years)	113	
SCOPUS	(liaison OR consultation-liaison OR CLP OR psychosomatic OR psychosomatic medicine) AND (referral OR refer OR referrals OR second opinion OR psychiatric referral) AND (inpatient OR in-patient OR admitted OR consultation OR hospital patient OR hospitalised OR hospitalized)	238	44
	Limitations:		
	Document type: article, review, short survey	227	
	Language: English	192	
	Medicine	190	
PsychINFO	(liaison OR consultation-liaison OR CLP OR psychosomatic OR psychosomatic medicine) AND (referral OR refer OR referrals OR second opinion OR psychiatric referral) AND (inpatient OR in-patient OR admitted OR consultation OR hospital patient OR hospitalised OR hospitalized)	862	31
	Limitations:		
	Publication type: academic journals	798	
	Language: English	712	
	Age: adulthood (> 18 years)	451	
	Major headings: consultation-liaison psychiatry, professional referral, professional consultation, hospitalized patients, hospitals, epidemiology, inpatient	77	
WEB OF SCIENCE	(liaison OR consultation-liaison OR CLP OR psychosomatic OR psychosomatic medicine) AND (referral OR refer OR referrals OR second opinion OR psychiatric referral) AND (inpatient OR in-patient OR admitted OR consultation OR hospital patient OR hospitalised OR hospitalized)	30	6
	Limitations:		
	Research areas: psychiatry	12	
	Language: English	9	
EBSCO Host (Africa-Wide Information, CINAHL, Health Source: Nursing/Academic Edition, PsycARTICLESBS	(liaison OR consultation-liaison OR CLP OR psychosomatic OR psychosomatic medicine) AND (referral OR refer OR referrals OR second opinion OR psychiatric referral) AND (inpatient OR in-patient OR admitted OR consultation OR hospital patient OR hospitalised OR hospitalized)	501	21
	Limitations:		
	Publication type: academic journals, journals, dissertations	428	
	Major headings: referral and consultation, psychiatry, mental disorder, mental health services, psychiatric service, psychiatric care, hospitals, inpatients	179	
	Language: English	177	
	Age: all adults	66	
African Index Medicus	Psychiatry and hospital	24	0

APPENDIX C- Summary of the Literature Search and Selection

Summary of the literature search and selection. Date searched: 01/05/2016



APPENDIX D – Additional Tables Not Included in the Main Manuscript

Table 3.1 Daily Referral Rate to CLP in Non-Occidental Countries (1983–2016)

Author, publication date	Year studied	Time period	Type of hospital	Country	N	Average number referrals [**]
Tema & Janse Van Rensburg, 2015 [1]	2009	6 months	Teaching	South Africa	884	4.8 / day
Wong & Yiu, 2014 [2]	2012-2013	3 years	General	China	1392	1.3 / day
Keertish et al., 2013 [3]	2011–2012	2 years	Teaching	India	520	0.7 / day
Risal & Sharma, 2013 [4]	2010-2011	1 year	Teaching	India	385	1.1 / day
Arbabi et al., 2012 [5]	2007	1 year	Teaching	Iran	503	1.4 / day
Gibson et al., 2010 [6]	2006-2007	1 year	Teaching	Jamaica	201	0.6 / day
Ramzan et al., 2010 [7]	2007	6 months	Military	India	427	2.3 / day
Singh et al., 2009 [8]	2009	7 months	Teaching	Nepal	484	2.3 / day
Özkan, 2005 [9]	1998 and 2002	2 years	Teaching	Turkey	2497	3.4 / day
Makanyengo et al., 2005 [10]	2002	1 year	Teaching	Kenya	332	0.9 / day
Ajiboye et al., 2004 [11]	2001	6 months	Teaching	Nigeria	47	0.3 / day
Aghanwa, 2002 [12]	1999-2000	18 months	General	Fiji	164	0.3 / day
Aghanwa et al., 1996 [13]	1987-1992	5 years	Teaching	Nigeria	87	1.5 / month
Özkan et al., 1995 [14]	1989-1991	2 years	Teaching	Turkey	889	2.4 / day
Paholpak, 1991 [15]	Unknown[*]	2 years	Teaching	Thailand	271	0.4 / day
al-Ansari et al., 1990 [16]	Unknown[*]	3 months	General	Kuwait	219	2.4 / day
Fido & Mughaiseeb, 1989 [17]	1987-1988	1 year	General	Kuwait	208	0.6 / day
Gangat et al., 1987 [18]	1985	6 months	Teaching	South Africa	597	3.3 / day
Malhotra & Malhotra, 1984 [19]	1978-1979	1 year	Teaching	India	336	0.9 / day

