Management of cancer pain: Knowledge and attitudes of healthcare professionals

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INDEX

INTRODUCTION

The control of pain is an important aspect of patient care for physicians who deal with cancer and has significant impact on the quality of life of patients[1]. With appropriate care, pain can be controlled in 90% of patients who have advanced malignant conditions[2]. Despite the increased interest in pain as a symptom and advances in treatments, the general consensus has been that pain is still an under treated symptom of acute and chronic illness. Many barriers to adequate pain management have been identified, and one of the major barriers to achieving comfort for those in pain is inadequate knowledge on the part of healthcare professionals about pain and its treatment.[1,3,4]

Recent studies have described the prevalence and severity of pain due to cancer.[5,6] However very few studies have been published on the management of cancer pain in South Africa, although it has been documented that pain is often under treated.[5] Factors such as variations in practice, provider, setting and geographic location appear to influence cancer pain relief in South Africa. [40]

The aim of this study is to determine whether knowledge of pain and the attitudes of healthcare professionals towards pain is a barrier to effective pain management in oncology patients in South Africa. An assessment of hospital setting, and professional discipline may provide valuable insight into pain management.

It is hoped that with this research, knowledge deficits may be identified and an appropriate education program developed to target each healthcare professionals' needs, in order to improve pain management in oncology patients in South Africa.

OBJECTIVES

1. To evaluate knowledge and attitudes of nurses and physicians working with oncology patients at the Pretoria Academic Hospital and the Mary Potter Oncology Centre in Pretoria regarding the management of cancer pain.
2. To determine whether differences exist between these groups based on practice setting, years of service or professional discipline.

LITERATURE STUDY

A. CANCER PAIN

Adequate assessment is the critical first step to define a treatment strategy for the patient with pain. The World Health Organisation Cancer Pain Relief Programme provides an approach for the management of cancer pain based upon the construct that nothing would have a greater impact on the quality of life of patients with pain and cancer than the implementation of existing knowledge in pain assessment and treatment. Freedom from pain is seen as the right of every cancer patient, and access to pain therapy is a measure of respect for this right.

B. EPIDEMIOLOGY OF PAIN

Prevalence data indicates that there are currently about 17 million people living with cancer worldwide[7],[8]. The prevalence of pain increases with the progression of disease. The intensity, type and location of pain varies according to the primary site of cancer, extent of disease, progression and the treatments employed. Prevalence rates of 30 to 40 percent of patients in active therapy report pain and 70 to 90 percent of patients with advanced disease report pain. Uncontrolled pain precludes a satisfactory quality of life. Persistent pain markedly interferes with activities of daily living and social interactions. There is an increased risk of anxiety, depression and suicidal inclinations. Cancer pain is a major problem and significantly impacts quality of life.

C. BARRIERS TO PAIN ASSESSMENT AND ADEQUATE PAIN MANAGEMENT

Patient related barriers

- reluctance to report pain
- reluctance to follow treatment recommendations
- fear of tolerance
- fear of addiction
- concern about side effects

- belief that pain is inevitable and must be accepted
- fear of disease progression
- fear of injections

Physician related barriers

- inadequate knowledge
- poor assessment of pain
- concern about regulation of controlled substances
- fear of patient addiction
- concern about side effects
- concern about tolerance

Institution related barriers

- low priority given to cancer pain treatment
- restrictive regulation of controlled substances
- problems of availability of treatment or access to it
- lack of economic resources
- failure to use validated pain measurement tools

D. ACUTE AND CHRONIC PAIN

Pain caused by cancer may be caused by direct effects of the disease (e.g. tumour infiltration), or by treatment associated with the disease (e.g. chemotherapy and radiation therapy.)[9] A major distinction between acute and chronic pain may be found in the differences in central neural responses induced by the chronic afferent neural impulses of nociceptor activity. Changes in central neural processing induced by these impulses activate N-methyl-D-aspartate (NMDA) receptors, which may allow a persistent pain sensation to occur in the presence of diminishing nociceptive activity. Acute pain may be associated with psychological reactions such as anxiety and fear and may be accompanied by activation of the sympathetic nervous system. Many of these reactions become habituated as pain persists. Adaptation of sympathetic activity and development of chronic vegetative signs e.g. decrease in appetite, malaise, irritability and sleep disturbances characterize chronic pain. The cancer patient suffers both acute and chronic pain.

Different types of pain have been distinguished:

- somatic
- visceral
- neuropathic
- sympathetically mediated pain

E. TYPES OF PAIN

Definition of pain: an unpleasant sensory and emotional experience associated with actual or potential tissue damage. Pain is always subjective.

Somatic / nociceptive

- Activation of nociceptors in cutaneous and deep muscular/skeletal tissues
- Well localized (e.g. bone metastasis, post surgical incisional pain, myofascial pain, musculoskeletal pain, fracture, cellulitis)

Visceral Pain

- Infiltration, compression, distension of thoracic and abdominal viscera (e.g. liver metastasis, pancreatitis, peptic ulcer, myocardial infarction)
- Poorly localized, deep pain, pressure
- Associated with nausea and vomiting
- Often referred pain to cutaneous sites

Neuropathic pain

- Injury to peripheral or central nervous system
- Deafferentation pain results after injury to peripheral neural structures
- Central pain results after injury to central neural structures
- In cancer patients, usually due to tumour compression or infiltration of nerve (e.g. radiation plexopathies, spinal cord compression, drug neuropathies)
- Severe pain often with burning or shock like sensations

Complex regional pain syndrome

- persistent focal pain with or without evidence of sympathetic involvement

CANCER PAIN SYNDROMES

Cancer pain has also been classified according to a series of common pain syndromes.

