

**FACULTY OF PAIN MEDICINE
AUSTRALIAN AND NEW ZEALAND COLLEGE OF ANAESTHETISTS
ABN 82 055 042 852**

EXAMINATION HELD ON 24th to 26th NOVEMBER 2010

**at St Vincent's Hospital
Melbourne, Victoria.**

THIS REPORT IS PREPARED TO PROVIDE CANDIDATES AND SUPERVISORS OF TRAINING WITH INFORMATION ABOUT THIS EXAMINATION AND TO ASSIST WITH PREPARATION FOR FUTURE EXAMINATIONS. ANSWERS PROVIDED ARE NOT MODEL ANSWERS BUT GUIDES TO WHAT MIGHT BE COVERED. SOME ANSWERS CONTAIN MORE INFORMATION THAN COULD BE COVERED IN THE FIFTEEN MINUTES, BUT HAVE BEEN INCLUDED AS A TEACHING AID. THE ANSWERS PROVIDED ARE CONSIDERED CURRENT, BUT MAY BE SUBJECT TO CHANGE IN THE FUTURE.

CANDIDATES SHOULD DISCUSS THE REPORT WITH THEIR TUTORS SO THAT THEY MAY PREPARE APPROPRIATELY FOR FUTURE EXAMINATIONS.

The Examination is an integral part of the Pain Medicine Training Program, leading to the award of Fellowship of the Faculty of Pain Medicine.

The Objectives of Training guide the range of content, which may be assessed.

The Examination consists of written and oral sections and covers the theory and practice of Pain Medicine.

In 2010, 20 candidates presented for the examination and 16 were successful.

EXAMINATION	PASS RATE	80%
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WRITTEN SECTION (See Appendix A for guides to question answers)
The following are the questions.

WRITTEN SECTION	PASS RATE 18/20	90%
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General information:

Always, candidates need to:

1. Plan their answer so that it flows and they appear to have an organised approach.
2. *Answer the question.*
3. Give succinct answers and not repeat yourselves.
4. Use headings and dot points if asked to discuss the answers briefly.
5. Give definitions if asked to discuss some aspect. (e.g. personality and personality disorders or breakthrough analgesia) Do not assume examiners know what you understand by a term.
6. Apply more commonsense thinking when answering the questions.
7. Start answer with "I would do..." if asked to "outline your approach".

The following are the questions. The first five questions were compulsory.

Question 1 – Compulsory

PASS RATE 16/20 80%

A 35 year old male is referred for management of diffuse limb and truncal pain. He has HIV infection with CD4 count of 450 cells per mm³ and undetectable viral load. List possible causes for the pain.

What investigations would be of value in determining the cause?

This question was generally well answered but some lists of possible causes were brief.

Question 2 - Compulsory

PASS RATE 12/20 60%

Outline the risk factors involved with the evolution from acute to persistent postoperative pain.

Describe possible preventative strategies with reference to the available evidence.

This was thought to be a 'core' knowledge question.

The candidates had a reasonable understanding of the risk factors underlying progression from acute to chronic pain.

However their understanding of possible strategies that have demonstrated efficacy and their knowledge of evidence for these strategies was generally poor.

The issue is core knowledge for a Specialist Pain Medicine Physician because many patients identify a surgical procedure as the precipitant for their pain problem.

Question 3 – Compulsory

PASS RATE 7/20 35%

Describe the physiological mechanisms of opioid-induced gastrointestinal side effects.

This question was generally poorly done. It is repeated from a previously set question. However, one candidate scored 9/10.

The subject has been covered in detail in recent major publications.

Question 4 - Compulsory

PASS RATE 16/20 80%

How has functional brain imaging influenced our understanding of anatomical pathways involved in pain?

Provide two examples to support your discussion.

This question was generally adequately answered and it was clear that the candidates read the question well. Most candidates had read or studied aspects of this subject and most were aware of the work of Dr Irene Tracey.

There was a reasonable approach by the majority of candidates. Clearly, it was impossible to give a comprehensive review of the subject in the time allocated.

There was a marked variation in the examples chosen but all were relevant

This question could appear again in another guise (perhaps asking for more detail in one specific area or asking in a more focused manner). It serves as a discriminator question.

Question 5 – Compulsory

PASS RATE 16/20 80 %

20% of people in Australia and New Zealand experience chronic pain. What goals would you consider to improve access to timely and appropriate pain management in your region?

It was expected that this question would be well performed following the Pain Summit earlier this year.

Question 6 - Non Compulsory

PASS RATE 2/3 67 %

Mr Smith, whom you are about to interview for the first time, asks if he can bring his wife and 2 primary school aged children into the interview as well.

Please discuss the advantages and disadvantages of including 'significant others' in the initial interview.

Attempted by 3 candidates

Question 7 – Non Compulsory

PASS RATE 16/17 94 %

Inappropriate use of prescription opioids is reported to be increasing.

How can you limit this in your practice?

Attempted by 17 candidates

Question 8 – Non Compulsory

PASS RATE 4/9 44 %

Discuss the current evidence for the use of gabapentinoids in acute perioperative pain patients.

Attempted by 9 candidates

Both examiners considered that this question was answered with insufficient specific information. (Too much padding)

Question 9 - Non Compulsory

PASS RATE 11/13 85 %

Melvin Becks is a 54 year old plasterer who fell from a ladder 6 months ago and sustained an undisplaced fracture of his left tibial plateau. He is complaining of increasing tiredness after using slow release morphine 400mg per day and ibuprofen plus codeine 8 daily since then for persisting knee pain.

Describe the possible causes of his tiredness.

Attempted by 13 candidates

Question 10 – Non Compulsory

PASS RATE 6/7 86 %

Provide a classification of incident pain in cancer patients.

Describe the management approaches for each.

Attempted by 7 candidates

This question demonstrated some difficulty in answering due to the inconsistencies in the literature. It was recognized that candidates had different classifications and approaches to management. If there was a description and classification that could be corroborated, marks were awarded.

Question 11 - Non Compulsory

PASS RATE 9/12 75 %

Mrs Beryl Toohey is referred for management of severe acute exacerbation of chronic central abdominal pain radiating to the back. Her investigations identified a multiloculated pancreatic cyst and her amylase was 2500 units per Litre.

Outline your recommendations for immediate and long term management.

Attempted by 12 candidates

Patient's age not given but assumed middle aged.

Very few candidates mentioned visceral hyperalgesia as an important cause of chronic pancreatic pain.

Few candidates discussed the role of stenting in the acute phase.

A longer discussion on the role of regional blocks in the acute pancreatic sufferer was required.

Question 12 - Non Compulsory

PASS RATE 2/4 50 %

Your physiotherapist has just resigned from your clinic and there is a hospital wide freeze on the appointment of new staff.

Write a letter to the CEO justifying reemployment of a physiotherapist within your multidisciplinary group program.

Attempted by 4 candidates

This question addressed issues of leadership within a Pain Medicine department.

The examiners identified the following domains to be considered:

- * Justify Multidisciplinary Pain Medicine as important*
- * Justify physiotherapist as key member of the team*
- * Outline clinical duties of physiotherapist*
- * Other contributions by physiotherapist to teaching, QI, research*
- * Vital for accreditation by Faculty*

Plus:

- * Quality and persuasiveness of the argument overall*

Question 13 – Non Compulsory

PASS RATE 14/20 70 %

What are the methods available to prevent the evolution to and severity of Post Herpetic Neuralgia?

Attempted by 20 candidates

This question was re-set from the previous year. The topic is frequently discussed.

Pass rate was better than last year but still disappointing.

Question 14 - Non Compulsory

PASS RATE 3/4 75%

A boy of 12 years who has been missing school regularly presented with a history of chest pain, for which 12 specialists could not find the cause. His father was in jail, his mother was anxious. How would you manage this?

Attempted by 4 candidates

This question focussed on psychosocial issues but was interpreted biomedically.

Question 15 – Non Compulsory

PASS RATE 9/11 82 %

A family asks about euthanasia for their 78 year old mother who has severe upper lumbar and pelvic pain and lethargy related to wide spread metastatic colon cancer.

Describe your approach to this patient's management near the end of life.

Attempted by 11 candidates

General comments on written paper:

- Some answers were difficult to read. Some candidates wrote very little, but gave the impression that they had more to say – perhaps they ran out of time.
- There was a degree of generic answering & some repetitiveness in answers.
- It is important to remind candidates to read the question carefully.

LONG CASES

PASS RATE 12/20 60%

General comments and observations:

Supervisors of Training are reminded they need to sign off that candidates have done *five observed long cases under exam conditions* prior to presenting to the examination.

As the long case mirrors a first consultation within a pain clinic, we believe the Long Case should be retained as part of the Examination.

Marks are given equally for History, Examination, Presentation of findings in a logical manner, and a Management plan.

History:

The candidates and the patients are both advised to ignore the examiners.

Aim is to establish rapport with the patient.

An outline of “How to take a Pain History” is available in the booklet, Acute Pain Management: Scientific Evidence. 3rd Edition, 2010 (Macintyre et al (Eds))

Candidates all have access to the Pain Orientated Physical Examination (POPE) DVD.

Candidates need to practice long cases under exam conditions as time management is essential.

Candidates should:

- Routinely ask all patients about *pertinent negatives*-red/yellow flag safety issues and *present these as part of their long case summaries*.
- Start with open-ended questions, ensuring that history taking is patient centred.
- Listen to the patient. Patients give important clues, which at times are missed by the candidates.
- Demonstrate empathy and sensitivity. (Recall this interaction is being observed.) Attention to the psychosocial history was good in some cases.
- In the long case (and also at the communication station), Candidates should avoid closed questions.

Physical Examination:

Candidates should ensure that they give appropriate time to examining the main area / systems affected by the pain, and consider examining this first.

Check handedness, apply comparative symmetry in examination, map out areas of allodynia and look for extra *clinical clues* such as medical alert bracelets.

Candidates should spend a couple of minutes only on examination of the systems NOT involved in the main area of symptoms.

Candidates need to assess pain, function, co morbidity and underlying disease. Remember pain may not be the major issue, but more disability or psychological dysfunction.

Presentation should be structured and the discussion objective. In presenting conclusions, candidates should consider:

- An initial brief summary of the most pertinent data.
- Their analysis of this, reflecting their judgement regarding the priorities and relevance of issues.
- Considered in relation to predisposing, precipitating, perpetuating and aggravating factors.
- Candidates and examiners need to be aware of the concept of the *fatal error* in discussion of management.
- Management in accordance with the above.
- A sophisticated experienced candidate will present this information in less than seven minutes, even with a complex scenario, making use of the concepts outlined above, without needing to use the above terms.
- It is acceptable to indicate in your summary that there was particular information that you would have liked to obtain but did not. (Remember in real life we all may forget, and obtain the information at subsequent consultations.)

Examiners need evidence that the candidate has the ability to be the leader of the Pain Team, and to manage the long case as if they were their own patient.

Candidates are expected to finish their summary with a (biopsychosocial) diagnostic formulation and outline a management plan.

Needs to be an emphasis on an **all round approach** to assessment, diagnosis, formulation, management and prognosis.

Remember the patients who agree to be involved in the exam will be a reasonably select group. They will, as a rule, be “more than willing to please”. Candidates should use this advantage, and follow up on any clues given.

Candidates should expect questions on:

- Mechanisms.
- What to do if pain progresses.
- What are the main pathophysiological issues?
- What are the main patient related issues?
- What are the main management issues?

Candidates need to look beyond the current management and ask what else could be offered. Do not assume because the patient has been to a Pain Clinic all that is possible has been done. Also do not assume the treatment that has been done so far is “best practice”. Be prepared to critically discuss the patients’ current management and what you may do that is different from the plan the patient has described.

This year, long case patients were well chosen:-

Mrs HH F 64 Sarcoma related hip and hemi- pelvis resection. Sciatic nerve injury neuropathic pain.

Ms JM	F 51	Severe hyperalgesia – compensation issues
Ms LH	F 38	Disc prolapse – surgery – residual signs & neuropathic pain. Self harm in area of sensory loss.
Mr AC	M 40	Seronegative arthropathy. Groin and scrotal gangrene. Seizures with tramadol.
Mr RG	M 59	Neuropathic pain secondary to syringomyelia
Ms JH	F 63	CRPS left wrist: work issues
Mr PA	M 43	Multiple leg operations and radiotherapy for recurrent squamous cell carcinoma. Eventual right hindquarter amputation. Persisting neuropathic pain and high opioid use but returning to work
Mr BG	M 47	Broncho- pleural fistula: chest wall pain and deformity
Ms CR	F 41	CRPS following ankle sprain – ankle fusion, spinal pump
Mr KR	M 60	Chronic knee pain, loose bodies in joint. High opioid use: recent bereavement: intolerance to oral opioid for breakthrough pain
Mr PB	M 31	Pelvic tumour – post-op pain
Ms FT	F 60	Chronic back and leg pain
Ms CO	F 45	Chronic back & leg pain post-fusion operation with workplace and social issues
Ms JJ	F 33	Renal pain and headache
Ms EG	F 70	Ulcerative colitis, arthritis, renal calculi, chronic abdominal pain, main issue is arthritis pain
Mr PK	M 55	Abdominal, back and leg pain

Overall, candidates used the interview and examination hour reasonably well. However, candidates tended not to take a short forensic history. A brief review of unpalatable history items such as intravenous drug usage, self harm, suicide attempts, incarceration need to be part of the comprehensive history.

Perhaps SOTs could advise about tactics for this issue.

*There is a need to stress detail in **physical examination**.*

Some candidates waited until 10 minutes warning before commencing their physical examination.

*The pain physical examination needs to be **thorough and comprehensive**.*

This year only 1 candidate did a physical examination limited to just one area (like a short case).

Mental State Examination:

Some candidates did not attempt any form of mental state examination when the case warranted assessment.

A MSE is usually necessary even in a brief form.

“Pertinent negatives” (important safety issues): Candidates frequently failed to ask or report specifically about weight loss, fever, night sweats, cancer history, renal function, peptic ulcer disease, seizure history, sleep apnoea, driving/occupational safety and self harm risk.

Candidates should look for and report other ‘clinical clues’: this year, candidates missed:

- medical alert bracelets,
- *packs of cigarettes and asthma puffers in pockets*
- *hearing aids*
- *magnetic necklaces*
- *scars*
- *IVDU track marks*
- **hand dominance**
- *compare sides (in a systematic fashion)*
- *map out areas of allodynia on examination*

Good candidates will pick these up.

Candidates should outline a differential diagnosis where appropriate.