[*] Full article was not available [**] Author's calculations

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Table 3.2. Timing of Referral (days)					
	Minimum	Maximum	Median	Mean	Standard deviation
Time lag between referral and initial registrar review	0.0	87.0	0.00	0.9	4.48

Table 3.3. Number of Consultations					
	Minimum	Maximum	Median	Mean	Standard deviation
Registrar	0	7	1	1	1
Consultant	0	6	0	0	0
Psychologist	0	3	0	0	0

Table 3.4. Demographic Characteristics				
Gender	**Male**		**Female**	
Total n=452	38% (n=174)		61% (n=278)	
Age grouping	**0 – 17**	**18 – 59**	**60 +**	**Unknown**
Total n=452	8%	80%	9%	3%

Table 3.5. Referral Department	
Source of referral	**Referrals**
Medicine	**56% (n=252)**
General medicine	32% (n=145)
Medical specialty	24% (n=107)
Neurology	*6% (n=29)*
Intensive care unit	*5% (n=23)*
Oncology	*3% (n=14)*
Dermatology	*2% (n=10)*
Other	*7% (n=31)*
Surgery	**25% (n=113)**
General surgery	8% (n=37)
Surgical speciality	*17% (n=76)*
Orthopaedics	*6% (n=29)*
Obstetrics and Gynaecology	**13% (n=61)**
Obstetrics	*12% (n=52)*
Gynaecology	*2% (n=9)*
Paediatrics	**4% (n=19)**
Other	**3% (n=12)**

Table 3.6. Reason for Referral	
Evaluation of current psychiatric symptoms	87% (n=390)
General review of mental state	69% (n=310)
Opinion regarding aetiology of symptoms	34% (n=150)
Request for psychiatric intervention	17% (n=77)
Review of patient with a psychiatric history	15% (n=67)

Table 3.7. Psychiatric Symptoms Identified by the Referrer	
Mood	36% (n=159)
Suicidal behaviour	23% (n=102)
Behavioural problems	21% (n=94)
Psychosis and schizophrenia	16% (n=70)
Anxiety	9% (n=41)
Other	6% (n=25)
Substance related	5% (n=24)
Amnestic and cognitive	5% (n=22)
Somatoform	5% (n=20)
Delirium	4% (n=19)
Dementia	2% (n=7)
Adjustment	1% (n=5)
Eating disorders	1% (n=4)
Sleep	<1% (n=1)
Personality	<1% (n=1)
Factitious, dissociative and sexual and gender identity	No referrals

Table 3.8. Classification of Psychiatric Diagnosis			
	Presumptive	Differential	Definitive
Number	n=9	n=71	n=342
Percentage	2.1%	16.2%	78.3%

Table 3.9. Substance Use		
Substance use total		**21% (n=95)**
	Alcohol-use disorder	9% (n=41)
	Methamphetamine use	5% (n=22)
	Recreational use	*<1% (n=2)*
	Abuse	*4% (n=18)*
	Dependence	*<1% (n=2)*
Other substances		**8% (n=38)**
	Non-pathological	*1% (n=4)*
	Abuse	*4% (n=19)*
	Dependence	*3% (n=15)*

Table 3.10. Medical and Surgical Comorbidity		
Other		21% (n=96)
Infectious disease		19% (n=84)
Cardiovascular disease		13% (n=58)
Overdose/poisoning/toxicity		12% (n=52)
Obstetric/gynaecological problem		11% (n=51)
Neurological disease		11% (n=49)
Endocrine disorder		10% (n=45)
	Diabetes mellitus	*7% (n=30)*
	Thyroid disease	*2% (n=10)*
Malignancy		7% (n=30)
Thoracic/abdominal surgical disease		6% (n=28)
Orthopaedic problem		6% (n=27)
Gastrointestinal disease		6% (n=26)
Neurosurgical disease		5% (n=21)
Renal/genitourinary		5% (n=21)