Table 1: Acute Cancer Pain Syndromes[8]

Acute Pain Associated with Diagnosis and Therapeutic Interventions
Acute pain associated with diagnostic interventions Lumbar puncture headache Arterial or venous blood sampling Bone-marrow biopsy Lumbar puncture
Acute postoperative pain
Acute pain caused by other therapeutic interventions Pleurodesis Tumour embolization
Acute pain associated with analgesic techniques Injection pain Spinal opioid hyperalgesia syndrome Epidural injection pain
Acute pain Associated with Anticancer Therapies
Acute pain associated with chemotherapy infusion techniques Intravenous infusion pain Venous spasm Chemical phlebitis Vesicant extravasation Anthracycline-associated flare reaction Acute pain associated with chemotherapy toxicity Mucositis
Acute pain associated with hormonal therapy Hormone-induced acute pain flare in breast cancer
Acute pain associated with radiation therapy Oropharyngeal mucositis Acute radiation enteritis and proctitis
Acute pain associated with infection Acute herpetic neuralgia

Table 2: Chronic Cancer Pain Syndromes[8]

Tumour Related Pain Syndromes	**Chronic Pain Syndromes Associated With Cancer Therapy**
Bone Pain Multifocal or generalized bone pain. Vertebral syndromes Back pain and epidural compression Pain syndromes of the bony pelvis and hip	**Post chemotherapy pain syndromes** Chronic painful peripheral neuropathy Avascular necrosis of femoral or humeral head
Headache and facial pain Intracerebral tumor Leptomeningeal metastases Base of skull metastases Painful cranial neuralgias	**Chronic pain associated with hormonal therapy** Gynecomastia with hormonal therapy for prostate cancer
Tumour involvement of the peripheral nervous system Tumour-related radiculopathy Brachial plexopathy Malignant lumbosacral plexopathy Tumour-related mononeuropathy Paraneoplastic painful peripheral neuropathy	**Chronic postsurgical pain syndromes** Postmastectomy pain syndrome Post-radical neck dissection pain Post-thoracotomy pain Postoperative frozen shoulder Phantom pain syndromes Stump pain Postsurgical pelvic floor myalgia
Pain syndromes of the viscera and miscellaneous tumour-related syndromes Hepatic distension syndrome Midline retroperitoneal syndrome Chronic intestinal obstruction Peritoneal carcinomatosis Malignant perineal pain Ureteric obstruction	**Chronic post radiation pain syndromes** Plexopathies Chronic radiation myelopathy Chronic radiation enteritis and proctitis Burning perineum syndrome Osteoradionecrosis

F. PAIN ASSESSMENT

Medical History (including alcohol or drug dependence)[10]

Oncological history, i.e. extent of disease and prognosis

Pain history (Believe the patients' complaint of pain)

- quality
- intensity using a numerical rating scale, visual analogue scale or verbal descriptor scale
- Location and radiation
- Palliating and provoking factors
- Temporal characteristics: acute, subacute, chronic
- Duration
- Cause
- Impact on activities, sleep and mood
- Associated factors such as numbness, weakness, vasomotor changes and fatigue
- Previous medication (drug, dose frequency, effect, side effects and duration)

Look out for common pain syndromes: Acute and chronic

Psychosocial evaluation

- Psychological symptoms e.g. anxiety, depression, anger
- Psychiatric disorder, e.g. delirium, major depression
- "Meaning" of pain to significant others
- change in mood state
- family functioning
- financial problems
- psychosocial support system
- patient's expectations and preconceptions regarding pain management
- cultural and language issues
- spiritual issues, guilt and regret

Physical examination

- General medical
- Neurological
- Pain site and surrounding area
- Possibility of referred pain
- Look for signs of superior vena cava syndrome and spinal cord compression

Diagnostic evaluation

- X-rays
- Bone scans
- CT scans / MRI
- Blood tests as indicated

Impressions

- Possible aetiology
- Probable pathophysiology

Treatment plan

- aim is to relieve and prevent pain
- good communication
- reassurance of patient and family
- encourage patient participation
- multidisciplinary plan of care to address disease, physical, psychosocial problems, social difficulties, cultural issues and spiritual concerns
- repeated reassessment

Modalities of treatment

- treat underlying cancer
- analgesics – opiates and non-opiates
- adjuvants – tricyclic antidepressants, anti convulsants, local anaesthetics, steroids
- manage drug side effects
- TENS
  neurolytic procedures
- Physical interventions – maintain mobility, heat, cold, immobilization, repositioning, massage, vibration, exercise, acupuncture
- Psychological interventions – relaxation and imagery; hypnosis; cognitive distraction; patient education; psychotherapy; support groups; pastoral counselling
- Lifestyle modification
- Treat any aspect causing suffering

Discharge planning

The patient needs to be assessed regularly and must have a contact person should any new problem arise.

G. TREATMENT OF CANCER PAIN

Treatment with analgesic drugs is the mainstay of cancer pain management. Drugs whose primary clinical action is the relief of pain are conventionally classified on the basis of the site of activity at opioid receptors as either opioid or non-opioid analgesics. A third class, the adjuvant analgesics, are drugs with other primary indications that can be effective analgesics in specific circumstances. The major group of drugs used in cancer pain management are the opioid analgesics.[8,11,12,13,14]

1. OPIOIDS

Opioid receptors		Response on activation
μ	(μ^1 + μ^2)	• analgesia • respiratory depression • miosis • euphoria • reduced gastrointestinal motility
κ	(κ_1, κ_2, κ_3)	• analgesia • dysphoria • miosis • psychotomimetic effects
δ	(δ_1,δ_2)	• analgesia
σ		• not a true opioid receptor because effects not reversed by Naloxone

Opioid analgesics

Agonists (no ceiling effect to analgesia)

- morphine
- codeine
- oxycodone
- oxymorphone
- levorphanol
- dihydrocodeine
- pethidine
- hydromorphone
- methadone
- fentanyl
- dextropropoxyphene
- diamorphine
- tramadol
- dipipanone

Partial agonists (ceiling effect)

- buprenorphine

Agonist – antagonists (agonist at one receptor and antagonist at another – ceiling effect to analgesia)

- pentazocine → agonist on κ; antagonist on μ — Can cause withdrawal syndrome
- butorphanol
- nalbuphine

Antagonists

- naloxone
- naltrexone

Table 3 : Equinalgesic doses[15,16]

	Equianalgesic Doses* (mg)			
Opioids/Narcotics	Parenteral IM/SQ/IV	Oral	Conversion Factor IM/SQ/IV to PO	Comments
Opioid Agonists: Morphine-like, mu agonists) Morphine	10	30	3	Standard of comparison. Also available as controlled release tablets and rectal suppositories. Single oral dose may require conversion of 6.
Codeine	130	200 NR	1.5	Doses over 65mg may produce diminishing incremental analgesia. Oral tablets usually compounded with non-opioid.
Dihydrocodeine (DF118)	-	150? NR	-	Equianalgesic data not available. Usually compounded with non-opioid
Fentanyl (Duragesic)	-	-	-	Transdermal (Duragesic) patches available in 25, 50, 75, 100 μg/hr. Equianalgesic conversion is controversial. Using oral/parenteral ratio 3/1 for morphine, 1 μg/hr of transdermal fentanyl roughly equivalent to oral morphine 2mg/2 hr. Toxic metabolite norfentanyl may accumulate.
Methadone (Physeptone)	10	20	2	Accumulates on day 2-5
Meperidine (Pethidine)	75	300 NR	2	Normeperidine (toxic metabolite) accumulates with repetitive doses, causing CNS excitation. Avoid high frequent doses, chronic use and use in patients