STRUCTURED VIVA SECTION

PASS RATE 20/20 100%

The viva section consists of three structured vivas and the investigation station.

General information:

- Candidates should expect questions on:
 - Nature of the lesion.
 - Anatomy.
 - Investigations to confirm your diagnosis.
 - Possible therapies for current pain.

The introductions to the structured vivas were as follows:

Acute scenario

PASS RATE 17/20 85%

The *Acute Scenario* asked candidates to cope with a patient in distress. Candidates need to be able to explain to the examiners, as they would to patients, what they mean by the terms they use.

Case details:

A 25 year old man currently taking 24mgs sublingual buprenorphine (Subutex®) each day for treatment of his heroin addiction is admitted following a motor-scooter accident. He requires a mid-forearm amputation. He expresses concerns about how his pain will be managed and whether he could become addicted again.

You are asked for your advice about analgesic options in the perioperative period and what strategies might be employed to minimise the development of chronic post-amputation pain.

Question 1: What analgesic options and preventive strategies would you suggest?

Other questions relate to:

- *patient history*
- *pre & intra-operative pain relief*

Question 2: How would you answer the patients concerns about the risk of becoming addicted again?

Question 3: Ten days later the patient is comfortable – still taking his buprenorphine as well as 20 mg oral immediate-release oxycodone every 3-4 hours (about 120 mg a day). The surgeons suddenly announce that he can go home tomorrow. What will you advise?

Key points:

The risk of addiction could be split into –

- *pain management issues close to hospital discharge*
- *what is the risk of a patient on short-acting opioids and Subutex developing drug seeking behaviour? (A – high)*
- *do you agree that risk of addiction in this population of acute pain patients is low?*
- *What is the legal situation*

The additional information related to question three might be provided as a note for the candidate to read as well.

Issue: *candidates need to carefully read the question and accurately address what the instructions require.*

The fatal (and semi fatal) error: *eg fatal opioid dosing errors, sending patient with mechanical valve for an MRI, rhizotomies on a warfarinised patient (each of these issues were noted in the structured vivas)- they may automatically score a fail if candidates don't recognise their mistake with reasonable prompting by the examiner.*

Chronic scenario

PASS RATE 19/20 95%

Case details:

A 53 year old woman has severe, persistent localised left maxillary pain radiating to the cheek and ear. She has had root canal therapy, three teeth removed and sinus surgery. She was told her pain would not respond to standard neuralgia treatment. She was referred for your assessment and told that you might be able to provide a stimulator.

Q1: What else would you like to know before stating your differential diagnosis?

Q 2: What is your differential diagnosis? “Likely neuropathic”

Q 3: Investigations have been done and there is no underlying treatable cause.

Q 4: What are your possible management options?

Q 5: Would you consider using a stimulator in this person? “Little evidence”

Supplementary questions

Q 6: Is surgical referral appropriate

Q 7: Could this be migraine?

This section was generally well done and most candidates gave an appropriate differential diagnosis.

Cancer scenario

PASS RATE 15/20 75%

Case details:

A 37 year old woman with metastatic adenocarcinoma of unknown primary is admitted with worsening pain in multiple sites.

Nine months ago she presented with pyelonephritis, bilateral ureteric obstruction and a pelvic tumour mass. Obstruction was relieved with stents but on biopsy the primary cancer was undetermined.

She has completed chemotherapy with cisplatin and paclitaxel (Taxol).

Investigations indicate cancer spread to the left ischium, upper and mid thoracic vertebral bodies and the sternum. She has burning pain in her left thigh, back pain and aching in the left arm where there are some mild sensory changes but no other neurological deficit.

The bladder and bowel are functioning. She is underweight. She has poor appetite and mild nausea.

She is taking controlled release morphine (MSContin) 50 mg bd. She dislikes the sedative effects of the morphine and other drugs. She is using meditation and aromatherapy as adjuncts.

She has a supportive partner and is keenly requesting to return to her home.

Question 1: What further assessment options would you consider?

Question 2: What is your management of the potential problems?

Expect the candidate to indicate:

Standard approach to pain management including:

- *Adjunctive medication: steroids? NSAIDS? Membrane stabilisers? Ketamine? Anti-depressant?*
- *Importance of talking with the patient and her family, find out their expectations/ educate them about options*
- *Liaise with oncology and radiotherapy re tumour therapy options*
- *Addressing psychosocial and spiritual issues in deciding options*
- *This is a common scenario but difficult to manage, and varies with each patient*
- *Consideration of nerve blocks and Intrathecal drug therapy.*

Part 2

The patient is treated effectively with intrathecal analgesics and goes home. She is readmitted 6 weeks later. Pain has worsened.

She has nausea and itch, low urine output and cachexia. She is distressed and agitated and can hardly walk due to weakness and widespread pain. Her mother and partner plead with you to “do something to relieve her pain and suffering”.

Describe your management.

In the Cancer Viva the most obvious weakness in candidates was focussing on pharmacotherapy alone for management. Those who performed poorly lost marks for inadequate emphasis, even absence of comment on the psychological emotional and spiritual aspects of a terminally ill young patient.

There may be insufficient exposure to cancer pain and palliative care in training for many of the candidates to understand this, and adapt their management.

For some candidates, serious errors of dose calculation were made for opioid and other adjunct medication doses.

In the future, 2 part Viva scenarios such as this will have part 2 available as printed text as well as explanation from the examiner.

Investigation Station

PASS RATE 18/20 90 %

Specific examples:

- MR scans with metastatic disease
- MRI osteoporotic crush fractures (most candidates did not differentiate between new and old lesions)
- Neurophysiology findings
- MR scan-spinal canal stenosis
- Abnormal biochemical profile.
- Skull base neoplasm – most candidates did not differentiate between intra-and extra axial lesions.

General information

- Generally well performed
- Most candidates appear to attend regular x-ray meetings. (e.g. Weekly)
- Candidates should use general knowledge.
- If there is an obvious diagnosis, mention it as soon as possible.

This year, most candidates had confidence in interpreting X-rays etc Experienced candidates moved quickly through this section and did extremely well. But some candidates were slow to say what they knew and to move on.

Note: trigeminal neuralgia by definition has normal neurological examination but trigeminal nerve damage (trigeminal neuropathy) has abnormal clinical examination.

SHORT CASES with patients:

PASS RATE 18/20 90 %

General Information:

The Short Case section involved 6 patients - each candidate is exposed to 3.

- At each station information was provided outside the station door.
- Candidates have 10 minutes and were directed to a specific area to examine or to impart information.
- This section is a test of physical examination techniques or communication skills.
- Candidates need exposure to neurologists and rehabilitation specialists as part of their training.

This year's cases included:

Acute:

Mr AT M 43 Crohn's disease, ilio-colic resection and ileostomy, high opioid use

Ms MH F 67 total knee replacement re-operation /lymphoedema/rheumatoid arthritis- Day 2 post-op

Cancer:

Mr OO & M 57 neck pain post radiotherapy for carcinoma of tonsil. ? Tracheal fistula thoracotomy pain

Ms CR F 60 post mastectomy pain

Chronic:

Ms JK F 44 MS: postherpetic neuralgia – back and leg – sensory examination

Mr MH M 54 peripheral neuropathy: vasculitis: ankle reconstruction

The examiners considered that the short case patients were particularly well chosen and matched for signs and examination. It is understood by the examiners that short case patients are often brought to the exam at short notice with incompletely settled pain.

This year, candidates tended not to read instructions carefully or to address the specific issues.

Some candidates were prepared to prescribe medication without knowing the prior medication history.

Some candidates didn't tailor treatment to the particular patient.

All candidates had areas of strength and some weaknesses. Standards were generally better than previous years.

Cancer short case – (breast lumpectomy – post radiotherapy plus painful shoulder)

Better Candidates: looked, asked questions first about where and what sort of pain, numbness or sensitivity & what is your dominant hand. – – Then they began to examine

Poorer Candidates: began instant examination, asked questions as they went and frequently forgot or were confused about the answers. Only 3/10 were confident about the thoracic/upper arm/shoulder dermatomes and myotomes.

Communication Station:

PASS RATE 14/20 70%

General information:

- This station involves an actor and addresses communication skills. The candidate should not delve too much into the history. The history given should be all that is required.
- The aim of this station is to encourage a generalised discussion of why suggested options are preferable. Informed consent may be required.
- Details of the history, and the treatment plans are not necessary.

This year's case details:

You are a Specialist Pain Medicine Physician in a multidisciplinary unit.

You are reviewing Mr Evans; a 38yo disabled Storeman, for the first time on behalf of his usual doctor.

Mr Evans has been managed by the Unit since a lifting injury at work 2.5 years ago. He has had detailed, appropriate evaluation and treatments, with surgery not indicated.

He had partial improvement with a Pain Management Programme. He lives independently, but has not returned to work or his usual bushwalking.

He continues with physiotherapy, home exercise, regular simple analgesia and relaxation. He has ceased several opioids because of adverse effects, especially sedation.

He has persistent lumbar pain, without leg pain, diagnosed as degenerative. The insurer has denied further liability.

He wants to discuss the advantages and disadvantages of commencing civil litigation for compensation for his personal injuries.

General Background

Patients are usually very naïve with respect to the processes, and the effects of being involved in the process of civil litigation. The issues include

- unrealistic expectations with respect to the time required to complete the legal action (often many years),
- the adversarial style, during which their expectations, beliefs, trust, integrity and good will are often challenged,
- conflicting expert opinion, almost inevitably with at least minor inaccuracies
- enduring uncertainty
- unusual use of terminology
- the potential for their involvement to result in their lives, recovery and rehabilitation to be slowed, delayed and put 'on hold' because information required for important long reaching 'life' decisions depends upon the outcome eg How much they can afford for different accommodation, therapies etc
- final financial awards are usually less than expected, especially after deduction of legal costs.
- professional opinions about these matters are divided, and the approaches to medico-legal assessment is variable
- a negative bias often develops in response to patients involved in a legal action.

The task for the actor is to be responsive to the Candidate/ Specialist Pain Medicine Physician, once they have been presented with the scenario.

i.e. ***To discuss with the patient the advantages and disadvantages of commencing civil litigation for compensation for his personal injuries.***

Issues to be raised by 'patient' /actor

- Statute of limitations:
- Relationship between Pain and Injury:
- Relationship between Impairment and Disability:
- Malingering:
- Independence of Experts:

- Legal Process:
- Effects of the Litigation Process:
- Expectations:

Some candidates failed to introduce themselves and are focused on the examiners in the room.

Only one candidate said goodbye acknowledging the 'patient'.

Several candidates wished to repeat history taking and assessment when this is a communication station where the skill and ability of talking, providing exploration and establishing rapport (talk is a layman's term not medical jargon). Some candidates appeared not to have absorbed the vignette's details and several required prompting to discuss the pros and cons of entering the litigation process by the actor (which was the lead-in statement).

OVERALL EXAMINATION COMMENTS:

Generally, candidates performed well in Structured Vivas, Short Cases, Investigation and Communication stations. It is evident that a focus on training in these areas has been achieved.

This year, there was a disappointing response in the long cases which probably relates to difficulties in prioritising and in recognising the mixed components of patients' problems. However, candidates do appear to show empathy and understanding. Marks were given for candidates recognising patients' sensitivities.

The Specialist Pain Medicine Physician is part of a team, but the Pain Medicine Specialist needs to be able to lead the team.

Be aware of what other members of the team can do and critically discuss their roles.

Candidates may irritate painful areas in pain patients. This is recognised by examiners and adjustments are made.

Short case patients are often in discomfort and have been selected for the examination at relatively short notice. The examiners are aware of the limitations that a brief short case scenario.

Candidates need to know when it is appropriate to probe and when not to, in both history and physical examination.

Patients are usually asked what they felt about the exam. This year they were generally impressed with all aspects of the examination process. They specifically commented on the empathy demonstrated by the candidates.

Special thanks must be given to Dr Jane Trinca and her staff at St Vincent's Hospital for their efforts in organising the patients and the exam venue.

The examination committee is grateful for the assistance of Prof. David Scott – Observer for ANZCA for his oversight of the various sections of the examination this year.

THE BARBARA WALKER PRIZE

The Barbara Walker prize is awarded to the leading candidate provided the total mark is above 70%.

This year the prize was awarded to Dr Rebecca Martin, NSW.

Merit Certificates were awarded to Drs Nicholas Christelis (VIC) and Frank Thomas (NZ)

RAY GARRICK



**Chairman
Court of Examiners**

Distribution:
Faculty Board
Court of Examiners

MEREDITH CRAIGIE



Deputy Chair

Supervisors of Training
Registered Trainees

December 2010

Examination Committee
ANZCA Director of Education

APPENDIX A

Question 1 - Compulsory

A 35 year old male is referred for management of diffuse limb and truncal pain. He has HIV infection with CD4 count of 450 cells per mm³ and undetectable viral load. List possible causes for the pain.

What investigations would be of value in determining the cause?

A comprehensive medical evaluation is essential.

- This should include review of neurological, endocrine, musculoskeletal, cardiovascular, respiratory, gastrointestinal and genitourinary systems as well as patients HIV treatment status (past and present ARTs).
- Consultation with HIV/AIDS specialist would also be helpful.
- Current CD4 count is borderline low normal and the undetectable viral load suggest continuing treatment.

Patients with HIV and on treatment are at risk of both HIV-related and non-HIV related diseases. These are caused either by the disease process or the treatment (ART) or both. Low CD4 count during long term ART treatment is a predictor of non-AIDs related events such as cardiovascular, renal, liver diseases and cancer.

Possible causes & investigations:

1. Distal sensory polyneuropathy.

Manifest usually as a symmetric, mainly distal and sensory with minimal motor involvement. Includes peripheral neuropathic symptoms, decreased (or absent) ankle reflexes, decreased distal sensation, altered sensitivity to light tactile or thermal stimuli, diminished vibration sense, distal muscle weakness (or atrophy) and abnormal electromyography and nerve conduction studies.

- Confirmed by concordant clinical signs and NCS.
- NCS survey large-diameter afferent nerve fibres and if atypical features such as motor involvement is present, need to assess for other causes such as a demyelinating polyneuropathy.
- QST helpful in quantifying small fibre sensory modalities such as abnormal thermal thresholds.

The cause of the polyneuropathy could be caused by indirect neurotoxicity from the HIV virus via immune proteins, direct neurotoxicity of HIV proteins (Glycoprotein gp 120) or could be an acute toxic neuropathy from ART drugs. It may be difficult to ascertain the precise mechanism of neuropathy but a temporal relationship to introduction of the drugs may be suggestive.

