Pain Management in Emergency & Trauma Department

2nd Edition

2020

MEDICAL CARE QUALITY SECTION
MINISTRY OF HEALTH MALAYSIA

Pain Management in Emergency & Trauma Department. 2nd Edition

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A. INTRODUCTION

1. Pain Management Issues.

i. Pain is the most common reason patients present to Emergency and Trauma Department (ETD)

Studies have shown that pain is one of the most common reasons patients visit the ETD. Pain, as a presenting complaint, account for up to 78 % of visits to the ETD.

ii. The under treatment of pain: Oligoanalgesia

Acute pain has been reported by 60 to 80% of ETD inpatients but pain was found to be frequently under treated. Only 38% of patients evaluated for major trauma in ETD received analgesics. A study in Hospital Kuala Lumpur in 2007 revealed that only 26.5 % of 85 % of patients in moderate and severe pain received analgesia in the ETD despite the pain scores being displayed prominently on the patients' case records.

iii. Importance of pain management

The management of pain is often regarded as less important compared to arriving at diagnosis and treatment proper. Yet physician's primary duty is to comfort, manage and reduce the suffering of patient.

"Any failure to relieve pain is both morally and ethically unacceptable."

"All patients have a RIGHT to pain relief, creating a duty of care."

Royal College of Surgeons and Anaesthetists (1990).

"The relief of pain should be a human right"

Global Day Against Pain, October 11th 2004.

iv. Understanding pain experience

Great steps to improving pain and suffering in a patient starts with understanding what pain is to the patient. We must understand a diverse spectrum of psychological, sociocultural, temporal and situational variables affect how people perceive and express their pain. Age, sex, ethnicity, accompanying psychiatric problems and economic status of the patient are among the factors that may affect the way individual express his/ her complaints. Thus, the painful experience becomes a unique phenomenon for each patient.

v. Respect for patient's pain

Pain is what the patient states it is and physicians must respect this. The patient's pain self-report is the most reliable indicator of the presence and intensity of pain. Physicians should trust patients' subjective report of pain unless there is evidence to the contrary.

vi. Difference in perception of pain among patients and physician

In order to improve pain management, first we must recognize that currently there is a gap between how physician and patients perceived pain. It has been shown that physicians as well as other health care providers consistently underestimate patients' pain. In a comparative study done in ETD HKL, it was found that there was a significant difference in the mean pain score of patients and doctors (1.19 ± 1.57), and patients and triageurs (2.44 ± 1.67) where healthcare workers' scores were lower.

vii. Failure to recognize severity of pain

Failure to recognize severity of pain may be due to the fact that we do not ask the patient. Even when asked, we often discredit the response, judging that the pain is less than reported.

viii. Benefits of pain management

Understanding of pain physiology has led to recommendations of early and aggressive analgesic intervention for post-surgical and trauma patients. The goal is not only to reduce the discomfort of pain, but also to interrupt the pain cycle triggered by release of stress hormones. This cycle has been shown to induce a negative physiologic response, which can lead to significant complications, including infection, thrombosis, and dysphoria in the recovery period. Therefore, appropriate analgesic intervention can promote earlier mobilization, shorter hospitalization, and reduced cost, in addition to improved satisfaction.

ix. Timeliness of pain management

It is also important to address pain promptly because patients become increasingly more sensitive to painful stimulus the longer the pain is uncontrolled. Patients in severe pain should be transferred to an area where they can receive appropriate intravenous or rectal analgesia within 20 minutes of arrival.

x. **Ministry of Health Circular 9/2008**

The Emergency Medicine and Trauma Services (EMTS) acknowledged the Ministry of Health (MOH) directive to implement Pain As The Fifth Vital Sign through the circular 9/2008 (*Pekeliling Ketua Pengarah Kesihatan Bilangan 9 Tahun 2008 berkenaan Pelaksanaan Tahap Kesakitan Sebagai Tanda Kelima* (Pain as 5th Vital Sign)). Hence, an initiative to customize pain management in EMTS as front liners in the MOH hospitals was carried out.

2. Pain Management Objectives in EMTS

i. Pain shall be addressed as the fifth vital sign.

ii. Relief of pain is integral to the mission of EMTS.

iii. Health care team members have an ethical obligation to offer pain relief interventions to patients. Pain management is a joint responsibility among the members of the health care team.

iv. Pain management is a collaborative effort that includes ongoing and individualized assessment, planning, intervention, and evaluation of pain and pain relief.

v. Pain will be managed holistically by psychological, non-pharmacological and pharmacological method.

vi. Special attention is paid to special group of patients (e.g. geriatric patients, pregnant ladies and paediatric patients) when assessing and managing pain.

vii. ETD Healthcare professionals have the responsibility to acquire and maintain the knowledge and skills to assess and manage pain effectively.