Propoxyphene hydrochloride Propoxyphene napsylate	-	400? NR	-	with impaired renal function. 65-130mg PO approximately equal to 1/6 the doses listed in this chart. Propoxyphene and toxic metabolite norpropoxyphene accumulate with repetitive dosing
Partial Agonists: Buprenorphine (Temgesic)	0.4	-	-	May produce withdrawal in opioid-dependent patients. May be given with mu agonists.
Mixed Agonist-antagonists: Limited usefulness in cancer pain. Do NOT use in combination with morphine-like drugs: may reverse analgesia; may precipitate withdrawal in opioid-dependent patients				
Nalbuphine (Nubain) Pentazocine (Sasenol)	10 60	- 180	 3	

- Equianalgesic doses are approximate; use only as a guideline. All doses must be titrated to individual's response. Parenteral doses are initial IM doses for acute pain in adults; may be used to convert doses for IV infusions and repeated small IV boluses. For single IV bolus, use half IM dose. For patients over 70, consider lowering starting parenteral doses by 25-30%. The oral doses are not necessarily starting doses.
- NR – not recommended at that dose.
- ? – Dose is questionable due to lack of well controlled research.

World Health Organization Analgesic Ladder[17,18]

Intensity of pain is the prime consideration in analgesic selection. The WHO analgesic ladder advocates three basic steps:

1. Mild cancer related pain should be treated with a non-opioid analgesic, which should be combined with adjuvant drugs if a specific indication for these exists.
2. Moderate pain or failure to respond to non-opioid analgesics should be treated with a "weak" opioid e.g. codeine, hydrocodone, dihydrocodeine, or propoxyphene. These drugs are often combined with non-opioids and may be co-administered with an adjuvant analgesic.
3. Severe pain not responding on the second step of the analgesic ladder should receive a "strong" opioid e.g. morphine, diamorphine, fentanyl, oxycodone, hydromorphone, methadone. These drugs may also be combined with a non-opioid analgesic or an adjuvant drug.

When combined with appropriate dosing guidelines, this approach is capable of providing adequate relief to roughly 80% of patients.

Scheduling opioid administration

1. "Around the clock dosing" – to provide the patient with continuous relief by pre-empting recurring pain
2. Rescue doses is a supplemental dose given on an as-needed basis to treat pain that breaks through the regular schedule

Dose selection and adjustment

Initial dose selection: 10 – 20mg oral morphine every 4 hours. Dose titration: gradually escalate dose until adequate analgesia or intolerable side effects. Increase dose in increments of 30 – 50%. The absolute dose is immaterial as long as the balance between analgesia and side effects remain favourable. E.g. use oral morphine q 4 hours and the same dose for breakthrough pain given as often as required and then review total dose of morphine daily.

Adverse effects of opioid analgesics

1. sedation
2. constipation

3. nausea and vomiting
4. urinary retention
5. multifocal myoclonus
6. respiratory depression
7. urticaria and pruritis

2. NON OPIOID ANALGESICS

Non opioid analgesics encompass the non-steroidal anti-inflammatory drugs (NSAID's), paracetamol and nefopam – they are used widely in the management of mild and moderate pain.

Classification of NSAID's

Salicylates	•	aspirin
	•	diflunisal
Acetates	•	diclofenac
	•	indomethacin
	•	sulindac
	•	tolmetin
Proprionates	•	fenbufen
	•	fenoprofen
	•	flurbiprofen
	•	ibuprofen
	•	ketoprofen
	•	naproxen
	•	ketorolac
Fenamates	•	flufenamic acid
	•	mefenamic acid
Oxicams	•	piroxicam
	•	tenoxicans
Pyrazolones	•	azapropazone
Phenylbutazone		
Butazones	•	nabumetone

Table 4 : Selected nonopioid analgesics: analgesic dosage and comparative efficacy to standards[19]

Drug	Proprietary Names (not all-inclusive)	Average analgesic dose (mg)*	Dose interval (hours)	Maximal daily dose (mg)	Pediatric Dose (mg/kg)	Analgesic Efficacy compared to standards	Plasma half-life (hours)	Comments
Acetaminophen	numerous	500 – 1,000	4-6	4,000	10-15 q4-6hr	Comparable to aspirin	2-3	
Salicylates Aspirin	Numerous	50 – 1,000	4-6	4,000	10-15 q4-6hr		0.25	
Diflunisal	Dolobid	1,000 initial, 500 subsequent	8-12	1,500	-	500mg superior to aspirin, 650mg with slower onset and longer duration; an initial dose of 1,000mg significantly shortens time to onset	8-12	-
NSAID's Propionic Acids Ibuprofen	Brufen	200-400	4-6	2,400	10 q6-8hr	Superior at 200mg to aspirin 650mg	2-2.5	-
Naproxen	Naprosyn	500 initial, 225	6-8	1,250	5bid	-	12-15	-

		subsequent						
Naproxen sodium OTC	ALeve	220mg	8-12	-	-	Comparable to aspirin	2-3	-
Fenoprofen	-	200	4-6	800	-			
Ketoprofen		25-50	6-8	300	-			
Indolacetic Acids Indomethacin	Indocid	25	8-12	100	-	Comparable to aspirin 650mg	2	Not routinely used because of high incidence of side effects; rectal, IV, and sustained-release oral forms available for adults
Pyrrolacetic Acids Ketorolac	Toradol	30 or 60mg IM or 30mg IV initial, 15 or 30mg IV or IM subsequent	6	150 first day, 120 thereafter	-	In the range of 6-12mg of morphine	6	Limit treatment to 5 days; may precipitate renal failure in dehydrated patients
Anthranilic Acids Mefenamic acid	Ponstan	500 initial, 250 subsequent	6	1,500	-	Comparable to aspirin 650mg	2	

Phenylacetic Acids Diclofenac potassium	Cataflam	50mg	8	150	-	Superior in efficacy and analgesic duration to aspirin 650mg		-

* All doses are oral unless otherwise specified

Adverse Effects of NSAID's

1. Gastrointestinal : dyspepsia, nausea, vomiting, peptic ulcer disease
2. Nephrotoxicity : fluid retention, impaired renal function
3. Bronchospasm in asthmatics
4. Inhibition of platelet aggregation
5. Other – Angioedema
   Thrombocytopenia
   Haemolytic anemia
   Reye's syndrome
   Hepatitis
   Diarrhoea
   Anaphylaxis

3. ADJUVANT ANALGESICS IN PAIN MANAGEMENT

The term "adjuvant analgesic" describes any drug that has a primary indication other than pain, but is analgesic in some painful conditions.