Need to exclude other causes of neuropathy:

- Diabetes,
- Vit B12 deficiency,
- thyroid disease
- paraproteinaemia-

Investigations: fasting blood glucose, serum Vit B12, thyroid function test and serum protein IEPG.

(ii) Drug toxicity – antiretroviral exposures, isoniazid or cytotoxic chemotherapy, megadoses of vitamins (e.g. pyridoxine) and alcohol use. Alcohol abuse may be common in patients with HIV. Gamma GT and macrocytosis in LFT and FBC may be indicative of heavy alcohol use.

2. Bone diseases – osteoporosis and osteopenia.

Truncal pain may be related to nociception arising from the bone such as osteoporotic crush fracture.

Exclude by plain X-rays of spine and/or bone scan.

Osteopenia can also cause a vague general pain in the back. Assessment of osteoporosis is best undertaken with a bone densitometry.

Other potential source of pain from bone structures include:

- (i) pathological fracture. Plain X-rays, bone scanning and MRI scan of the vertebral spine if clinical suspicion arise.
- (ii) osteomyelitis / discitis. Inflammatory markers may be obtained from WCC, ESR or CRP and if infection is suspected, culture of the specimen may yield diagnosis. Mantoux and culture for AFB is TB suspected.

3. Cancer screen

HIV infection increases risk of Kaposi's sarcoma, non-Hodgkin's lymphoma and other cancers (lung, skin, prostate, anal). A metastatic spread to spine (vertebral bodies) or lower limbs can be determined from x-rays or MRI scanning if there are clinical suspicions.

4. Cardiovascular cause

- Pain could be related to peripheral vascular disease (arterial obstruction from aneurysm, atheroma) may account for truncal and lower limb pain.
- Signs of peripheral vascular disease sought e.g. pulses, bruits at the aorta, iliac and femoral vessels. If suspected, then Doppler ultrasound and or angiography may be indicated.
- Rarely, cerebral infarction due to cardiovascular disease (hypertension, peripheral vascular disease) -- suggest this should be screened clinically and if indicated, a scan of the brain to confirm diagnosis should be undertaken.

5. Spinal cord injury – due to destructive lesions

This could occur from any space occupying lesion in the spinal canal – from crush fractures with retropulsed segments into spinal canal, epidural abscess (from immune compromise) or epidural haematomas. Screen clinically and if indicated MRI scan of the thoracolumbar spine.

6. Other causes such as intestinal disease, liver and renal disease.

Whilst not likely to cause lower limb pain which may be related to other causes, they can contribute to abdominal, flank or truncal pain and needs to be ruled out clinically.

7. Should opioid medications especially high doses used, consideration should be given to the possibility of this being an opioid induced hyperalgesic state. The particular characteristic could include new onset pain with neuropathic features in a diverse distribution and made worse by increase in opioid dosage.

8. It is also important to ascertain the psychosocial status of the patient to determine the level of psychological distress, affective state (concomitant anxiety, depression), existential issues, coping strategies and social support amongst others.

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Question 2 - Compulsory

Outline the risk factors involved with the evolution from acute to persistent postoperative pain.

Describe possible preventative strategies with reference to the available evidence.

Introduction

Every chronic pain was once acute. Normally acute surgical pain declines over the first few days after surgery, but in some instances the pain can persist. The pain-related pathology then becomes independent of the initiating disease process. Chronic postoperative pain can become an intolerable chronic pain condition after 1 of every 100 operations, irrespective of type of surgery. (1) In general, chronic postsurgical pain (CPSP) has been defined as pathological pain that persists for longer than 2 months post-surgery. (2)

General Risk Factors

Surgical, psychosocial, socio-environmental and patient-related factors (3) and the known polymorphisms in human genes are involved in perpetuating the pain. Altered pain sensitivity in the average population has been associated with frequent variants in the micro-opioid receptor gene (OPRM1), catechol-O-methyltransferase gene (COMT), guanosine triphosphate cyclohydrolase 1/dopa-responsive dystonia gene (GCH1), transient receptor potential cation channel, subfamily V, member 1 gene (TRPV1) and the melanocortin-1 receptor gene (MC1R). (4) Genetic polymorphisms in 5-HTTLPR (encodes serotonin transporters) (5) are associated with migraine, burning mouth syndrome, irritable bowel syndrome, and fibromyalgia.

Preoperative risk factors for developing persistent post surgical pain:

Preoperative risk factors include being of the female gender, younger age, pain before surgery, preoperative chronic pain, preoperative anxiety, fear and depression, and low income, as well as low self-rated health and lack of education. Greater preoperative catastrophising, (6,7) and fear of surgery (8) have been associated with the development of CPSP.

Intra-operative risk factors for developing persistent post surgical pain

Intra-operative risk factors that are associated with an increased likelihood of developing chronic post surgical pain include: (5) site (e.g. thoracotomy, sternotomy, mastectomy, major limb amputation); extent of surgery, and incision type (open versus laparoscopic approach); (9) increased duration of surgery; (10) low (compared to high) volume surgical unit; (11) pericostal (versus intracostal) stitches, and; intra-operative nerve damage. (9)

Postoperative risk factors for developing persistent post surgical pain

Postoperative risk factors include unrelieved pain, severe pain, high postoperative use of analgesics (over 7 days after surgery), surgery performed in a previously injured area and re-operations. Social and environmental factors such as solicitous responding from significant others and social support (12) can add to this. (13)

Prevention

Pain is regarded as the fifth vital sign, and its intensity should be recorded on patients' observation charts. The prevention of nerve and tissue damage during surgery is probably the most important preventive factor. (13) Traction, stretching, and excessive or prolonged pressure on nerves during surgery should be avoided. The least painful surgical approach (e.g. keyhole surgery) with acceptable exposure should be used.

Highly effective multimodal treatment administered for as long as the surgical stimulus (inflammatory response) continues after the operation will reduce the incidence and severity of chronic post surgical pain.(14)

Early improved outcomes are achieved by reducing opioid-related side effects. To do this, clinicians need to use rational multimodal analgesic drug combinations (e.g. NSAIDs, cyclooxygenase-2 inhibitors, paracetamol, gabapentanoids, clonidine, ketamine, and local and regional anaesthetic techniques) that are supplemented by opioid analgesics on an as needed basis.

In surgery with high risks of neuropathic pain, the preventative use of gabapentin and pregabalin may be considered. An optimal procedure-specific analgesic regimen (see PROSPECT Web site: www.postoppain.org) should be integrated into an enhanced recovery care program. An enhanced recovery care program allows for early oral feeding, mobilisation, and adjustments in other principles of surgical care (e.g. drains, catheters, tubes, and monitoring) consistent with the existing evidence in the peer-reviewed literature.(15,16) Simple and more rational approaches of pain relief directed toward the periphery (that is the surgical wound and surrounding tissues) may offer the greatest promise for advancing acute postoperative pain management. (17). There is evidence for specific local anaesthetic techniques in selected surgeries (see marking guide) (18)

Perioperative psychological pain management programs should be developed to help prevent and treat post surgical pain. Knowledge of genetic factors may increase the ability of clinicians to identify high and low pain responders before surgery or specific genotypes that may influence the pharmacokinetics of analgesics.

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Question 3 – Compulsory

Describe the physiological mechanisms of opioid-induced gastrointestinal side effects.

Discussion of the physiological mechanisms related to opioid-induced gastrointestinal side effects need to include those related to:

- nausea and vomiting,
- bowel dysfunction, and
- other effects – gastric emptying, lower oesophageal sphincter tone, sphincter of Oddi

1. OPIOID-INDUCED NAUSEA AND VOMITING

Nausea and vomiting (N & V) are common side effects of treatment with opioid analgesics. The severity of N & V can often be very distressing for patients leading to reduced quality of life, non-compliance and limitations to the adequacy of analgesia that can be obtained from this class of drugs.

Mechanisms

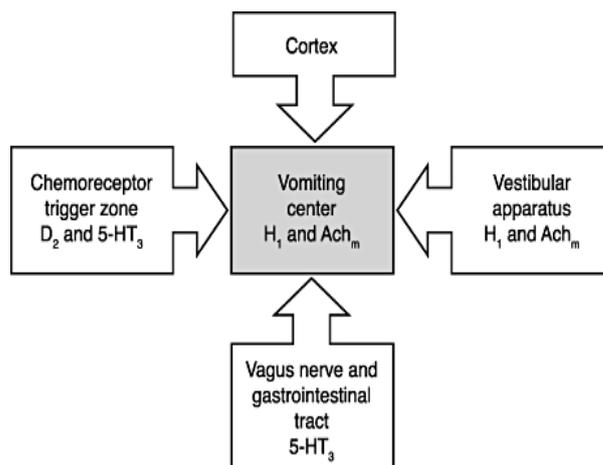


Figure. Sensory input into the “vomiting center” of the brain. D2 = D2 dopaminergic; 5-HT3 = serotonin type 3; H₁ = histamine type 1; Ach_m = muscarinic acetylcholine

The vomiting centre, situated in the medulla oblongata, consists of groups of loosely organised neurones that mediate both sensory and motor control of nausea and vomiting. These neurones are stimulated or suppressed via chemoreceptors present in the vomiting centre. Input to the vomiting centre comes from 4 main areas:

1. the chemoreceptor trigger zone (CTZ) – for vomiting in particular
2. the gastrointestinal tract
3. the vestibular apparatus
4. the cerebral cortex

Opioids exert emetogenic effects in a rather complex manner, mostly via the first 3 mechanisms. They are mediated via interaction with mu, delta and kappa opioid receptors in the brain, spinal cord and peripherally.

CTZ

The blood-brain barrier at the CTZ is not complete and this permeability means that it can be stimulated directly by many drugs that are present in the systemic circulation, including opioids. Opioid stimulation of the CTZ occurs via mu and delta receptors and, from there signalling to the vomiting centre occurs via dopamine D2 as well as serotonin (5HT3) receptors present in the CTZ. This mechanism is subject to the development of tolerance with repetitive opioid administration.

GI tract

Central and peripheral opioid receptors are involved in inhibiting gut motility. Activation of peripheral mu opioid receptors appears to be the predominant mechanism leading to decreased GI transit via effects in the circular and longitudinal muscles involved in peristalsis.

Inhibition of gut motility leads to gut distension, increased emptying time and constipation resulting in stimulation of visceral mechanoreceptors and chemoreceptors. Subsequent signalling to the vomiting centre is via serotonergic pathways.

See more detail in Section 2 below.

Vestibular apparatus

The vestibular apparatus is located in the bony labyrinth of the temporal lobe. Most opioids stimulate the vestibular apparatus directly but the actual mechanism is not definitely known. Sensory input from here to the vomiting centre is through histaminergic H₁ and muscarinic cholinergic ACh_m pathways. Thus, rapid movement and dehydration can stimulate nausea; and emesis is more likely in ambulant patients.

The relationship between opioid use and the incidence of V & V is complex. The emetogenic effect of a particular opioid may depend, for example, on that drug's particular specificity for mu, delta or kappa opioid receptors (kappa opioid agonists may cause less N & V). However, other factors that affect the incidence of emesis include inter-patient variation in these mechanisms including gender and age; variations in individual patients with time; route of opioid administration; and the development of tolerance to the CTZ-mediated effects.

2. OPIOID-INDUCED BOWEL DYSFUNCTION (OBD)

GI tract innervation

The GI tract is innervated by the enteric nervous system composed of the myenteric plexus, located between circular and longitudinal smooth muscle layers of the bowel (these muscles propel GI contents distally by peristalsis), and the submucosal plexus, located in the submucosa. The movements of the smooth muscles are controlled by the enteric nervous system with input from the autonomic nervous system. Enteric neurons also synthesise opioid peptides and their transmitters.

Role of endogenous opioids

While there is evidence of involvement of mu opioid receptors at the central and spinal levels, opioids inhibit GI transit primarily from direct action on opioid receptors within the GI tract with little contribution from central effects. Endogenous opioids (e.g. met-enkephalin, leu-enkephalin, b-endorphin and dynorphin) are present in the GI tract, localised to both neurons and endocrine cells of the mucosa. Endogenous opioids inhibit enteric nerve activity and inhibit both propulsive motor and secretory activities.

Role of opioid receptors

Delta, kappa and mu opioid receptors mediate the effects of both endogenous and exogenous opioids on bowel function and are located in the enteric nervous system. Of these three receptor classes, the enteric mu-opioid receptor appears to be the principal mediator of opioid effects on the GI tract.

When opioid agonists bind to these receptors, the release of excitatory and inhibitory neurotransmitters is inhibited. This interrupts the co-ordinated rhythmic contractions required for intestinal motility and also reduces mucosal secretions. Administration of exogenous opioids can cause OBD by decreasing peristalsis, which in combination with reduced secretions into the gut and increased reabsorption of fluid from the gut (as the stool remains in the intestinal lumen for extended periods) leads to the formation of dry, hard stools that are difficult to pass.

Other effects

Gastric emptying is also delayed and lower oesophageal sphincter tone is reduced, increasing the probability of reflux. Spasm of the sphincter of Oddi may occur.

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Question 4: Compulsory

How has functional brain imaging influenced our understanding of anatomical pathways involved in pain?

Provide two examples to support your discussion.

Answer Outline:

Introduction:

There is good evidence that cerebral blood flow changes reflect variations in local synaptic activity as measured by PET. This dramatic change in blood flow during neuronal activity is utilized by fMR. More specifically fMRI signal alterations occur with changes in the ratio of oxygenated to deoxygenated haemoglobin. This is termed the Blood Oxygenation Level Dependant (BOLD). Therefore, **fMRI indirectly measures only the flow of oxygenated blood in the brain.**

Various techniques have been used to map cortical activity including PET, fMRI, magnetoencephalography, (MEG) electroencephalography EEG and optical imaging. Despite its short temporal resolution its high spatial resolution makes fMRI the most used technique. In contrast to PET, fMRI requires no exogenous radioactive isotopes and is totally non invasive. The various methodologies can be combined to assess cortical function in anticipation of pain and in perception of pain in various pain disorders.

This has resulted in significantly better understanding of nociceptive processing in the human central nervous system in the non-injured and injured state, as well as modulation of pain perception via pharmacological and psychological interventions.