Table 3.11. HIV and Referred Patients		
Presumed negative		83% (n=377)
Known negative		1% (n=4)
Known positive		16% (n=70)
Age distribution of HIV-positive patients		
Minimum	**Maximum**	**Mean**
9	61	33
Age grouping of HIV-positive patients		
Age 0-17	Age 18-59	Age 60+
n=2	n=64	n=1
Gender distribution of HIV-positive patients		
Male	n=23	
Female	n=47	

Table 3.12. Treatment Plan Following the Psychiatric Assessment	
Initiation of medication	31% (n=139)
Other	26% (n=116)
Adjustment of medication	19% (n=87)
Referral to Counsellor	19% (n=87)
Staff intervention	11% (n=48)
Referral to psychologist	9% (n=42)
Referral to social worker	9% (n=38)

Table 3.13. Outcome Following the Psychiatric Assessment	
Discharge	65% (n=292)
Psychiatric admission	14% (n=61)
Emergency psychiatry	*9% (n=40)*
Liaison unit	*5% (n=21)*
Death	2% (n=9)

Table 3.14. Follow-Up Plan After the Psychiatric Assessment	
No psychiatric follow-up	**24% (n=108)**
Outpatient psychiatric referral	
Community mental health clinic	*23% (n=103)*
Other	*20% (n=86)*
GSH psychiatry	*12% (n=52)*
GSH psychology	*3% (n=13)*
Child and adolescent psychiatry service	*1% (n=6)*

APPENDIX E – Guide for Authors – General Hospital Psychiatry

GENERAL HOSPITAL PSYCHIATRY

Psychiatry, Medicine and Primary Care

AUTHOR INFORMATION PACK

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ISSN: 0163-8343

DESCRIPTION

General Hospital Psychiatry explores the many linkages among **psychiatry**, **medicine**, and **primary care**. In emphasizing a biopsychosocial approach to illness and health, the journal provides a forum for professionals with clinical, academic, and research interests in psychiatry's role in the mainstream of medicine.

See Aims and Scope for further information about the journal and what we publish.

AUDIENCE

Psychiatrists, General and Family Practitioners, Internists, Nurses, Pharmacologists, Psychologists and Health Care Para-Professionals.

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Aims and Scope of General Hospital Psychiatry

General Hospital Psychiatry explores the many linkages among psychiatry, medicine, and primary care. The journal provides a forum for professionals with clinical, academic, and research interests in psychiatry's role in the mainstream of medicine. The journal expands on traditional models of consultation-liaison, inpatient, and outpatient services in the general hospital to address all aspects of ambulatory, inpatient, emergency, and community care. Examination of novel assessment methods or intervention techniques, and reports from intervention trials that are related to the interface between medicine and psychiatry, are especially relevant to the journal's objectives, as are examinations of these phenomena on cost, cost-effectiveness, and public policy.

General Hospital Psychiatry will publish original research articles, topical reviews (especially systematic reviews and meta-analyses), and brief communications on: (1) biopsychosocial approaches to medicine, including models of collaborative and integrated care, (2) inpatient and outpatient consultation-liaison psychiatry, (3) psychosomatic medicine (including research on somatic symptoms, assessment methods in general medical settings, and assessment and treatment in persons with specific medical conditions), (4) inpatient, emergency, and crisis psychiatry, (5) the relationship of psychiatric services to general medical systems (e.g., primary care clinics, hospitals, local/national policy), (6) new directions in medical education that stress psychiatry's role in primary care, family practice, and continuing education, and (7) health psychology.

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Numbers and percentages should be presented in the same cell. Similarly, measures of variability (SD, 95% CI) should be in the same cell as their corresponding statistic. When presenting percentages, include the numbers from which they were calculated. For example, the number of subjects (denominator) can be included in a header - e.g., Control (N=130) - while the numerator and percentage can be displayed in the cell, e.g.: 83 (64). Include variability where applicable (e.g., mean [SD] or median [interquartile range]).