Antidepressants and anticonvulsants may be effective in neuropathic pain.[11] Psychostimulants can decrease opioid-induced sedation. Glucocorticoids are effective anti-inflammatory agents and are also used to reduce pain associated with brain oedema and epidural metastases. Muscle relaxants, anxiolytics, antispasmodics and neuroleptics are also employed for specific indications. Bisphosphonates are indicated for bone metastases. Caution must be exercised in the use of adjuvant drugs with sedative properties, because the dose of opioids should not be compromised by the toxicities of these secondary agents.

Table 5: Commonly Used Adjuvant Analgesics for Cancer Pain[8]

Drug Category	Indications	Drugs	Common Toxicities	Comments
Antidepressants	Neuropathic pain	Amitriptyline Nortriptyline Desipramine	Sedation, dry mouth, constipation, postural hypotension, urinary retention	Begin with low doses (10-25mg); increase dose every few days; expect to see pain relief within several days, mood elevation within several weeks
Anticonvulsants	Neuropathic pain, myoclonic jerks	Phenytoin Carbamazepine Valproic acid Clonazepam Gabapentin	Drowsiness, dizziness, nausea, rash, bone marrow depression	Use loading dose with phenytoin; monitor platelets with carbamazepine
Psychostimulants	Opioid-induced sedation	Dextroamphetamine Methylphenidate	Nervousness, irritability, insomnia, dizziness, dry mouth	Give early in the day to avoid insomnia; do not use if patient is already delirious or confused
Corticosteroids	Spinal cord compression, increased intracranial pressure, visceral distension. Muscle spasm	Decadron Methylprednisolone Prednisone	Gastritis, insomnia, fluid, retention, hyperglycemia, proximal myopathy, increased appetite	
Muscle relaxants	Muscle spasm	Diazepam Baclofen	Sedation, dizziness, nausea, weakness,	

			confusion	
Benzodiazepines	Muscle spasm, anxiety, insomnia	Diazepam Lorazepam Alprazolam Temazepam	Sedation, delirium, hypotension, headache, respiratory depression	No analgesics, synergistic effect with opioids can cause respiratory depression
Antispasmodics	GI or bladder spasm	Diphenoxylate & atropine, loperamide, scopolamine patch	Sedation, dry mouth, constipation	
Neuroleptics	Delirium, agitation, nausea and vomiting, hiccoughs	Haloperidol, prochlorperazine, chlorpromazine	Sedation, orthostatic hypotension, confusion, extrapyramidal reactions	Useful for symptoms other than pain; (methotrimeprazine has analgesic properties)
Bisphosphonates	Bone pain	Pamidronate	Hypocalcemia, fever, GI disturbances, anemia	Delays time to painful skeletal events; also used with analgesics for bone pain

4. OTHER MODALITIES IN PAIN MANAGEMENT

- Transcutaneous electrical nerve stimulation (TENS)
- Neurolytic procedures
- Physical interventions
  - heat
  - cold
  - immobilization
  - massage
  - vibration
  - exercise
- psychological interventions
  - relaxation and imagery
  - hypnosis
  - cognitive distraction
  - psychotherapy
- chemotherapy
- radiotherapy

The vast majority of cancer pain can be well controlled with therapies readily available to most physicians. Providing this optimal cancer pain relief tests the skills and commitment of physicians, nurses and pharmacists.

H. KNOWLEDGE AND ATTITUDES TOWARDS PAIN MANAGEMENT

Studies of healthcare professionals knowledge and attitudes around the world have documented numerous misconceptions about cancer pain management.[26] These include misunderstandings about the prevalence and inevitability of cancer pain; misconceptions about pain assessment; inappropriate beliefs about addiction and drug tolerance; inappropriate knowledge of opioid pharmacology including choice of drug, doses, routes and schedules of administration. Most of these studies focused on single groups[1,3,15,20,22,25] of healthcare professionals, however a few studies compared responses of different healthcare professionals[4,26] to the same set of questions.

From these comparative studies it was found that physicians were most knowledgeable about pain management and pharmacists were least knowledgeable, with nurses knowledge in between these two groups. Studies of nurses, reported that hospice nurses scored higher than hospital oncology nurses regarding overall pain management. [27]

Amongst physicians it was reported that medical oncologists were more aggressive in the management of pain than radiation oncologists[3] and healthcare professionals in anaesthesiology had the most knowledge regarding pain management, while those in surgical disciplines the least. Studies reported poor pain management knowledge in primary care physicians when compared to medical oncologists.[28,29]

Studies of knowledge and attitudes to pain management have been done in numerous countries including Italy,[30] Belgium,[31] France,[35] USA,[27,28,32,33] Australia,[34] Taiwan,[36] and Israel.[37] These studies show pain knowledge deficits in healthcare professionals although different measurement tools in different languages were used. No similar studies have been done to date in South Africa.

Beck found however that in South Africa, the lowest incidence of severe pain was experienced in the hospice setting while the highest incidence was in inpatients. Beck also found that in the African culture, views about cancer, prevent patients from seeking treatment, even for pain.[39] The main barrier to effective pain management according to the research by Beck was the lack of knowledge by professionals and patients, although a lack of resources and cultural differences were also found to be significant barriers.[40]

From these studies it appears that no standardised method exists for measuring knowledge and attitudes towards cancer pain management, many surveys were developed for particular studies and some surveys were modified from other studies. The Nurse's Knowledge and Attitude Survey was however used in numerous studies and has been statistically validated to discriminate between levels of expertise.[21,22,23,38]

METHOD

A questionnaire[20] to assess prevailing knowledge and beliefs by healthcare professionals towards the management of pain was used. The Nurses Knowledge and Attitudes Survey (NKAS) was developed in 1987 and has been used extensively.[21 22 23 38] This survey was developed at the University of Wisconsin and consists of 37 items (Appendix II).

Regarding issues of reliability and validity: This tool has been developed over several years. Content validity has been established by a review of pain experts. The content of the tool is derived from current standards of pain management such as the American Pain Society, the WHO and the Agency for Health Care Policy and Research. Construct validity has been established by comparing scores of nurses at various levels of expertise such as students, new graduates, oncology nurses, graduate students and senior pain experts. The tool was identified as discriminating between levels of expertise. Test-retest reliability was established (r>.50) by repeat testing in a continuing education class. Internal consistency reliability was established (alpha r> .70) with items reflecting both knowledge and attitude domains.