The main advantages to fMRI as a technique to image brain activity related to a specific task or sensory process include:

- The signal does not require injections of radioactive isotopes,
- The total scan time required can be very short, i.e., on the order of 1.5 to 2.0 min per run. (PET requires injection of radioactive isotopes, multiple acquisitions, and, therefore, extended imaging times.
- The expected resolution of PET images is much larger than the usual fMRI pixel size.
- PET usually requires that multiple individual brain images are combined in order to obtain a reliable signal. Consequently, information on a single patient is compromised and limited to a finite number of imaging sessions.)

Initial experiments, performed in the early 1990s demonstrated that pain was not processed in a single cortical area, but in several distributed brain regions. Over the last 10 years, functional MRI has produced a clearer picture of the medial and lateral pain systems and techniques have been validated to supply reliable correlative neuroanatomical data.

Rather than pain primarily being represented in the primary sensory cortex a large distributed network was active during painful stimulation. Subcortical structures were also involved in the activation such as the anterior cingulate cortex, the insula, the frontal cortex and the amygdala. These are often referred to as the pain matrix.

Further studies with PET and fMRI suggests that these structures can be subdivided into the medial and lateral pain system., based on the projections from the medial and lateral thalamic structures to the cortex.

- The lateral pain system is thought to be more involved in the location and intensity of the painful stimulus.

- The medial and anterior cingulate cortex are more involved with the cognitive evaluative component of pain.
- The insula encodes both laterality and perception, non painful stimuli and also affective pain processing thus facilitating integration of information from both the medial and lateral systems.
- Chronic pain: There is a significant fractional reduction in the amplitude of the pain-related response in the insular cortex contralateral to a pain stimulus, as well as in the ipsilateral insular cortex, and the anterior cingulate cortex. Some studies demonstrate that opioids and other drugs can reduce the anterior cingulate cortical response to pain.

Normal subjects: Cortical activation patterns may be evoked by the illusion of cool & warm, noxious cold & noxious heat stimuli. The thermal grill illusion produces activation in the anterior cingulate cortex, whereas its component warm and cool stimuli do not. Thus, increased activity in the anterior cingulate cortex is selectively associated with the perception of thermal pain.

When normal subjects are distracted during pain stimulus, brain areas associated with the affective division of the anterior cingulate cortex and orbitofrontal regions show increased activation. At the same time, traditional areas of the pain of matrix (i.e. thalamus, insula and cognitive division of the anterior cingulate cortex have reduced activity).

- Functional MRI identifies that the ability to change pain intensity is via the brainstem descending modulatory network with its pro- and antinociceptive components.
- The medial thalamic nuclei show increased activation in response to painful stimulation. Increased populations of nociceptive neurones develop in the medial intra-laminar thalamus in chronic pain.
- Nuclei such as the rostral ventromedial medulla and periaqueductal gray (PAG) are able to both inhibit and facilitate the nociceptive response.
- There is evidence that the hippocampus is involved in pain processing: there is activation when attention is focused on pain.

Significant activation occurs in regions consistent with the PAG, nucleus cuneiformis (NCF), ventral tegmental area/substantia nigra, parabrachial nuclei/ locus ceruleus, and red nuclei are bilaterally to painful electrical stimuli applied to the abdominal wall and the rectum.

Right PAG activation may represent a greater nociceptive response and greater emotive modulation of visceral over somatic pain.

- The mid-cingulate region is activated in all pain studies where there is anticipation of pain.
- The anterior cingulate cortex appears to be selectively associated with the perception of thermal pain.
- Expectation of pain activates sites within the medial frontal lobe, insular cortex, and cerebellum distinct from, but close to, locations mediating the pain experience itself.

Specific examples:

- Functional MRI has revealed that chronic pain is largely processed in a different brain region than acute pain. Older adults who report more severe acute or chronic pain have smaller hippocampal volumes & lower levels of hippocampal N-acetylaspartate/creatine, a marker of neuronal integrity.
- CRPS --
 - thermal stimuli in CRPS evoked more prefrontal cortical activity than usually seen in healthy subjects, and this was reversed (became more similar in pattern to normal subjects' brain activity to thermal stimuli) after sympathetic blocks.
 - Significant alterations occur in the white matter, with corresponding shrinkage in the prefrontal neocortical gray matter. The changes are likely due to the pain itself, MRI studies find such changes reverse when the pain improves.
- Spontaneous pain in postherpetic neuropathy patients before and after local lignocaine treatment.
 - multiple prefrontal regions correlate to the changes in pain intensity, suggesting that the patients' brain regions underlying higher cognitive functions become more active as the pain intensity increases. This has bearing on C B T techniques. Generally, brain areas thought to be involved in sensory representation for pain are regions that are modulated acutely, whereas regions involved in emotional and reward pathways responded to longer-term treatment.
- In fibromyalgia, similar pressure stimuli produce no common regions of brain activation in patients compared with control subjects but fMRI response is noted in fibromyalgia patients. This supports the hypothesis that FM is characterized by cortical or subcortical augmentation of pain processing.
 - Cerebral SPECT scanning, (which evaluates rCBF over a period of 30 minutes), reveals diminished resting rCBF in bilateral thalamic and caudate nuclei in 10 patients with FM compared with 7 control subjects.
 - Attenuated thalamic rCBF was also demonstrated in 2 studies of fibromyalgia, 2 studies of neuropathic pain, and in a study of cancer pain.
 - Fibromyalgia patients treated with serotonin & noradrenaline reuptake inhibitors, (milnacipran) exhibited a reduction in pain sensitivity and a parallel increase in activity in brain regions implicated in the descending pain inhibitory pathways compared to placebo-treated patients
 - The putative role of the anterior cingulate cortex in processing pain unpleasantness suggests that the reduced response in fibromyalgia and other chronic pain states reflects an adaptive mechanism in which patients with chronic pain have become so accustomed to persistent pain that the brief, moderate-to-strong pain evoked in the experimental paradigm does not produce the emotional responses observed in those unaccustomed to such pain.
 - Summary: fMRI studies in fibromyalgia patients suggest that similar levels of subjective pain result in similar central nervous system (CNS) activation in both fibromyalgia patients and controls. however, for a similar stimulus, fibromyalgia patients have a greater subjective sensation of pain. This increased sensitivity is accompanied with a decreased

activity in brain regions implicated in the descending pain inhibitory pathways.

- Chronic back pain subjects displayed 5 to 11 percent less neocortical gray-matter volume than control subjects. This decrease is equivalent to the gray-matter volume lost in 10 to 20 years of normal aging. The decreased volume relates to pain duration, indicating a 1.3 cm³ loss of gray matter for every year of chronic pain,
 - In chronic back pain, the primary brain site involved in coding sustained spontaneous pain & strongly correlates with pain intensity is the medial prefrontal cortex. (In contrast, in PHN the main regions that are activated and respond most to long-term treatment are the amygdala & ventral striatum).

- Sympathetically maintained pain:

The cortical representation of sympathetically maintained pain involves specific and identifiable cortical activity, as well as does the relief of that pain achieved by a peripheral nerve block procedure.
- Post-stroke pain:

Disruption of thermosensory and pain integration may account for the central pain syndrome that can occur after stroke damage. Studies on patients who have suffered ischaemic stroke particularly in the posterior insula may alternatively experience loss of pain sensation, thermaesthesia and asybolia (or spontaneous pain dissociation) leading to central post stroke pain syndrome (CPSP). PET scanning and radiolabeling opioid receptors demonstrates reductions in opioid receptors binding in the posterior thalamus and posterior insula. The effect of opioids and other analgesic alter the areas of the brain that are affected by pain. This leads to the concept of the 'fMRI dose response curve'. This may in turn lead to the discovery of analgesic agents earlier in pharmacological investigation pathway and in a more targeted way.
- Opioid use and pain tolerance:

PET studies have demonstrated that both opioids and placebo affect the anterior cingulate cortex and the brain stem. An extension of this information through fMRI shows the potent effect of placebo changes and anticipation in the experience of pain. fMRI has given some basis to the self report of sensitivity or tolerance to pain. The changes in the primary sensory cortex, anterior cingulated cortex and pre-frontal cortex is more pronounced in the subjects who reported increased sensitivity to pain.
- Placebo analgesia results in decreased brain activity in pain-sensitive brain regions, including the thalamus, insula, and anterior cingulate cortex, and is associated with increased activity during anticipation of pain in the prefrontal cortex, providing evidence that placebos alter the experience of pain.

- **Psychological states**:
 - Empathy -- f MRI studies of pain empathy in children and adults, (the perception of other people in pain) was associated with increased haemodynamic activity in circuits involved in the processing of *first-hand experience of pain*, including the insula, somatosensory cortex, anterior mid-cingulate cortex, periaqueductal gray and supplementary motor area.

- Comparison of areas of the brain involved in the experience of pain and those involved in the empathic response to observing a loved one experiencing pain have been conducted using fMRI. Activity in the brain stem and anterior cingulate cortex correlated to individual empathy scores.
- Scanning subjects who are experiencing virtual social exclusion have demonstrated similar results to those of physical pain and correlates with self report of distress. This suggests that the definition of pain as ...'..an unpleasant sensory and emotional experience associated with actual or potential tissue damage.....' is a robust definition and that the subjective experience of pain may arise without peripheral nociceptive input and be centrally generated.
- Anxiety: Functional imaging of the brain has led to a better understanding of the role anxiety and anticipation has on the experience of pain: increased activity in the prefrontal and cingulate cortex occurs during distraction and decreases pain perception through a descending pain modulatory system. The medial brain regions are affected by distraction or hypervigilance to nociceptive input and influence descending inhibitory and facilitatory circuits. This revelation may be a target for pain modulation. Both PET and fMRI studies have been used to investigate whether anxiety induced increased pain perception produced the same generalized increase in brain activation as increased nociceptive input. This study demonstrated that the hippocampus was responsible for anxiety induced increase in pain perception. This may provide novel anatomical targets for therapies aimed at relieving anxiety- evoked pain.
- Anticipation: when subjects actively attend to their pain or anticipate pain the activity within the insula appears to move more rostral than during the pain itself. The rostral insula appears to be an interceptive or monitoring centre for a number of stimuli including pain and temperature.
- Major depression: fMRI shows a difference in both the processing and anticipation of pain in patients with major depressive disorder compared with non-depressed subjects & showed reduced activation in areas associated with modulating the pain experience, compared with healthy controls.

Depressed subjects had increased activation in the right anterior insular region, dorsal anterior cingulate, and right amygdala during anticipation of the painful vs. non-painful stimulation.

During the painful stimulus itself, there is increased activation in the right amygdala which was associated with greater levels of perceived helplessness.

They had decreased activation in the periaqueductal gray matter, the rostral anterior cingulate and the prefrontal cortices, (areas responsible for cortical and subcortical pain modulation), in depressed compared with non-depressed subjects. Depressed subjects showed a greater activation of the right amygdala during the anticipation of pain,

Conclusion:

Although functional anatomical imaging has not resulted in major clinical breakthrough in the treatment or management of pain they do serve to clarify some of the complexity of pain perception. It helps to bring together the physical, emotional psychological and reactions to pain. PET and fMRI may help to guide and more accurately target areas of the brain and more scientifically develop agent to treat persistent pain.

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This is a reasonably broad overview of where fMRI changes occur and what types of conditions will show modification of cortical activity as demonstrated by fMRI.

Question 5 – Compulsory

20% of people in Australia and New Zealand experience chronic pain. What goals would you consider to improve access to timely and appropriate pain management in your region?

Model Answer

Introduction

I would consider the goals as guided by the National and International Pain Summits 2010 with particular reference to issues relevant on a regional level

Overall Goal / Mission

To improve quality of life for people with pain and their families, and to minimise the burden of pain on individuals and the community.

Goal 1: Making pain a regional health priority

- Establish a regional co-ordinating body involving all stakeholders to identify partnerships, framework and resources required to build capacity and deliver the proposed outcomes of the National Pain Strategy
- De-stigmatise the predicament of people with chronic pain
- Achieve federal and state government recognition of chronic pain as a chronic disease in its own right

Goal 2: Knowledgeable, empowered and supported consumers and carers and others involved in managing pain (employers, legal practitioners, compensation bodies and government agencies)

- Improve community understanding of chronic pain and pain management
- Provide easily accessible information and support programs to assist people with pain and others to understand and be more pro-actively involved in managing pain.

Goal 3 : Skilled professionals and best practice evidence based care.

- Train and support health practitioners in best practice assessment and management
- Establish and promote systems and guidelines to ensure adequate management of chronic pain

Goal 4 : Access to interdisciplinary care at all levels

- Develop and evaluate patient centred care delivery and funding models for pain management in the community which provide interdisciplinary assessment care and support as part of comprehensive primary care centres and services. This will include appropriate support from hospital based services.
- Ensure good communication between practitioners and patients and between practitioners

Goal 5 : Quality Improvement and evaluation

- Measure outcomes, evaluate and feedback
- Ensure quality use of medicines for pain management in the community
- Improve systems to detect and manage unsanctioned use.
- Improve standards in pain management by developing benchmarking of outcomes. (E.g. emergency department presentations for chronic pain management issues would be relevant at a state level)

Goal 6 : Research

- Enable research at a regional and national level and identify information gaps underpinning the above goals

References

<http://www.health.nsw.gov.au/gmct/painmgmt/index.asp>

www.painsummit.org.au/strategy/Strategy-NPS

Question 6 - Non Compulsory

Mr Smith, whom you are about to interview for the first time, asks if he can bring his wife and 2 primary school aged children into the interview as well.

Please discuss the advantages and disadvantages of including 'significant others' in the initial interview.

Response.

NB The following is NOT intended to be an answer to the question.

It is intended to provide information that could be used to justify an answer, which would of necessity be brief, and focused on dealing with the immediate circumstances rather than an extended management of the associated factors.

This scenario is a common predicament in clinical practice, without there being only one definitive response supported by theory and outcome research. Pain Medicine Specialists manage with advanced skills, to assist the patient and to avoid complications. They can assess factors which have an impact on the course of the patient's disorder, and intervene to get the best outcomes.

In this situation it is necessary to focus on some of the 'social' factors of a pain patient's presentation.

There are many good reasons to interview others associated with the referred patient. These include

- A source for collateral information
- Assessment of the family (and others)
- Education of family (and others)
- Involvement of the partner in management (egg activity programmes, medication supervision, falls supervision, ongoing observations, dietary change)

Particular issues which present in the scenario above which require specific decisions by the Pain Medicine Specialist include

- It is an *initial* interview
- The difference between including another adult (Mrs Smith) and the young children. This includes the practical aspects (Who else will mind the children, if they are not included in the interview?), and the effect on the interview (the type of information provided, distractions, observation of parenting and family style in contrast with individual and couple interactions)
- How and where to come to an agreement about the conduct of the interview (waiting room, interview room?)
- The reasons for Mr Smith's request to include his wife and children
- The 'locus of control' during the interview – who is in control.