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Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text. If these references are included in the reference list they should follow the standard reference style of the

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[1] Van der Geer J, Hanraads JAJ, Lupton RA. The art of writing a scientific article. J Sci Commun 2010;163:51–9.
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[2] Strunk Jr W, White EB. The elements of style. 4th ed. New York: Longman; 2000.
Reference to a chapter in an edited book:
[3] Mettam GR, Adams LB. How to prepare an electronic version of your article. In: Jones BS, Smith RZ, editors. Introduction to the electronic age, New York: E-Publishing Inc; 2009, p. 281–304.
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- Preferred fonts: Arial (or Helvetica), Times New Roman (or Times), Symbol, Courier.
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- Use a logical naming convention for your artwork files.
- Indicate per figure if it is a single, 1.5 or 2-column fitting image.
- For Word submissions only, you may still provide figures and their captions, and tables within a single file at the revision stage.
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A detailed guide on electronic artwork is available.
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The following list will be useful during the final checking of an article prior to sending it to the journal for review. Please consult this Guide for Authors for further details of any item.

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- Keywords
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- All tables (including title, description, footnotes)

Further considerations

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- All references mentioned in the Reference list are cited in the text, and vice versa
- Manuscript is written in clear English, and follows the journal's guidelines including statistical guidelines and inclusion of checklists as appropriate
- Permission has been obtained for use of copyrighted material from other sources (including the Internet)

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APPENDIX F – Approval of Registration of Registry by HREC

UNIVERSITY OF CAPE TOWN

Faculty of Health Sciences
Human Research Ethics Committee
Room E52-24 Groote Schuur Hospital Old Main Building
Observatory 7925
Telephone (021) 406 6626 • Facsimile (021) 406 6411
e-mail: Sumayah.arlafdien@uct.ac.za

16 May 2013

REF NO: R025/2013

Dr J Hoare
Psychiatry & Mental Health
J-2
OMB

Dear Dr Hoare

PROJECT TITLE: CONSULTATION LIAISON PSYCHIATRY REFERALS-J-2

Thank you for submitting your Registry to the Faculty of Health Sciences Human Research Ethics Committee for approval.

The HREC has **approved** the registration of your registry.

The registration of this registry is valid until 16 May 2016.

Please provide the HREC with an update if the registry continues beyond this period.
Please Note: All research, including that undertaken for a master's or doctoral degree, using registered databases, registries and repositories, requires submission as a new study. It requires an application form (FHS013) and a protocol which has undergone departmental review. The study will receive its own HREC REF number which will be linked to the main database or repository.

Please provide the HREC with an update if the registry continues beyond this period.

Please quote the HREC REF in all your correspondence.

Yours sincerely

PROFESSOR M BLOCKMAN
CHAIRPERSON, HSF HUMAN ETHICS

sArlafdien

APPENDIX G – Data Capture Form

Consultation Liaison Psychiatry Data Sheet

Name, age, gender	
Ward, department	
Reason for referral **Date of referral:**	
Axis I	
Axis II	
Axis III	
Axis IV	

Review (dates):

Assessment by registrar	Consultant ward round	Reviews by registrar	Reviews by consultant	Reviews by psychology

Intervention:

None	Medication initiation	Medication adjustment	Supportive counselling	Psychology input	Social work	Staff intervention	Other

Outcome:

Discharged	Deceased	Transfer to C23	Transfer to G22	Out patient follow up	Other

Follow up plan:

None	Community clinic	J2 psychiatry	J2 Psychology	C23	G22	DCAP	Other

APPENDIX H – Confidentiality Agreement with Research Data Capturer

Confidentiality Agreement for Research Assistant

Project title: A Retrospective Analysis of Referrals to Consultation Liaison Psychiatry over a Two-Year Period at a Tertiary Hospital in South Africa.

Investigators: Dr John Torline (Primary Investigator, MMed Candidate, UCT)
Dr. J. Hoare (Department of Psychiatry and Mental Health UCT)
Dr. K. Louw (Department of Psychiatry and Mental Health UCT)

☑ I understand that all the material I will be asked to record and/or transcribe is confidential

☑ I understand that the contents of the consent forms, interview tapes, sound files or interview notes can only be discussed with the researchers.

☑ I will not keep any copies of the information nor allow third parties to access them.

☑ I will delete all interview and other relevant files from my computer after transcription.

Research Assistant's signature: _____

Research Assistant's name: Asantewa C. Oduro_____

Date: 13/12/2013_____

Signature of PI: John Torline_____

Name of PI: _____