The survey was distributed to a convenience sample of nurses and physicians working with oncology patients at Pretoria Academic Hospital, a state hospital and Mary Potter Oncology Centre, a private hospital with attached hospice. Convenience sampling was used as I thought that the staff working at these institutions would be fairly representative of professionals treating people with cancer pain, it would be a on a voluntary participation basis, all the institutions listed were in close proximity to where I live and work and accessing the staff via questionnaires would not present a problem. I would also be able to follow-up quite easily on any queries which may have arisen. Because some members of this population of professionals have no chance of being sampled, the extent to which this sample represents the entire population in this group cannot be known. However, it does provide some insights and could be a good source of data in exploratory research of the nature that I am doing. Each survey included a statement (Appendix I) indicating the purpose of the research and that all data is strictly confidential. All results are presented in summary form and no individuals are identified. Surveys were distributed and statistics for each response is reported. As surveys were distributed to healthcare professionals, in order to protect their anonymity a signed informed consent was

excluded. No patients were evaluated for this study and participation was completely voluntary. The return of the completed survey implied the consent of the subject

Statistics were done using the NCSS statistics program.

The Ethics Committee of the Pretoria Academic Hospital and University of Cape Town approved this study.

RESULTS

Of 180 surveys distributed, 103 were returned, giving a response rate of 57,2%. Average physician response is reported to be 54% with 68% for non physicians.[43] No system was in place to encourage the completion and return of the surveys or to ensure complete comprehension of the questions. Interpretation and language issues may have played a role in the poor response rate, although this was not evaluated. Also no incentive was provided to encourage a better return of the surveys. A total of 103 healthcare professionals responded to the survey. One healthcare professional did not agree to complete the survey and two of the surveys were inadequately completed and thus excluded from the study. Reasons for non completion was not obtained.

Most of the participants were nurses (76%) with the least being pharmacists (4%), and physicians comprised the rest (20%). This appears to be a fair representation of the population studied, however as this was a small sample it may make comparison difficult. Unfortunately the number of available pharmacists at these institutions was very limited and they should perhaps not have been included in the research study. Only four pharmacists completed the survey and as this may not be an accurate representation of knowledge and attitudes of pharmacists, these surveys have also been excluded. The study was thus only able to compare physicians and nurses knowledge and attitudes towards cancer pain management. Demographic data of the responding healthcare professionals is summarised in table 1.

The highest qualification was a diploma in 58% of participants, which may represent the large proportion of the nurses. A bachelors degree was held by 34% of the participants. The majority of participants worked in the state hospital setting (72%) with only a minority of participants working in a hospice setting (7%). Unfortunately the survey did not make allowance for healthcare professionals working perhaps in two different settings, this was an oversight. As the survey was designed to assess cancer pain management the majority of participants worked in an oncology area (67%). Only 11 male participants completed the survey while 89 were female, this may represent the gender distribution often seen in the medical field, as most nursing staff is female. Most participants were between the ages of 30 and 50 (47%), with the average years of experience being 14.12 years. 98% of participants did see cancer patients.

Table 2 lists the 37 survey questions and the percentage of correct answers for this group of nurses and physicians. The chi-square test was used to determine the p value, where $p < 0.05$ is considered a statistically significant difference between the two groups.

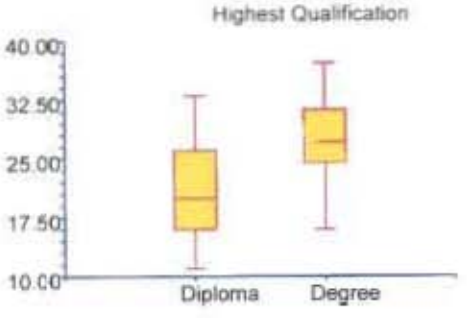
Table 1: Demographic data

	N (100)
Profession	
Nurses	76
Physicians	20
Pharmacists	4
Highest qualification	
Student	3
Diploma	58
Bachelors	34
Other	5
Practice setting	
State hospital	72
Hospice	7
Private practice	19
Other	2
Clinical area	
Medical	14
Oncology	67
Other	18
Gender	
Female	89
Male	11
Average age	38,06 (23-56 years)
20-30 years	13
30-40 years	24
40-50 years	23
50-60 years	15
Average years experience	14.12 (1-34 years)
Cancer visits	
Never see cancer patients	1
Seldom see cancer patients	20
Often see cancer patients	78

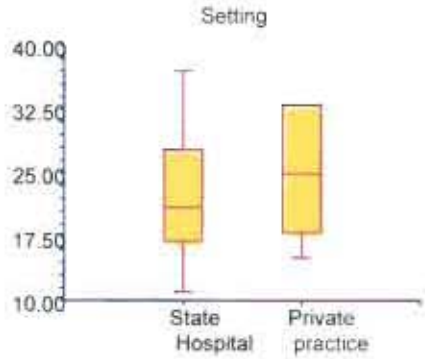
The physicians scored better in the overall score for the 37 questions as compared to the nurses. Lebovits[4] reported a similar outcome whereas the study by Furstenberg found nurses to be most knowledgeable.[26] Comparison however could be inaccurate due to the different measurement instruments used in these studies. Also South Africa has eleven official languages with no single one common to all [39], there may have been difficulty with the wording and language of the survey as it was only administered in English. The survey did not assess participant comprehension therefore question bias can not be excluded. The physicians scored poorly in questions relating to non-drug interventions (Question 7) and the pharmacokinetics of opioids (Question 11). This has also been reported in other studies, however not limited to physicians.[1,26,37] Physicians and nurses obtained poor scores in the questions related to pain assessment (Question 36), both groups also felt that patients over report pain (Question 34). This is consistent with most other studies.[1,3,4,25,26] The nurses scored poorly in questions related to equianalgesic doses of opioids (Question 9) side effects of opioids (Question 28) and non-drug interventions (Question 7 & 22). Similar results have also been reported in other studies.[3,4,15,25,38] Poor results for these issues has also been reported for physicians.

Table 3 shows the summary of the average correct scores relative to highest qualification, practice setting, clinical area of practice, years of experience and age. Results were analysed for each of the five variables by analysis of variance (ANOVA) but because of the lack of equal distribution among the categories of each variable, complete and detailed comparisons were impossible.