These issues present immediately and must be decided quickly. They must also be managed tactfully, politely, in a manner that is likely to assist one of the major early tasks of such an interview, to develop a good rapport and therapeutic alliance. This comes at a time of heightened expectations and sensitivity for the family, often with a sense of urgency, as the interview with the Pain Medicine Specialist may be seen by them as a potential turning point in their difficult situation. There can be a lot of pressure at this time.

Guiding principles include:

- The main priority is to get a good assessment of Mr Smith's condition (history and examination specifically re pain, its effects and treatment, effects on others, and other aspects of his life and circumstances, etc.).
- There is no single approach to assessment that has been established to be better than another, include who to initially interview.
- Understands the relevant issues related to interviewing Mr. Smith and his family is important
- Responsibility to be 'in control' of the assessment and treatment process remains with the Pain Medicine Specialist, with discretion to vary usual practice when this benefits the patient. This requires the interpersonal skills for working with people, and a broad based ('biopsychosocial') approach.
- Pain Medicine Specialists operate within the limits of their skills, in this case with respect to family assessment and intervention. They identify problems, they are able to manage simple issues, and refer to appropriate practitioners for further assistance when indicated.

Collateral Information.

A major benefit of obtaining information from someone who knows the patient well, and who has been in a position to observe changes since the onset of the painful condition, is to learn more of the patient's condition, their responses to it and to interventions, and to report the impact on others living with the patient. With phenomena such as pain, its perception and tolerance, mood and suffering, the patient's report of their subjective experience is very important but they cannot report other phenomena such as sleep patterns, posture, facial expression, attitudes, interactions with others, etc.

The congruence, or otherwise, between the information provided by each person can be very informative, and needs to be interpreted, for example in relation to insight, cooperation, priorities, relevance, sophistication, responsibility, relationship style and the extent of their involvement.

Family Assessment.

The quality of the support provided may be assessed, and its availability in the future. The domestic environment can vary from providing a major source of incentive and constructive assistance to a destructive, distracting influence on the patient and their recovery.

Usual lifestyle patterns (activity, personal habits, obesity, lifestyle skills, substance use, resilience) can be assessed. Other demands on family resources may become evident (health, financial, domestic, legal, other family members, friends, community obligations).

Aspects of family functioning include the style of communication, the management of daily functions (providing nutrition, accommodation, cleaning, clothing, education), problem solving styles, roles including with respect to authority, social interactions, protection, caring and development functions. Some aspects of these may become evident, even during an initial interview.

Education: establishing a Therapeutic Relationship with the family.

The most common reason for a request for the family to be included in the initial interview is concern for the patient and a wish to provide support.

This may occur after many past experiences of being rushed, without the opportunity to be heard, or without satisfactory explanations about issues which threaten their quality of life, and how they may best help.

This may lead to inappropriate and disruptive behaviours which prevent efficient assessment. The patient and their family may have become more assertive in response to previous disappointments with health services. This can challenge their ability to maintain a reasonable quality lifestyle, as well as test their judgment. People who have experienced serial adversities are over-represented among those presenting for help with their chronic pain, so Pain Medicine Specialists must be able to effectively manage sensitive situations with tact and diplomacy.

The management of unexpected and potentially difficult situations can be undertaken by using a graduated approach, from very simple and conservative to more complex.

A common approach is to simply request 'usual procedure'. This may be to initially interview Mr Smith individually, with an indication that his wife and family will be interviewed at another time (yet to be determined).

The family's response to this suggestion needs to be quickly assessed, to address any tension that may arise when their request (to initially be interviewed together) is declined. A brief explanation of the reason for the decision may be provided, in the waiting room. "I usually interview the person with the pain initially so that I can first understand what is happening from *their* point of view. I will be able to have a more useful discussion with your wife when I understand your situation better." Again sensitivity regarding their delay is required, with adjustments if need be.

Another common approach is to accept Mr Smith's offer to include his wife from the outset. This can be efficient, accomplishing a lot of the assessment quickly, though the risk of incomplete assessment is greater. Loss of control of the interview can arise because of

- Misunderstanding of the process eg Mrs Smith answering for Mr Smith
- Inhibition, with both reluctant to discuss sensitive issues (This can also occur if interviewed separately, especially if each does not explicitly support this approach.)
- Distraction to other issues
- Premature expectations of decisions and treatment recommendations
- Pressure on the Pain Medicine Specialist with inappropriate demands,

While these phenomena occur in individual interviews, an imbalance of power and influence is more likely in joint interviews because of the effect of Mr Smith and his wife (and perhaps the children) supporting each other, though not necessarily with good judgment.

The support can be very productive, encouraging each to report relevant information, a process which can be sensitive and painful. However, without good judgment, inappropriate behaviours may develop especially if there have been unfortunate experiences previously. In chronic, complex conditions, misunderstandings, and conflicting opinions and recommendations are common.

Rather than expecting to identify a single 'correct' approach, the Pain Medicine Specialist should employ an approach about which they are confident, which allows them to maintain a sense of control, with a level of tension that is easily tolerable, proceeding cautiously to deal with issues as they arise. Major problems are more likely to develop if the level of tension is allowed to escalate markedly, control of the interview is lost, and revision to regain control becomes necessary.

Particularly if tension arises, it is important to allow extra time to deal with the situation, including the option of additional appointments. A sense of urgency, from any participant, including from the Pain Medicine Specialist, can be very inflammatory.

Failing to deal with the tensions evident in the interview leaves the risk that these will continue, and that they will influence treatment outcomes and family functioning at home. Providing an opportunity for the family to meet the Pain Medicine Specialist, and to ask their questions, can relieve many uncertainties, and assists the development of a consistent supportive approach to management. This is more likely to result in effective use of resources, and better outcomes.

Interventions.

'No man is an island.' Families become important for support, incentive and purpose. Families can also be destructive influences, because of increased practical demands in very difficult situations, the extra personal demands following the onset of disability (eg change of status, role, self-image) as well as exacerbation of dysfunctional behaviours in response to increased stress.

Adjustment is required for the family as well as for the individual if unnecessary suffering is to be avoided. In many situations these adjustments have to be permanent, because of the significant losses of future expectations as a family, as well as for the individual.

Education of the family members about the condition, its effects and best management can improve the outcome for Mr Smith. Having the family included in the interview allows for the opportunities for this process to begin.

The concepts of Normal and Abnormal Illness Behaviour and Sick Role which have been well established, most readily apply to short term, physical disorders, especially those with conspicuous manifestations. Those with chronic pain disorders are disadvantaged because 'pain' does not satisfy these criteria, giving rise to much of the confusion and frustration. This is accentuated by the effects of culture and migration. Considerable trust, good will and good quality communication are required to avoid the complications of the higher risk. Unfortunately, those presenting for assistance with their chronic pain disorders more frequently have problems in regard to these skills because of the higher incidence of bad experiences in life. This situation indicates an increased need for family assessment and intervention for those with persistent pain. A lot of complications can be prevented by intervening to change unhelpful 'support' provide by well meaning but naïve families.

Particular issues for those with chronic pain that can impact upon families include:

- Physical dysfunction limiting family tasks (eg lifting and carrying), roles (eg providing income), relationships (marital, parental, social)
- Role model changes
- Mood change (depression, anxiety, irritability)
- Motivational difficulties, inappropriate secondary and tertiary gain
- Behaviour change (withdrawal, inactivity, violence, self-harm)
- Inappropriate substance use (prescribed, noncompliance, alcohol, illicit)
- Required changes in accommodation, transport, use of resources (with expenses of medical care)

Specific marital and family therapies may be indicated if the more conservative approach of education (self- education by reading, individual counselling, group education) is not sufficiently effective.

Special risks which should be evaluated, and which may require urgent intervention, include:

- Severe mood change
- Prolonged inactivity
- Inappropriate comforting behaviours (eating)
- Irritability, violence
- Substance abuse
- Suicidal, homicidal risk factors
- Separation, divorce risk
- Child abuse, neglect

These are often not drawn to the attention of the Pain Medicine Specialist, and may not be revealed even by specific enquiry of the individual patient. They will often only be revealed by a reasonably confident, appropriately assertive spouse with good judgment who is given access.

Children in Interviews.

There is no single acceptable approach, other than the requirement that the Pain Medicine Specialist understands what they are doing, and that they have a reasonable sense of control of the situation.

Positive reasons to include children in initial interviews include

- To quickly understand the family situation and style of functioning
- To observe the children, and possible effects of the changes on them
- To obtain information, including from the children
- To provide information, particularly in response to direct questions
- Convenience, if other supervision of the children is not available and the interview with Mrs Smith cannot be delayed

Reasons to not include the children:

- Priority is assessment of Mr Smith and his pain condition
- Distracting behaviour of the children
- Discussion of sensitive issues beyond the responsibility and comprehension of the children
- Use of the children to distract discussion from important issues
- Use of the children to exercise undue persuasive influence
- Mr Smith's communication, behaviour and emotional expression may be different, most likely inhibited, in the company of his children

Interviewing children requires specially developed skills to be effective, though a reasonable impression can be gained without advanced training, especially with some personal experience with children.

The age, stage of development of the children, and the family style will greatly influence decisions regarding the extent to which the children can helpfully be involved, though this is usually more feasible in subsequent interviews.

Question 7 – Non Compulsory

Inappropriate use of prescription opioids is reported to be increasing.

How can you limit this in your practice?

The use of opioids long term for chronic pain should only be considered once all other treatment options have been adequately trialled. The prescription should always be part of a multimodal treatment program and should not be considered as a uni-modal treatment.

The practitioner needs to have undertaken a comprehensive assessment of the patient addressing not only the physical elements of their presentation but also being aware of and addressing the psychosocial factors including beliefs, expectations and mood.

The initial prescription should be considered as a trial to see if the opioids do improve the patient's function and quality of life.

Discussion about the goals of a trial and an agreement of the steps to be taken if these goals are not met, need to be articulated prior to commencing the trial. The trial agreement may be a written "contract", or the result of a verbal discussion. However a record should be made in the patients file outlining the responsibilities of the patient and expectations of outcomes.

Pain specialists now realise some opioids are more "likable" and therefore these opioids may not be suitable for long-term use.

Pain specialists believe only long acting controlled release preparations are appropriate for chronic pain and patients need to be educated to manage "flare-ups" using non-pharmacological management including both physical and psychological strategies as appropriate.

When used long term opioids put the patient at risk of a number of long term side effects, including hormonal suppression leading to a number of effects including osteoporosis and fluid retention, immune suppression and potentially increasing pain (Opioid induced hyperalgesia). Studies also show opioids can cause central and sleep apnoea, especially if used in conjunction with other sedative type medication. These need to be discussed with the patient.

Patients should be warned about the risks of cognitive impairment and be advised not to drive or make important decisions when the doses are changing (increasing or decreasing), if the medication is being used with other sedative medication or alcohol or if the doses are considered high. Debate about appropriate ceiling doses has not been settled but once doses exceed 120mg morphine equivalence specialist advice should be sought.

Before prescribing the doctor should:

- Be aware of the regulatory requirements in the jurisdiction in which they practise.
- Know the patient well.
- Take a full history and examination.
 - Particularly looking for a past history of drug or substance misuse / abuse.

- Family history of drug / substance misuse.
- Review regularly, addressing outcomes:
 - Analgesia
 - Activity
 - Adverse effects
 - Affect
 - Aberrant behaviour.
- Explain opioids will only decrease pain by 30-50%.
- Opioids will only work in approximately 30-40%.
- The initial prescription is a trial.
 - So unless there are signs of improvement in pain and /or function there is no point in continuing.
 - Both the practitioner and the patient need to understand the expected outcomes that will see the prescription continued.
- The patient needs to understand there should be one prescriber (with appropriate backup) and ideally to obtain their prescriptions from one pharmacy
- Be aware of signs of abuse / misuse.
 - Asking for prescriptions early.
 - Reporting loss of prescriptions or medication
 - Being fixated on the opioids with demands for increasing doses, early scripts.
- Consider use of an opioid contract.
- Rules of engagement:
 - No early scripts.
 - Aim to see some improvement in function, quality of life.
 - Advice re safe storage / responsibility.

If the prescriber has any concerns about the patients appropriate use of the medication, consider doing random blood levels, urine screening and meticulously examining the patient for injection sites.

Reference:

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Question 8 – Non Compulsory

Discuss the current evidence for the use of gabapentinoids in acute perioperative pain patients.

Introduction

Postoperative pain is not purely nociceptive in nature, and may consist of inflammatory, neurogenic, and visceral components. Therefore, multimodal analgesic techniques utilizing a number of drugs acting on different analgesic mechanisms are becoming increasingly popular. During the immediate perioperative period, the gabapentinoids are expected to reduce the physiological sensitization process induced by nociception and inflammation, with a concomitant attenuation of the influence of central neuronal hyperexcitability on early postoperative pain. (1) Gabapentin is an anti-epileptic drug that has demonstrated analgesic effect in diabetic neuropathy, post-herpetic neuralgia, and neuropathic pain. In surgery with high risks of neuropathic pain, the preventative use of gabapentin and pregabalin may be considered.

Gabapentin

Pharmacology

The absorption of gabapentin is dose-dependent due to a saturable L-amino acid transport mechanism in the intestine. (2) Thus, the oral bioavailability varies inversely with dose. After a single dose of 300 or 600 mg, bioavailability was approximately 60% and 40%, respectively. (2) Plasma concentrations are proportional with dose up to 1800 mg daily and then plateau at approximately 3600 mg daily. (2) Gabapentin is rapidly absorbed orally. After ingestion of a single 300 mg capsule, peak plasma concentrations (C_{max}) of $2.7 \mu\text{g ml}^{-1}$ are achieved within 2–3 h. In humans, gabapentin is not metabolized and does not induce hepatic microsomal enzymes. It is eliminated unchanged in the urine. Its elimination half-life is 5–7 hours. (3) It has minimal drug interactions. For neuropathic pain, the Numbers-needed-to-treat (NNT, the number of patients that need to be treated for one to benefit clinically, usually 50% pain relief, compared with a control) for improvement with its use in all pain trials is 4.3. (3,4,5)

Adverse effects

No firm conclusion can be drawn with regard to adverse effects owing to lack of sufficient dose-finding studies. (1) Nausea, vomiting and pruritus have been reduced in some meta-analyses of combined data, whereas sedation was increased in other subsets of studies. (1,6) Adverse effects include somnolence (the most common), dizziness, ataxia, fatigue, nystagmus and weight gain. (3) Its Numbers-needed-to-harm (NNH, the number of patients exposed to a detrimental effect over a specific period to cause harm in one patient that would not otherwise have been harmed) for major harm is high. (3)

Mechanism of action

Gabapentin does not bind to GABA A or GABA B receptor but to the alpha-2 delta subunit of the presynaptic voltage gated-calcium channels responsible for the inhibition of the calcium influx. The inhibition of calcium release then prevents the release of excitatory neurotransmitters involved in the pain pathways. (7)

Dose

Single doses range from 250mg to 1,200 mg dose of gabapentin, administered one to two hours preoperatively. (7)

Evidence

Meta-analyses of several systematic reviews are available.