It was not possible to come to a conclusion regarding highest qualification, or practise setting due to the unequal distribution using ANOVA, therefore the two sample t-test was used to determine a possible difference between two more evenly distributed variables. It appears from the study that healthcare professionals with higher qualifications have better knowledge and attitudes towards cancer pain management. ($p = 0.000006$) Figure 1:



Healthcare professionals practising in a private setting (p = 0.005) and in the clinical area of medicine (p = 0.015) also appear to have better scores than those in the state hospital settings. Figure 2:



Healthcare professionals with less than fifteen years of experience seemed to achieve better scores than those with more than fifteen years of experience. (p = 0.025) This may be an indication of better education regarding pain management in recent years. Scores did not however differ by age group. One would have expected that the scores would indeed differ by age group, in that older participants would fare worse being the group with presumably the most years experience. Figure 3:

The findings of this study should be interpreted cautiously due to the possible sampling bias as well as limitations of the survey measure. The small sample size and uneven distribution of healthcare professionals made it difficult to detect differences in the different parameters.

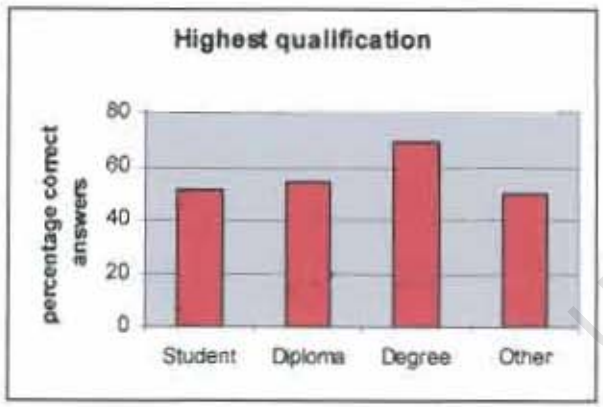
	Table 2: Summary of correct scores	Nurses	%	Physicians	%	P value
Q1	Observable changes in vital signs must be relied upon to verify a patient's statement that he has severe pain	25	33	15	75	0.0007
Q2	Because of an underdeveloped neurological system, children under 2 years of age have decreased pain sensitivity	41	54	17	85	0.01
Q3	If the patient can be distracted from his pain this usually means that he does NOT have high pain intensity	56	74	18	90	0.12
Q4	Patients may sleep in spite of severe pain	19	25	18	90	0.0000
Q5	Comparable stimuli in different people produce the same intensity of pain	60	79	19	95	0.08
Q6	Aspirin and other non steroidal anti-inflammatory agents are NOT effective analgesics for bone pain caused by metastases	40	53	14	70	0.16
Q7	Non-drug interventions are very effective for mild-moderate pain control but are rarely helpful for more severe pain	23	30	6	30	0.98
Q8	Respiratory depression rarely occurs in patients who have been receiving opioids over a period of months	46	61	17	85	0.04
Q9	Aspirin 650mg PO is approximately equal in analgesic effect to meperidine (pethidine 50mg PO)	22	29	9	45	0.17
Q10	The World Health Organization pain ladder suggests using single analgesic agents rather than combining classes of drugs	53	70	16	80	0.36
Q11	The usual duration of action of meperidine (pethidine) IM is 4-5 hours	16	21	5	25	0.70
Q12	Research shows that promethazime (phenergan) is a reliable potentiator of opioid analgesics	32	42	8	40	0.87
Q13	Patients with a history of substance abuse should not be given opioids for pain because they are at a high risk for repeated addiction	43	57	15	75	0.13
Q14	Beyond a certain dosage of morphine increases in dosage will NOT increase pain relief	52	68	14	70	0.89
Q15	Elderly patients cannot tolerate opioids for pain relief	57	75	19	95	0.05
Q16	The patient with pain should be encouraged to endure as much pain as possible before resorting to a pain relief measure	68	89	20	100	0.13
Q17	Children less than 11 years cannot report pain with reliability	54	71	18	90	0.08
Q18	Based on one's religious beliefs a patient may think that pain and suffering is necessary	50	66	19	95	0.009
Q19	After the initial recommended dose of opioid analgesic, subsequent doses are adjusted in accordance with the individual patient's response	69	94	20	100	0.16
Q20	The patient should be advised to use non-drug techniques alone rather that concurrently with pain medication	55	72	20	100	0.16
Q21	Giving patients sterile water by injection (placebo) is often a useful test to determine if the pain is real	37	49	15	75	0.04
Q22	In order to be effective, heat and cold should only be applied to the painful area	23	30	13	65	0.004
Q23	The recommended route of administration of opioid analgesics to patients with prolonged cancer-related pain is	59	78	17	85	0.47
Q24	The recommended route of administration of opioid analgesics to patients with brief, severe pain of sudden onset	25	33	12	60	0.03

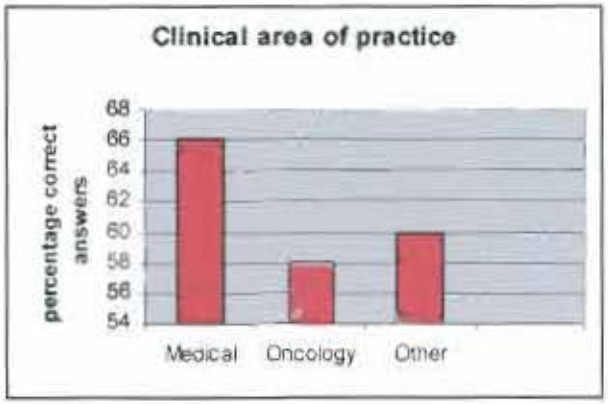
Q25	Which is the drug of choice for the treatment of prolonged moderate to severe pain for cancer patients	72	95	18	90	0.44
Q26	Morphine equivalent doses	38	50	16	80	0.02
Q27	Analgesics for post-operative pain	60	79	18	90	0.26
Q28	Incidence of respiratory depression	23	30	13	65	0.004
Q29	Timing of analgesic doses for cancer pain	69	91	17	85	0.45
Q30	Explanation for why a patient with pain would request increased doses of pain medication	67	88	20	100	0.12
Q31	Useful drugs in the management of cancer pain	51	67	14	70	0.81
Q32	The most accurate judge of the intensity of the patient's pain	65	86	20	100	0.07
Q33	Cultural considerations in caring for patients in pain	60	79	18	90	0.29
Q34	What do you think is the percent of patients who over report the amount of pain they have	14	18	1	5	0.14
Q35	Opioid addiction	34	45	16	80	0.005
Q36a	Assessment of pain No 1	21	28	7	35	0.52
Q36b	Management of case No1	17	22	5	25	0.80
Q37a	Assessment of pain No 2	33	43	16	80	0.004
Q37b	Management of case No 2	35	46	13	65	0.13
		22.86	58.61	28.38	72.77	

P < 0.05 Statistically significant

Table 3: Summary of average scores for qualification, practice setting, clinical area, years of experience and age

Highest Qualification	Score	Practice Setting	Score	Clinical Area	Score	Years of experience	Score	Age	Score
Student	20	State Hospital	23	Medical	26	< 15 years	24	20 – 30 years	24
Diploma	21	Hospice	23	Oncology	23	> 15 years	22	30 – 40 years	22
Bachelors degree	28	Private Practice	28	Other	24			40 – 50 years	23
Other	20	Other	20					50 – 60 years	22
P = 0.000006		P = 0.005		P = 0.015		P = 0.025		P = 0.56	





DISCUSSION

The current study examined the knowledge of and attitudes toward cancer pain management of a sample of physicians and nurses caring for cancer patients at the Pretoria Academic Hospital and Mary Potter Oncology Centre.

This was a convenience sample of nurses and physicians working with cancer patients. An anonymous survey was distributed and participation in the study was voluntary, with completion and submission of the survey taken as implying consent. The survey was only available in English, thus language or comprehension issues may have affected the outcome, as South Africa has many diverse cultures with many different languages. The response rate to this survey was 57.2%, which appears to be an average response rate for healthcare professionals, although impacts the value of the study due to non-response bias. No attempt was made to encourage return of the surveys and the non-participants were not evaluated in any way.

The overall correct score of 66% reflects some knowledge deficiencies regarding currently accepted principles of cancer pain management practice, as well as beliefs that could interfere with optimal care. This appears to be consistent with other studies.

Some healthcare professionals appeared confused about appropriate methods for assessing pain, particularly about the value of patient reports of pain intensity. Of concern is that most respondents appeared to suspect that a high percentage of patients over report pain, although one of the most basic principles of pain assessment is realising that pain is subjective and accepting the patients report of pain. It seemed that some lacked adequate knowledge of the fundamental facts of opioid pharmacology, including choice of drug, routes of administration and dosing schedule. Issues relating to drug tolerance, side effects and addiction in particular appeared not to be well understood. The role of non-drug interventions for the management of cancer pain also seems unclear. These results appear to be consistent with reports from other countries.

Conflicting results have been reported in the literature on whether physicians or nurses have greater knowledge regarding cancer pain management, however many different tools have been used to evaluate knowledge and this does not allow for

direct comparison. In this sample of healthcare professionals it appeared that the physicians scored better overall compared to the nurses scores. Any difference would perhaps imply different education programs, with emphasis on different aspects of pain management, however this was not evaluated. Healthcare professionals with higher qualifications appeared to have better scores than those with lower qualifications. Private practice and healthcare professionals in the clinical area of medicine also appeared to have improved scores. It is possible that the private sector has more access to education programs and different resources, thereby having a better score. Age of the professionals did not seem to have an impact on the scores, however the more years of experience the poorer the score. This may be due to improved education in pain management in recent years.

The findings of this study should be interpreted cautiously due to the possible sampling bias as well as limitations of the survey measure. The small sample size and uneven distribution of healthcare professionals made it difficult to detect differences in the different parameters.

The results of this study, however appear to be generally consistent with results from other studies of physicians and nurses in terms of knowledge of and attitudes towards cancer pain management. [4,26,27]

The study indicates a continuing need for education programs in the area of cancer pain management. Educational programs should focus on convincing all healthcare professionals involved in caring for patients with cancer that treatment of cancer pain is an important healthcare goal that requires their personal commitment and involvement.

CONCLUSIONS

The results of this survey reflect some knowledge deficiencies regarding currently accepted principles of cancer pain management, as well as beliefs that could interfere with optimal care. Few studies have been published regarding cancer pain management in South Africa, and this small study may indicate the need for more thorough investigation into knowledge deficits and attitudes toward cancer pain management. The study also reflects a continuing need for education programs in the area of cancer pain management.

RECOMMENDATIONS

Further research is needed in the management of cancer pain in South Africa. The impact of cultural differences on the perception and management of pain needs to be explored more fully, both amongst the healthcare professionals and their patients.

Education programs should be initiated in all healthcare professionals training. Emphasis should be placed on the correct assessment and management of pain. The greatest deficiencies found in this study, appeared to be in the appropriate assessment of pain and fundamental concepts of opioid pharmacology, including choice of drug, routes of administration and dosing schedule. The role of non-drug interventions needs to be emphasised particularly in resource poor countries such as South Africa. Continued medical education should be encouraged with regular attention to pain management.

The effect of these education programs should be regularly assessed by the training institutions, to ensure correct and appropriate attitudes and knowledge towards the management of cancer pain.

APPENDIX I

MANAGEMENT OF CANCER PAIN: KNOWLEDGE AND ATTITUDES OF HEALTHCARE PROFESSIONALS.

The attached survey has been distributed to healthcare professionals who see or treat cancer patients. The aim of this survey is to assess knowledge and attitudes of healthcare professionals towards the management of cancer pain.

All information will be presented in summary form and no individual will be identified.

Completion of this survey is voluntary and will take about ten minutes.

Thank you for your cooperation.

☐ Yes, I agree to complete this survey

☐ No, I do not agree to complete this survey

By filling in this questionnaire I consent voluntarily to complete this survey and understand that the survey is intended for research purposes.

APPENDIX II

Survey – Optional – Anonymous

- **General Information about You**

Professional	Highest qualification	Practice setting	Clinical area
___Nursing	___Student	___State Hospital	___Medical
___Pharmacy	___Diploma	___Hospice	___Oncology
___Medicine	___Bachelors	___Private Practice	___Other
___Other	___Other	___Other	Specify_____
Specify_____	Specify_____	Specify_____	

Years experience as health professional: _____ Age: _____ Gender: _____

Do you see cancer patients

_____ Never _____ Seldom _____ Often

True / False – Circle the correct answer

T F 1. Observable changes in vital signs must be relied upon to verify a patient's statement that he has severe pain
T F 2. Because of an underdeveloped neurological system, children under 2 years of age have decreased pain sensitivity and limited memory of painful experiences
T F 3. If the patient can be distracted from his pain this usually means that he does NOT have high pain intensity
T F 4. Patients may sleep in spite of severe pain
T F 5. Comparable stimuli in different people produce the same intensity of pain
T F 6. Aspirin and other non steroidal anti-inflammatory agents are NOT effective analgesics for bone pain caused by metastases
T F 7. Non-drug interventions (e.g. heat, music, imagery, etc.) are very effective for mild-moderate pain control but are rarely helpful for more severe pain
T F 8. Respiratory depression rarely occurs in patients who have been receiving opioids over a period of months
T F 9. Aspirin 650mg PO is approximately equal in analgesic effect to meperidine (pethidine 50mg PO)
T F 10. The World Health Organization pain ladder suggests using single analgesic agents rather than combining classes of drugs (e.g. combining an opioid with a non-steroidal agent)
T F 11. The usual duration of action of meperidine (pethidine) IM is 4-5 hours
T F 12. Research shows that promethazime (phenergan) is a reliable potentiator of opioid analgesics
T F 13. Patients with a history of substance abuse should not be given opioids for pain because they are at a high risk for repeated addiction
T F 14. Beyond a certain dosage of morphine increases in dosage will NOT increase pain relief