Cochrane

Gabapentin 250 mg is statistically superior to placebo in the treatment of established acute postoperative pain, but the NNT of 11 for at least 50% pain relief over 6 hours.(8)

Gabapentin 250 mg is not clinically useful as a stand-alone analgesic in established acute postoperative pain.

Meta-analysis

Gabapentin improves the analgesic efficacy of opioids both at rest and with movement, reduces analgesic consumption and opioid-related adverse effects, but is associated with an increased incidence of sedation and dizziness. (9)

Perioperative oral gabapentin is a useful adjunct for the management of postoperative pain that provides analgesia through a different mechanism than opioids and other analgesic agents and would make a reasonable addition to a multimodal analgesic treatment plan.(10)

Systematic Review

Gabapentin has an analgesic and opioid-sparing effect in acute postoperative pain management when used in conjunction with opioids.(11)

Effects

1. Opioid-sparing and improvement in postoperative pain score

In most studies, supplemental analgesic consumption and/or early (4 – 6 h) or late (24 h) postoperative pain intensity has been reduced.(1) Perioperative gabapentin helps to produce a significant opioid-sparing effect and probably also improves postoperative pain score relative to the control group.(9) Gabapentin provided better postoperative analgesia and rescue analgesics sparing than placebo in 6 of 10 randomised controlled trials (RCTs) that administered only pre-emptive analgesia.(12)

Tiippana et al (6) found that the opioid-sparing effect during the first 24 hours after a single 300 to 1,200 mg dose of gabapentin, administered one to two hours preoperatively, ranged from 20 percent to 62 percent. A recent RCT with the preoperative administration of 600 mg of gabapentin resulted in significant reduction in postoperative verbal analogue pain scores at rest and at movement as well as tramadol consumption compared with placebo on first postoperative day.(13)

2. Effect on postoperative nausea and vomiting (PONV)

Fourteen RCTs have suggested that gabapentin does not reduce PONV when compared with placebo, clonidine or lornoxicam.(12) However, a recent RCT showed a lower incidence of nausea and vomiting was an additional advantage.(13)

3. Gabapentin decreases preoperative anxiety. (2)

Although 1200 mg gabapentin was less effective in relieving preoperative anxiety than 15 mg oxazepam, (14) significantly lower preoperative visual analogue scale (VAS) anxiety scores ($p < 0.0001$) have been demonstrated in patients with gabapentin, compared with placebo, premedication before knee surgery.(15)

4. Antihyperalgesic effect

Although gabapentin has anti-hyperalgesic effects, (16,17) there is no scientific evidence to support its use for the prevention of chronic post surgical pain.(2)

5. Gabapentin attenuates haemodynamic response to tracheal intubation.(2)

6. Gabapentin reduces postoperative delirium.(2)

Its mechanism is unknown but possibly related to its opioid sparing effect.

(4,5, and 6 are inconclusive; more studies are expected in the near future)

Pregabalin

Recent years also have witnessed a heightened research interest in the analgesic, sedative, anxiolytic, and opioid-sparing effects of pregabalin (S+ 3-isobutyl GABA), a structural analogue of GABA and a derivative of gabapentin, in various pain settings, including postoperative pain.(7) Pregabalin has an established efficacy of varying degree in neuropathic pain conditions such as postherpetic neuralgia, painful diabetic neuropathy, central neuropathic pain, and fibromyalgia.(7)

Pharmacology

Pregabalin is structurally related to gabapentin but has linear pharmacokinetics, and its binding affinity for the $\alpha 2\delta$ -1 subunit is six times more potent than that of gabapentin.(1) Pregabalin has a rapid onset with an oral bioavailability of approximately 90%. It is well tolerated. It undergoes negligible hepatic metabolism with 95% excreted unchanged in the urine. Its elimination half-life is 6.3 hours.(3,18) Pregabalin has minimal pharmacokinetic drug interactions.(3)

Adverse effects

Again, no firm conclusion can be drawn with regard to adverse effects owing to lack of sufficient dose-finding studies.(1) Sedation was a significant side effect in 7 of the 13 Randomised Controlled Trials (RCTs).(1) In persistent pain, the relatively high frequency of central nervous system adverse events, particularly dizziness, somnolence and ataxia, is a concern in the elderly patients.(19) In addition, peripheral oedema with weight gain can occur.(3,18) The NNH for minor adverse events are 2.9 for dizziness, 4.4 for somnolence, >20 for nausea and 13.3 for constipation.(3,18)

Mechanism of action

Its mechanism of action is thought to be probably similar to that of gabapentin but has a superior pharmacokinetic profile.(7) It binds to the alpha 2 delta-protein subunit of voltage gated calcium channels reducing calcium influx to the neurons, thus decreasing glutamate release and decreasing activation of alpha-amino-3-hydroxy-5-methyl-4-isoxazolepropionate receptors.(20)

Dose

It is given orally at a total dose of 150–600 mg/day.(3)

Evidence

Cochrane

The analgesic effect of pregabalin in acute postoperative pain has been evaluated in 13 randomized, double blind, controlled studies.(1) Six of the first published studies were included in a recent Cochrane review.(21) There was no clear evidence of beneficial effects of pregabalin in established acute postoperative pain.(21) The effect of pregabalin on acute postoperative pain remains questionable. Results from placebo-controlled, randomized trials are inconsistent, with no clear dose–response relationship (except that single-dose administrations < 100 mg have generally been ineffective), and with no clear indications of a surgical procedure-specific analgesic effect.(1) Of the 13 published studies, four demonstrated no effects on pain or requirements for supplemental analgesia, whereas seven showed some (often low to moderate) effect on analgesic requirements, and five some effects on pain.(1)

Effects

1. Opioid-sparing and improvement in postoperative pain score

Pregabalin provided better post-operative analgesia and rescue analgesics sparing than placebo in 2 of the 3 RCTs that evaluated the effects of pregabalin alone versus placebo.(12) Pregabalin reduces pain and opioid consumption after surgery in comparison with placebo.(12)

2. Effect on postoperative nausea and Vomiting (PONV)

Pregabalin does not seem to have any influence on the prevention of postoperative nausea and vomiting (PONV).(12)

3. Pregabalin has failed to reduce preoperative state anxiety.(22)

Conclusion

Gabapentin and pregabalin are effective in reducing pain intensity, opioid consumption and opioid-related adverse effects after surgery. Gabapentin and pregabalin have very few adverse effects of their own. Because of the heterogeneous data of these studies, no conclusions about the optimal dose and duration of the treatment can be drawn.(6)

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Question 9 - Non Compulsory

Melvin Becks is a 54 year old plasterer who fell from a ladder 6 months ago and sustained an undisplaced fracture of his left tibial plateau. He is complaining of increasing tiredness after using slow release morphine 400mg per day and ibuprofen plus codeine 8 daily since then for persisting knee pain.

Describe the possible causes of his tiredness.

Response:

Tiredness, and the related complaint of fatigue, is one of the most common symptoms presented to General Practitioners, and one which is a significant clinical problem because of the large number of disorders for which this can be the first manifestation. Its assessment and management benefits from a thoughtful approach bearing in mind the possibilities of:

- Physical disorders
- Psychological disorders
- Lifestyle disorders

The management depends upon accurate diagnoses following careful history, examination, selected investigations in a setting which allows adequate time and follow-up.

In addition to pain history a basic history for tiredness should include:

- Description of symptoms
- Functional impact, including complications (eg falls, MVA)
- Sleep history
- Activity history
- Substance use history
- Medical history and general system review

Tiredness is a subjective symptom with a variable impact on functioning depending on the context, which needs to be taken into account when assessing the relevance of observations provided by the patient and by observers. Mild tiredness may not be obvious to others, especially if observing for a short period, when only a limited period of sustained concentration is required, and when the environment may provide sufficient stimulation to overcome its effects. For this reason, testing in a brief clinical interview, when the patient intends to provide a high level of attention, is unlikely to identify objective signs of minor fatigue. This highlights the importance of obtaining information from a reliable collateral source, such as the patient's partner, who can identify changes from usual patterns, especially changes of function when not in a stimulating environment.

A person functioning with mild tiredness may be able to avoid the complications of tiredness (slower inefficient work, intellectual mistakes, physical accidents, impaired memory and mood instability) for shorter periods than usual, especially if they are personally committed and highly motivated to the task. However they are likely to fatigue more quickly, and to take

a longer time to recover subsequently. They are also less likely to be aware of their mistakes, especially at the time.

The comment that Mr Beck's tiredness is increasing indicates that uncomplicated recovery is not likely to be the cause of his tiredness, and that intervention is required to identify the contributing causes, which is likely to be a progressive process, and to worsen if no change is introduced.

Consideration of factors acting before his injury, even though the tiredness has only been reported since the accident, should be considered. This may include consideration of pre-existing disorders, perhaps aggravated since the injury, which may have contributed to the risk of the fall that occurred. Eg diabetes and other disorders, alcohol and other substance use.

The most likely causes in this patient are

- Opioid medication effect
 - Sedation, anergia though the increasing nature of the tiredness is to be explained (eg increasing dose, other effects of the medication, multiple contributing factors)
 - Endocrine suppression, especially Testosterone
- Sleep deprivation secondary to the intensity of the pain, though the persistence of the pain at this level is unusual. This may be because of the extra effort required to maintain activity, and assessment depends on the period since Mr Beck began his return to work.

Other causes of the continuing severe pain would then need to be considered, including further deterioration in relation to the fracture (aggravation of OA), possible CRPS, possible infection, secondary strain on other joints following altered gait under load.

- Sleep deprivation secondary to Obstructive Sleep Apnoea. This may be directly aggravated by use of sedative medication, notably opioid medication, and / or indirectly by weight gain as a result of inactivity, increased eating.
- Inappropriate medication use
 - Other analgesic medication
 - Excessive use of prescribed analgesic medication
 - Benzodiazepine and other sedative medication
- Anaemia from GIT blood loss from anti-inflammatory medication
- Combination of limited cardiovascular capacity / fitness in a 54 yo man in a heavy labouring occupation with increased energy demands because of his impairment with a painful leg. (It is notable that plasterers are required to be able to work at heights on building sites, to use ladders and steps, lift and carry heavy weights, be flexible, strong and agile, working in extended postures for considerable periods).

The timing of Mr Beck's return to work should be considered, especially if there is a combination of him having lost fitness through being very sedentary during his convalescence, perhaps increasing weight, and then needing more than usual effort to maintain expected productivity.

- Possible lifestyle factors (alcohol, caffeine excess, illicit drug abuse, obesity, unbalanced diet, dehydration, work/rest schedules, hours of work)
- Depression and / or other psychological disorders (anxiety, PTSD) secondary or coincidental to the incident, pain, treatment and continuing difficulties. These effects may be directly attributable to the pain, or caused by the incident especially if perceived as life threatening. This may include a loss of work, income and opportunities, which may be threatening depending on his circumstances.

Social Stressors. It would be useful to learn of his usual financial status, the nature of his business arrangements (self employed, employee, employer), availability of Income Replacement (Workers Compensation, Disability Insurance) and whether a legal action is pending.

Relationships can become strained with the added stress of pain and disability. This can disrupt sleeping arrangements.

- Associated disorders. As a 54 year old man, he is subject to many conditions which can present with tiredness, including:
 - Diabetes
 - Renal, Cardiac disorders
 - Endocrine disorders (eg thyroid)
 - Infection
 - Neoplastic disorders
 - Neurological disorders. (If he had a period of loss of consciousness at the time of the fall, his recovery will possibly be slower, with a small risk of subdural haemorrhage.)

Question 10 – Non Compulsory

Provide a classification of incident pain in cancer patients.

Describe the management approaches for each.

Incident pain is part of the subset of “transient” pains that may occur in the cancer population. It has variably been defined as severe episodic pain occurring in response to a stimulus usually, but not always movement, and that impairs quality of life. It may occur on the background of a stable pain syndrome (i.e. breakthrough pain) or de novo, in situations where patients are not taking analgesics. The literature is littered with definitions of ‘incident pain’ including variable inclusions and exclusions. However Cleary (2005) provides an illustration of this, in likening it to the angina experienced by a patient with ischaemic heart disease. Unfortunately he also substitutes ‘incident’ for ‘breakthrough’ pain i.e. the cancer patient may experience pain on a background of little or no pain, and it may have a known or unrecognized trigger e.g. movement or rest or emotion.

Fainsinger and Nekolaichuk (2008) have defined incident pain as that “... when a patient has background pain of no more than moderate intensity with intermittent episodes of moderate to severe pain, usually having a rapid onset and often a known trigger”. (p. 552) They provide six key characteristics of incident pain;

1. The intensity of incident pain is significantly greater than background pain
2. The intensity of incident pain is moderate to severe
3. The trigger is often known and may include such activities as movement, defaecation, micturition, swallowing and dressing change however other significant intermittent pain where no trigger is recognizable, may be included (*Lasheen et al. (2010) describe intermittent pain with no precipitating factor as ‘non-incident pain’ whilst Zeppetella 2010 describes it as being volitional e.g. walking but excludes defaecation and micturition, and terms these as ‘spontaneous pains’*)
4. The onset is rapid with a peak effect often occurring within minutes
5. The duration is transient and does not often last longer than 30 minutes
6. The pain is intermittent, recurring with initiation of the trigger (or apparently at random).