T F 15. Elderly patients cannot tolerate opioids for pain relief
T F 16. The patient with pain should be encouraged to endure as much pain as possible before resorting to a pain relief measure
T F 17. Children less than 11 years cannot report pain with reliability and therefore, the nurse should rely on the parents' assessment of the child's pain intensity
T F 18. Based on one's religious beliefs a patient may think that pain and suffering is necessary
T F 19. After the initial recommended dose of opioid analgesic, subsequent doses are adjusted in accordance with the individual patient's response
T F 20. The patient should be advised to use non-drug techniques alone rather that concurrently with pain medication
T F 21. Giving patients sterile water by injection (placebo) is often a useful test to determine if the pain is real
T F 22. In order to be effective, heat and cold should only be applied to the painful area

Multiple Choice – Circle the correct answer

23. The recommended route of administration of opioid analgesics to patients with prolonged cancer-related pain is
    a. intravenous
    b. intramuscular
    c. subcutaneous
    d. oral
    e. rectal
    f. I don't know

24. The recommended route of administration of opioid analgesics to patients with brief, severe pain of sudden onset, e.g. trauma or postoperative pain, is
    a. intravenous
    b. intramuscular
    c. subcutaneous
    d. oral
    e. rectal
    f. I don't know

25. Which of the following analgesic medications is considered the drug of choice for the treatment of prolonged moderate to severe pain for cancer patients
    a. Brompton's cocktail
    b. Codeine
    c. Morphine
    d. Meperidine (pethidine)
    e. Methadone
    f. I don't know

26. Which of the following IV doses of morphine administered over a 4 hour period would be equivalent to 30mg of oral morphine given q4 hours

a. Morphine 5mg IV
b. Morphine 10mg IV
c. Morphine 30mg IM
d. Morphine 60mg IV

27. Analgesics for post-operative pain should initially be given

a. Around the clock on a fixed schedule
b. Only when the patient asks for the medication
c. Only when the nurse determines that the patient has moderate or greater discomfort

28. A patient with chronic cancer pain has been receiving daily opioid analgesics for 2 months. The dose increased during this period. Yesterday the patient was receiving morphine 200mg/hour intravenously. Today he has been receiving 250mg/hr intravenously for 3 hours. The likelihood of the patient developing clinically significant respiratory depression is

a. Less than 1%
b. 1 – 10%
c. 11 – 20%
d. 21 – 40%
e. >40%

29. Analgesia for chronic cancer pain should be given

a. Around the clock on a fixed schedule
b. Only when the patient asks for the medication
c. Only when the nurse determines that the patient has moderate or greater discomfort

30. The most likely explanation for why a patient with pain would request increased doses of pain medication is

a. The patient is experiencing increased pain
b. The patient is experiencing increased anxiety or depression
c. The patient is requesting more staff attention
d. The patient's requests are related to addiction

31. Which of the following drugs are useful for the treatment of cancer pain?

a. Ibuprofen (Brufen)
b. Methadane (Physeptone)
c. Amitriptyline (Tryptanol)
d. All of the above

32. The most accurate judge of the intensity of the patient's pain is

a. the treating physician
b. the patient's primary nurse
c. the patient
d. the pharmacist
e. the patient's spouse or family

33. Which of the following describes the best approach for cultural considerations in caring for patients in pain:

a. Because of the diverse and mixed cultures there are no longer cultural influences on the pain experience

b. Nurses should use knowledge that has defined clearly the influence of pain on culture (e.g. Asian patients are generally stoic, Italians are expressive and exaggerate their pain, etc.)

c. Patients should be individually assessed to determine cultural influences on pain

34. What do you think is the percent of patients who over report the amount of pain they have? Circle the correct answer

0 10 20 30 40 50 60 70 80 90 100%

35. Narcotic/opioid addiction is defined as psychological dependence accompanied by overwhelming concern with obtaining and using narcotics for psychic effect, not for medical reasons. It may occur with or without the physiological changes of tolerance to analgesia and physical dependence (withdrawal).

Using this definition, how likely is it that opioid addiction will occur as a result if treating pain with opioid analgesics? Circle the number closest to what you consider the correct answer.

<1-5% 25% 50% 75% 100%

Case studies

Two patient case studies are presented. For each patient you are asked to make decisions about pain and medication

Directions : Please select one answer for each question

36. Patient A : Andrew is 25 years old and this is his first day following abdominal surgery. As you enter his room, he smiles at you and continues talking and joking with his visitor. Your assessment reveals the following information: BP = 120/80; HR = 80; R = 18; on a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort) he rates his pain as 8.

On the patient's record you must mark his pain on the scale below. Circle the number that represents your assessment of Andrew's pain.

0 1 2 3 4 5 6 7 8 9 10

No pain/discomfort Worst pain/discomfort

Your assessment, above, is made two hours after he received morphine 2mg IV. Half hourly pain ratings following the injection ranged from 6 to 8 and he has no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2 as an acceptable level of pain relief. His physician's order for analgesia is "morphine IV 1-3mg q1hr PRN pain relief". Check the action you will take at this time

a. Administer no morphine at this time
b. Administer morphine 1mg IV now
c. Administer morphine 2mg IV now
d. Administer morphine 3mg IV now

37. Patient B : Robert is 25 years old and this is his first day following abdominal surgery. As you enter his room, he is lying quietly in bed and grimaces as he turns in bed. Your assessment reveals the following information: BP = 120/80; HR = 80; R = 18; on a scale of 0 to 10 (0=no pain/discomfort) he rates his pain as 8.

On the patient's record you must mark his pain on the scale below. Circle the number that represents your assessment of Robert's pain

0 1 2 3 4 5 6 7 8 9 10

No pain/discomfort Worst pain/discomfort

Your assessment, above, is made two hours after he received morphine 2mg IV. Half hourly pain ratings following the injection ranged from 6 to 8 and he has no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2 as an acceptable level of pain relief. His physician's order for analgesia is "morphine IV 1-3mg q1hr PRN pain relief". Check the action you will take at this time

a. Administer no morphine at this time
b. Administer morphine 1mg IV now
c. Administer morphine 2mg IV now
d. Administer morphine 3mg IV now

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