Incident pain may be classified according to mechanistic criteria i.e. nociceptive somatic and visceral, neuropathic, inflammatory and mixed. Somatic pain which is the most common form of incident pain and occurs in response to movement usually secondary to bony metastatic disease; visceral pain may be secondary to distension of hollow organs eg. tenesmus or bladder pain secondary to distension; neuropathic pain, which may occur as a manifestation directly from infiltration or distortion of nerves in the cancer patient or as a result of infections secondary to immunosuppression e.g. herpes zoster with resultant post-herpetic neuralgia, or treatment therapies e.g. paclitaxel, platin or vinca alkaloid induced neuropathies; and inflammatory pain which may result from infections and wounds where there is pain on movement or dressing. Incident pain syndromes can also be mixed in aetiology.

Patients with cancers metastatic to bone are at highest risk of incident pain e.g. the patient with a pathological fracture may be reasonably comfortable at rest, but experience episodes of severe pain for up to 30 minutes on movement whilst the patient with leptomeningeal disease may describe severe pain in response to coughing or sneezing. Likewise patients with a primarily neuropathic pain syndrome e.g. brachial plexopathy in the setting of a

Pancoast tumour or metastatic breast cancer may experience similar severe episodes of allodynia and/or hyperalgesia and/or hyperpathia where sensation has been altered by tumour, surgery, chemotherapy-induced neurotoxicity or chronic post-radiation change. Exacerbation of pain secondary to visceral distension may produce severe colicky type pain which is time limited, and swallowing and eating in patients with mucositis secondary to chemo-radiation therapies for head and neck tumours or haematological malignancies may also induce severe incident pain.

The principles of management of incident pain include –

1. As in all situations in which pain is the presenting complaint, a **complete biopsychosocial history and examination** is important to determine the focus and aetiology of the pain together with a recognition that the **psycho-spiritual issues** of patients with cancer impact upon their experience of pain. (Fainsinger and Nekolaichuk, 2008). Reassessment at regular intervals is important to determine the efficacy of treatment. It should be noted that the presence of incident pain is usually associated with a reduced ECOG score and hence poor prognosis.

2. Lifestyle changes to enhance **copng strategies**.

This may include psychological strategies including the use of imagery, mindfulness, cognitive-behavioural techniques, and pacing. Occupational therapy involvement to assist with the provision of aids to assist in the activities of daily living. Involvement of physiotherapists to provide exercises specific to patient needs to minimize de-conditioning.

3. **Modification of disease process.**

This may involve surgery, especially internal fixation of imminent or fractured bones which can produce marked improvement in reports of incident pain, chemotherapy or radiation therapies. Included in this may be the use of bisphosphonates, hormone therapies and some of the novel therapies affecting bone resorption e.g. osteoprogenin analogues, Vitaxin and endothelin-1 antagonists. Assessment and management of infections particularly ulcers is important in managing incident pain.

4. **Management of reversible causes.**

Cough induced incident pain where there are fractured ribs or leptomeningeal disease may be ameliorated by anti-tussives; constipation can produce fistulae which produce incident pain on defaecation so laxatives and surgical therapy may assist with this; colicky abdominal pains may respond to hysoscine, octreotide or surgical decompression. Incident pain related to joint movement may respond to the use of orthotic devices inhibiting such movement. Incident pain secondary to movement of limbs with Pathological fractures or imminent fractures responds to surgical fixation. Active treatment of infections with antibiotics and drainage of abscesses can reduce incident pain.

5. Addressing **psychological, psychiatric and spiritual issues** which contribute to increased levels of distress and suffering is essential in these patients. Increased pain intensity has been reported in patients with maladaptive coping skills, lower levels of self-efficacy and distress secondary to disease treatment or progression. Suicide and suicidal ideation are more common in patients with uncontrolled pain and patients with advanced disease with pain, depression or delirium are at highest risk. Adjustment disorders, major affective disorders and delirium are the most common psychiatric disorders associated with cancer patients who experience pain.

6. Symptomatic management includes **non-pharmacological therapies** and drugs.

a. Massage and the application of heat and cold packs may benefit some patients. Certain positions may also be found to reduce the frequency of incident pain.

b. **Drugs.** The mainstay of drug treatment in incident pain syndromes remains opioids. However background analgesics including opioids and, where relevant, adjuvant analgesics, should be optimized. Mercadante et al (2004) demonstrated that increasing opioid analgesic administration to the point of adverse effect could decrease the frequency of episodes of incident pain.

Traditionally opioid therapy for the treatment of incident pain has been used. Ideally the opioid of choice should provide a pharmacokinetic and pharmacodynamic profile which matches that of the temporal qualities of incident pain i.e. rapid onset, early peak in severity and offset in approximately 30 minutes. Traditionally opioids such as morphine, oxycodone and hydromorphone have been used either orally, which offers the advantage of ease and convenience, or parenterally either prior to a predictably painful activity e.g dressing change. However these agents do not really mimic the temporal nature of incident pain, hence the more recent development of transmucosal preparations. At present oral transmucosal fentanyl citrate (OTFC) lozenges are available with evidence of their efficacy, safety and tolerability in opioid tolerant patients. Unfortunately for patients who do not have a background analgesia requirement, the doses are quite high.

Fentanyl buccal tablets have been approved in the U.S and are useful for the semi- or unconscious patient prior to painful procedures e.g. turning. Other novel delivery methods include aerosolized lipophilic opioids such as free and liposome-encapsulated fentanyl and nasal administration of sufentanil, fentanyl and alfentanil.

Other agents and methods of delivery include PCA devices which are increasingly being produced as disposable and ketamine which can be particularly efficacious especially in the setting of mucositis with incident pain produced on swallowing or eating. Local anaesthetic mouth-washes may also be useful in pre-empting incident pain in the patient with chemo- or radiation-induced mucositis.

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Question 11 - Non Compulsory

Mrs Beryl Toohey is referred for management of severe acute exacerbation of chronic central abdominal pain radiating to the back. Her investigations identified a multiloculated pancreatic cyst and her amylase was 2500 units per Litre.

Outline your recommendations for immediate and long term management.

Chronic pancreatitis (CP) is a disease process characterised by irreversible morphological changes that typically cause pain and loss of function. Alcohol is a common precipitating cause in the majority of cases. Other causes include tropical pancreatitis, hereditary, gallstones, infective and envenomation. Chronic pain is present in 80-90% of patients. It is usually severe dull deep epigastric pain radiating through to the intrascapular area. It is recurrent, long standing and severe, commonly leading to chronic intake of analgesic medications including strong opioids.

In managing patients with this pain modifying risk factors most notably alcohol intake is of the utmost importance. The mechanism for pain is still poorly understood and treatment is largely empirical. Chronic pain may be either stimulus independent or postprandial pain.

Though medical management of pain is the mainstay of treatment some interventions may merit consideration. It must be highlighted that outcome studies of many of these interventions have not been repeated are of low quality or are a result of small numbers. This must be emphasised to any patient seeking an intervention for the pain associated with CP. Inflammatory cytokines and gene expression similar to those that occur in neuropathic pain also have been identified in CP. This suggests that agents such as tricyclics antidepressants and anticonvulsants may be useful. More recently tramadol in higher doses than normal may be useful.

Any surgical intervention such as decompression of pancreatic ducts and relief of ductal hypertension has merit as has decompression of pancreatic parenchymal tissue analogous to compartment syndrome. This may decrease pressure within the pancreas and tissue acidosis. A surgical opinion from a specialist centre should be sought.

Endoscopic procedures involving stricture dilation, stents and stone extraction have resulted in improvements in approximately 2/3 of patients. Extracorporeal shock wave lithotripsy in addition to endoscopic therapy has some added benefit. These are generally better when dilated ducts and calcification / stones are identified. Surgical options should only be considered if an inflammatory mass is present and resectable or obstruction and dilated ducts are greater than 5-7 mm. Various surgical approaches have been studied. The Whipples or the more conservative Frey procedure found to be most useful.

Neuroslysis or nerve blocks such as celiac plexus blockade or splanchnic blockade shown to be of great use in carcinoma of the head of the pancreas have been disappointing in the long term management of CP. Recent technological advances have allowed an ultrasound guided endoscopic celiac plexus block to be safe repeatable and cost effective when compared to alternative coeliac plexus block approaches. It is more useful in acute exacerbations episodes rather than constant dull aching pain. Coeliac plexus blockage

using phenol or alcohol may result in significant disorders of gastrointestinal function and / or orthostatic hypotension and is inadvisable for non cancer pancreatic pain.

Splachneectomy using videoscopic thoracoscopy (VSPL) may be of some longer term benefit. Its utility is more predictable if it is preceded by differential epidural analgesia(DEA). If DEA identifies patients whose pain is primarily visceral VSPL is likely to be more successful.

Acupuncture in any of its techniques and TENS have been shown to be ineffective. Spinal cord stimulation has proved effective in a small series of patients and is a less invasive procedure when compared with surgery should be considered.

Acute pain management will include opioids as a main stay of treatment. Antiinflammatories may be used with caution as disseminated intravascular coagulation can be a complication of acute pancreatitis. If conditions allow epidural analgesia using local anaesthesia and opioids are a safe option via a tunnelled or implanted epidural system.

When advising a patient with CP on an intervention for pain relief, realistic goals must be identified. Endoscopic decompression duct dilation and stenting carries a low morbidity and might be considered first. VSPL preceded by DEA might then be seen as the next step. Spinal cord stimulation should also be considered prior to major surgery. Any procedure offered must be accompanied by multidisciplinary support and measurement of not only pain reduction using the visual analogue pain score (VAPS) but also functional improvement and quality of life scales.

- 1 Fasanella KE et al; Pain in Chronic Pancreatitis and Pancreatic Cancer
Gastroenterol Clin N Am 36 (2007) 335-364
- 2 Bradley EL et al; Thoracoscopic Splanchnicectomy for "small duct" chronic pancreatitis:
case selection by differential epidural analgesia
J Gastrointest Surg. 1998 2(1) 88-94

2. Question 12 - Non Compulsory

Your physiotherapist has just resigned from your clinic and there is a hospital wide freeze on the appointment of new staff.

Write a letter to the CEO justifying reemployment of a physiotherapist within your multidisciplinary group program.

Please note: This model answer is detailed; candidates are not expected to reproduce such detail in a 10 minute examination question.

Key aims to be demonstrated in the answer:

1. Candidates must present a convincing argument for retention of the physiotherapy position (letter style with dot points is acceptable, given the time restrictions of the examination).
2. Candidates must demonstrate an understanding of Multidisciplinary Pain Management (MDPM) (*including group programmes*) and why they are the standard of care in most pain centres (evidence base).
3. Candidates must be able to describe the duties and 'justify' the contributions of a *physiotherapist* in a MDPM team.
4. Candidates should demonstrate a capacity to deal with requests from health care administrators (something they will encounter in their careers). They should answer the question from the perspective of a 'clinical leader', such as a head of department - essentially present *a clinical and business case to defend the physiotherapy position* (consider clinical service provision, costs, accreditation, QA/QI, safety, research, training, strategies such as mediation & 'bargaining').

Key points in the answer:

JUSTIFY MDPM and GROUP PROGRAMMES:

- MDPM, including group programmes, is an important evidence-based (NHMRC Level I-II) (1-5) service provided by this hospital for many years; timely access to MDPM is a major recommendation of the recent National Pain Summit (NPS) (Canberra, March 2010) (<http://www.painsummit.org.au>) in order to optimise patient care and reduce the burden of chronic pain which affects 20% of patients attending our hospital.
- There is a world-wide movement (supported in our hospital) towards *multidisciplinary management* of other chronic conditions such as diabetes and inflammatory bowel disease, and in disciplines such as palliative care, rehabilitation medicine and psychiatry. (NB: other multidisciplinary programmes in our hospital remain fully staffed which justifies continued funding of our physiotherapy position).
- MDPM group programmes are an effective means of managing patients with chronic pain and are less resource intensive than one-on-one clinical encounters such as clinic appointments or inpatient treatments. These programmes encourage self-management, with less reliance on expensive hospital-based resources such as clinics, medications (eg. opioids and gabapentinoids), investigations and interventions.

JUSTIFY THE PHYSIOTHERAPIST AS A KEY MEMBER OF THE MDPM TEAM:

- A physiotherapist is a key member of any multidisciplinary pain team (including group programmes); this is recognised by this hospital, also other pain centres in this state, the rest of the country and around the world.
- A physiotherapist is recognised as a key member of a MDPM team by the Faculty of Pain Medicine, Australian and New Zealand College of Anaesthetists (FPM, ANZCA) (professional document: PM2) (6) and other authoritative bodies such as the Australian Pain Society (APS) (7), International Association for the Study of Pain (IASP) (8) and the Australian Council on Health Care Standards (ACHS) (9).
- *Therefore, we cannot provide MDPM (including group programmes) without a physiotherapist; failure to renew the physiotherapy position seriously undermines the integrity of our MDPM programme, which is contrary to safe and effective evidence-based management of our patients.*

OTHER DUTIES OF A PAIN PHYSIOTHERAPIST ('VALUE-ADDING' THE POSITION):

Our physiotherapist is not just involved with the group programme, but provides other services that would be compromised if the position were lost, including;

- Specific treatments for pain-related conditions, especially musculoskeletal diseases such as back pain, which is the most common reason for referral to our clinic; also manages specialized evidence-based pain management programmes such as *cortical retraining* for CRPS, phantom pain etc, rehabilitation for fibromyalgia.
- Our physiotherapist is a key stake holder in *patient assessment* (team clinics, screening for group programmes, ongoing assessment during therapy). The physiotherapist spends a great deal of time with the patient 'hands-on' and provides the entire pain team with vital feedback on progress.
- During therapy, physiotherapists *educate patients* about pain (which is therapeutic) and also reinforce *psychological* pain management strategies (eg. pacing, reducing fear avoidance); *they provide a vital counselling and teaching role for patients.*
- Our physiotherapist is a stakeholder in the hospital's QA/QI programmes and is our Occupational Safety and Health Officer.
- Our physiotherapist provides training and education for health care professionals (including our GP back pain training programme) and is involved in research and audit.

ACCREDITATION ISSUES:

- As a teaching hospital (including pain medicine), loss of our physiotherapist will result in *loss of training accreditation by the FPM, ANZCA* (which mandates at least 0.5 FTE equivalent physiotherapy input per week) (professional document FPM: PM2) (6). Consequently, loss of our training pain fellow would reduce service provision further (less clinics, inpatient services, acute pain service rounds etc).
- The ACHS recognises physiotherapists as key stakeholders in multidisciplinary pain centres (9); loss of our physiotherapist may impact on future *in-depth reviews by the ACHS*, possibly affecting accreditation of our hospital.

- Loss of our physiotherapist means less qualified (and possibly more expensive) health care professionals will need to assume some duties (clinics, group programmes & patient education), which will impact on service provision and quality of care.

OFFER A SOLUTION (BARGAINING)?

Should you wish to enhance service provision to justify retention of the physiotherapy position, we propose the following 'value-adding' approach (covered within our department);

- Our physiotherapist to run a weekly (1 session) back pain assessment clinic, thereby reducing medical manpower costs and clinic waiting times, also reducing inpatient admissions and facilitating ED discharge for patients with back pain.

In conclusion, we are not requesting extra funding for a *new* position, but simply to *maintain current levels of service provision* by our physiotherapist, the value of which is outline above.

Any apparent cost saving of our physiotherapist's salary is "false economy", with increased costs and reduced quality of care associated with compromised MDPM, also other adverse impacts listed above.

Sincerely,

Dr X

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Question 13 – Non Compulsory

What are the methods available to prevent the evolution to and severity of Post Herpetic Neuralgia?

Epidemiology:

Herpes Zoster (HZ) (shingles) is caused by the reactivation of the varicella-zoster virus (VSV) which lies dormant in the dorsal root and cranial nerve ganglia following primary infection with chickenpox (varicella) usually in childhood.

Currently most Australians have been infected with varicella zoster virus.

They therefore are at risk of developing AHZ and then going on to develop PHN.

There is a marked increase in the risk of shingles with increasing age and with diseases and drugs that impair immunity. Lifetime risk is estimated at 20-30%, but is up to 50% in those aged 85. The older the patient the higher the risk they will develop PHN.

So a two-pronged attack is required to try to reduce the incidence and severity of PHN.

Prevent Acute Herpes Zoster (AHZ).

1. Immunization in childhood.

2. Re-exposure is important to boost the cell-mediated immunity.

3. Primary infection produces long-term immunity. Protection from reactivation depends on intact cell-mediated immunity. This declines with age, with certain diseases (HIV, some malignancies) and with immunosuppressive therapies (organ transplant, chemotherapy and steroids)

4. Adult immunization will become increasingly important. With childhood immunization, the pool of infection within the community will decrease. This may increase the risk of AHZ within the community, in the short term, as individuals previously infected with the Herpes Zoster virus (childhood chicken pox) will not have their immunity "boosted" by multiple re-exposures. Until the cohort of immunized children reach adulthood, we can expect the incidence of AHZ may increase.

5. Role of live attenuated VZV vaccine (Zostavax).

This vaccine is now available to prevent HZ (and therefore PHN) in individuals over 60 years of age. A large, multicentre randomized placebo controlled trial (The Shingles Prevention Study) demonstrated its efficacy, with a reduction in the incidence of HZ by 51.3%, PHN by 66.5% and the HZ-associated burden of illness by 61.1%.

The estimated number needed to vaccinate to prevent a case of HZ was 11 (CI: 10-13) and for PHN 43: (CI: 33-53)

The Advisory Committee for immunization in the USA and Pharmaceutical Benefits Advisory Committee of the Australian Government (PBAC 2008) recommend vaccination with live attenuated VZV for all immunocompetent persons 60 years or older, even if they have had a previous episode of HZ.

In Australia it is indicated to prevent HZ and PHN, and reduce acute and chronic pain in individuals aged over 60.

Prevent PHN after an episode of Acute Herpes Zoster.

Principle goal of treatment of AHZ is to reduce pain in the immunocompetent patient and cease viral replication in the immunocompromised patient and those with ophthalmic HZ.

All patients need a medical and psychological assessment to confirm the diagnosis and document the physical and psychological context in which this disease develops.

1. Patients who develop AHZ need to be recognised quickly and treated early and aggressively to try to reduce the incidence and severity of PHN.

2. Antiviral medication:

The antiviral medications (valaciclovir, famciclovir, acyclovir) given within 72 hours can reduce much (but not all) of the morbidity associated with Acute Herpes Zoster. They do accelerate the resolution of acute pain and skin lesions. However Cochrane review suggests they don't significantly reduce the incidence of PHN.

Although the antivirals work best when prescribed within 72 hours of the rash onset, current evidence suggests benefit may extend beyond this time period, so if the pain is severe or lesions are progressive it is still recommended to trial the antivirals.

As increasing age, the presence (and severity) of prodromal pain, and the severity of acute zoster pain all "predict" that PHN will develop, antivirals should be prescribed in these individuals.

Those individuals aged over 50, or if immuno-compromised or with ophthalmic zoster, could also benefit.

The valaciclovir and famciclovir do have better pharmacokinetics and simpler dosing so they are currently the drugs of choice.

They are still under-prescribed in Australia.

3. Corticosteroids (oral), tapering over 3 weeks, can reduce the acute inflammatory phase, if used in conjunction with the antivirals. They allow a modest reduction in pain intensity and improved rate of skin healing for up to 14 days but with no effect on overall recovery rate at 3 weeks. They do not prevent PHN.

4. Analgesics:

Zoster associated pain should be treated early and aggressively as evidence suggests it is more difficult to treat once established.

The more severe the acute pain, the higher the risk of PHN, suggesting early aggressive treatment is appropriate.

Regular paracetamol in addition to an opioids or tramadol as required has been recommended.

Oxycodone CR did significantly reduce the average worst pain during the first 14 days of AHZ, but patients withdrew from the trial due to constipation.

5. Tricyclic antidepressants:

Early administration of Amitriptyline (25mg nocte) for 90 days, did decrease the incidence of PHN at 6 months by 50%.

6. Anticonvulsants:

Gabapentin and pregabalin have been shown to be useful in patients with neuropathic pain including PHN. A single dose of gabapentin (900mg) did decrease pain intensity and decreased the area of allodynia for up to 6 hours but no analgesic benefit was seen when prescribed for 28days.

7. Topical lignocaine:

5% patches applied for 12 hours twice daily on intact skin during AHZ significantly reduced pain intensity and improved patients global impression of pain relief.

8. Aspirin:

Topical aspirin in either moisturizer or diethyl ether was an effective analgesic in HZ.

7. Neural blockade:

Sympathetic and epidural blocks have been used but few controlled studies examine their effects.

71% studies (12/15) showed reduction in incidence or severity of HZ associated pain.

However the NNT for complete resolution of HZ pain at one month was 10.

Aggressive analgesia with epidurals may have a role to reduce incidence but intensity of PHN.

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Question 14 - Non Compulsory

A boy of 12 years who has been missing school regularly presented with a history of chest pain, for which 12 specialists could not find the cause. His father was in jail, his mother was anxious.

How would you manage this?

In answering this question, assume that the child's physical condition has been adequately assessed by the various specialists he has seen, therefore concentrate on the psychosocial aspects of the presentation and management.

Non-physical causes of pain in this age group can include the presence of a diagnosable psychiatric illness, such as depression, generalised anxiety disorder, panic disorder, and somatoform disorder, as well as non-specific emotional distress expressed as physical symptoms, namely pain (somatisation).

An emotional cause for the chest pain might be attributed to the father's incarceration; it is recognised that family separation can be a stressor that precipitates psychogenic pain. The pain could also be a response to maternal anxiety. Pain and school avoidance can also occur in response to bullying at school by other children, or as the result of sexual abuse.

It is necessary to exclude a specific diagnosable psychiatric illness.

My assessment will include

- General medical history, as well as a pain history
- Review of medications and treatments to date
- Effect of pain on sleep, ability to socialise with family and peers/play sport
- School: type of student/grades, truancy pattern/ no of days missed, bullying, corroborations with school report/teachers/counsellor/school nurse, difficulties noted, learning disability/ classes missed/ avoidance pattern/ is this a new school/ has child just transitioned or about to go to high school -year 7/ friendships made vs. Socially isolated, shy vs. Antisocial, aggressive or inappropriate, challenging of authority
- Family tree/genealogy/ family dynamics and family medical history (chest pain/cardiac including in family friend) and psychiatric history - include other siblings and impact of this child's pain upon them
- History of abuse – physical, sexual, substance
- Psychosocial history of child and parents – relationships and history of why father is in jail, onset of pain symptoms/ truancy in relation to this, impact of father's imprisonment on child/siblings and mother; previous involvement of social services for child and/or mother
- Physical examination and mental status examination: child's affect, interaction- social skills, attitude, eye contact, intellectual level/ maturity, evidence of recent physical trauma, chest/pectus deformity

- Indirect assessment of mother if she is in attendance or accompanying carer
- Review of investigations (ecg, echocardiogram, cxr, spine series, skeletal survey, bone scan, FBC, ESR, CRP, CT chest, angiogram, barium swallow, oesophago-gastroscopy)

Depending on my diagnostic conclusion, it is likely that a multidisciplinary assessment and management plan is needed - ideally with the involvement of a child psychologist, psychiatrist, social worker, paediatric/adolescent pain management team.

I would aim to interview the child and carer separately at the first or later assessment/s. Multiple assessments/ reviews may be necessary to get the full history.

My management approach will be influenced by the mental state/ psychopathology in the mother and/or the carer that attends with the child and the level of engagement and rapport established with them and the child.

If I consider the child at-risk then I would be obliged by mandatory report laws to report to, and involve, DHS and consider inpatient admission for further assessment/s to be carried out.

Liaison and interdisciplinary team meetings/ case conference may be required, along with communication with the involved local doctor and or paediatrician. A united approach will be necessary to contain further doctor seeking.

Therapeutic options are influenced by the diagnosis and include:

- establishing rapport, offering explanation / education/ reassurance
- simple analgesia if sports related, costochondritis or intercostal muscle/cough related and consider heat packs/ massage
- consider TENS, Biofeedback
- family and individual counselling/ social work involvement/ psychotherapy/ psychiatric review depending on psychopathology present – ensure follow-up for mother with LMO or local/own psychiatrist if indicated.
- appropriate medications if a diagnosable psychiatric disorder is confirmed by a child psychiatrist.

Address sleep hygiene

Address school avoidance - return to school plan/ contract
liaise with teachers/ year co-ordinator / school nurse

We think that a 'pass' candidate will need to mention these considerations:

Evaluation for depression / anxiety disorder

'Modelling' of pain - family member or friend with chest pain/ serious cardiac pathology

Stress/ Poor coping and life skills/ Response to father's absence/ Poor role models/ Attachment disorder/ Sick role adoption/ Cry for help

School bullying

Maternal anxiety/doctor shopping, drug seeking/diverting,

Child/children and/or mother at-risk,

Munchausen's by proxy

Body image issues – obesity, chest deformity, 'FLK syndrome'

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Question 15 – Non Compulsory

A family asks about euthanasia for their 78 year old mother who has severe upper lumbar and pelvic pain and lethargy related to wide spread metastatic colon cancer.

Describe your approach to this patient's management near the end of life.

Object of question

To broadly assess the candidate's understanding of the issues surrounding end of life care in the face of poor symptom control including pain.

Q15 suggested answer

This question could be answered in many ways. We have tried to indicate the core elements of the answer and provided some background on other likely areas that may be raised.

General comments

The request for euthanasia clearly indicates the family is distressed. This question is not specifically about euthanasia but rather end of life care in the presence of uncontrolled symptoms.

This request will require a great deal of time to address and would benefit from the resources of a TEAM which may include:

Oncology services (disease modifying treatments)

Palliative care services (for community support)

Psychiatry/psychology

Social work

Nursing

Approach

Determine reason for request for euthanasia which will require:

Assessment of patient.

This may require hospital admission

Does the patient share the request for euthanasia?

Patients actually experiencing pain are less likely to find euthanasia unacceptable than other members of the public including Doctors [1].

History/examination/Investigations to determine contributors to pain/other symptoms (e.g. lethargy) and screen for potentially treatable problems e.g.

causes of fatigue including anaemia, biochemical (e.g. hypercalcaemia)

causes of pain including: crush fractures, focal bony metastases (suitable for radiotherapy), hypercalcaemia

Further investigations may be required depending on assessment

Psychological state particularly in light of the family's request for euthanasia.

Patients with cancer and pain are twice as likely to develop a psychiatric complication than patients with cancer and no pain [2]

While three main variables correlate with the desire for death (depression, pain and low level of family support) depression lies closest to the desire for death [3]

Interview with family

Explore concerns and reasons for requesting for euthanasia
e.g patient's pain, lethargy, other uncontrolled symptoms e.g. nausea, patient distress, grief, loss, guilt, previous conversations with patient etc

Ongoing management of pain (will depend on patient location - home, hospice, hospital etc)

- Provide disease specific treatment if acceptable to patient/family and situation e.g. radiotherapy to painful focal bony metastases, correction of hypercalcaemia, transfusion for anaemia, vertebroplasty for spinal fractures [4] and zoledronic acid [5]
- Provide palliative analgesia both pharmacological and non-pharmacological.
- Pharmacological - keep simple. Depends on type of pain. Opioids especially in nociceptive pain.
- Physical measures e.g. pressure care/massage/mobilization etc
- Psychological techniques e.g. relaxation, grief and loss counselling, cognitive monitoring
- Social - supportive measures for patient and family. Consideration of respite care if at home.
- Spiritual counselling for patient and family
- Interventional pain procedures where appropriate including neuraxial drug delivery and neurolytic blocks.
- Manage psychiatric comorbidities e.g. depression (pharmacotherapy and psychotherapy as appropriate)

Euthanasia (based on the wording of the question this should not be considered a core element of the answer)

Definition: the deliberate termination of life of a person afflicted with an incurable and progressive disease inexorably leading to death [6]

Pain is not the sole reason for requests for euthanasia in the community. In Australia attention was focused by the Northern Territory Parliament passing the Rights of the Terminally Ill Act (ROTI) 1995. During the nine months provision of euthanasia was legal in the Northern Territory seven people made application to undergo euthanasia and four people died under the Act. Uncontrolled pain was not a feature in any of the seven [7]. Euthanasia remains illegal in Australia due to the widely recognised difficulty in ensuring all acts are truly voluntary. Concerns that vulnerable people - the elderly, lonely, sick or distressed - would feel pressure, real or imagined, to request an early death are widely held.

Pain is not necessarily a part of cancer patient's everyday symptoms. Suffering, which is the emotional reaction to the diagnosis and the disease and the patients' tolerance or intolerance for them, may be a daily phenomenon [8]. Suffering is not directly related to the severity of unrelieved symptoms [9].

Heavy sedation

When optimal therapy has been employed within the limitations of the facilities available the option of heavy sedation remains.

It is important to draw a distinction between the symptomatic relief of pain and distress, cessation of treatment and euthanasia. The difference lies in the intent of the treatment i.e. to kill or to reduce suffering.

ANZCA has a policy statement which clearly states this [10].

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