3. Holistic Pain Management in ETD

Components of Holistic Pain Management:

i. **Patient and non-patient management:**

Holistic pain management in the ETD must care not only for the patient but also for the often stressed and grieving family and friends of the patient.

ii. **Pharmacological**

The use of pharmacological analgesia should be titrated and individualized and made available for patients in pain.

iii. **Non Pharmacological**

Non-pharmacology method such as offering a wheel chair, trolley, ice pack, immobilization, sling, splints, dressing and bandaging is just as important as pharmacological methods

iv. **Psychological Counseling**

An attentive and supportive attitude of listening and explaining why it is painful and how to cope with the pain with techniques such as relaxation exercise or distraction may help to calm the patient.

v. **Reassurance/ consolation**

Patient often needs reassurance and consolation that pain relief can be expected and he or she would be made more comfortable.

vi. **Personal Interaction**

It is very important to communicate and understand each patients' experience of pain with a smile, personal touch and interaction.

4. The Implementation Strategies for Pain Management in EMTS

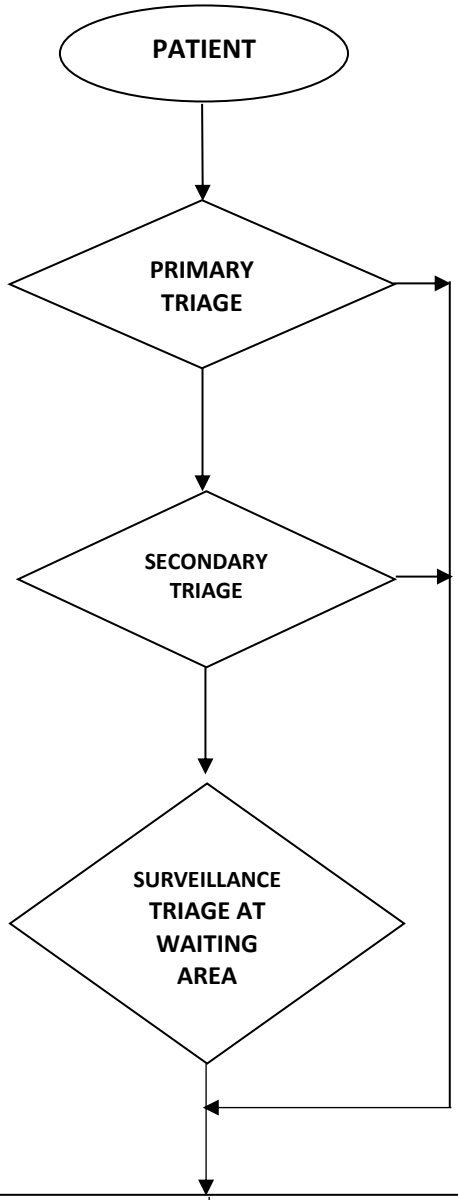
- The ETD is unlike any other department in the hospital, with services rendered in various areas. These bring a unique situation to holistic pain management that requires customization and tailoring to EMTS setting. These management areas include:

    - Triage
        - Primary Triage
        - Secondary Triage
    - Non-Critical/ Green Zone
    - Semi-Critical/ Yellow Zone
    - Critical/ Red Zone
    - Observation ward
    - Procedural rooms

- The management of pain in ETD is unique because:

    - ETD manages more acute pain rather than chronic pain.
    - Patients often come with highly emotional experience of trauma and care must be rendered to manage the complex psychological aspect of pain.
    - Pain management also involves addressing the family members and friends' concern, whom are equally or more stressed than the patient.

ESSENTIAL CLINICAL PATHWAY OF PAIN MANAGEMENT IN ETD

PAIN SCORE As 5th Vital Sign	Arrive at Triage Counter	Holistic Pain Management
First Look 1.Diagnose Pain (Stereotyping) 2. Grading Pain 3. FAQ		**I. Non Pharmacological** **a. Physical** Wheel Chair Trolley Immobilisation Cervical Collar Ice Pack Bandage **b. Psychological** Reassurance Rapport Empathy Eye Contact Listening Gentle Handling Enthusiasm Interaction Suggestion Charisma **II. Pharmacological** Paracetamol NSAIDS
Pain Triage Secondary Assessment 1.Numerical Rating Scale 2. Vital Signs 3. Quick Assessment **PRIORITISE PAIN: Consider as Green 1 (G1)**		
Eagle Eye Observation Review Patient in pain every 30 minutes Educate patient to inform health care personnel if pain score persistently > 4		
GREEN zone	**YELLOW zone**	**RED zone**
Non Critical	**Semi Critical**	**Critical**

GREEN ZONE	YELLOW ZONE	RED ZONE

PAIN ASSESSMENT AND MANAGEMENT

1. Asses and document in Emergency Clerking Sheet
2. Reassessment of Pain Score in **within 30 min** if pain score and treatment given at triage
3. Evaluate pain management regime: Pharmacological and Non Pharmacological
4. Administer pain management if not done
5. Identify causes of pain
6. Consider other causes of distress (e.g. fear of the unfamiliar environment, needle phobia, fear of injury severity, shock of traumatic accident)
7. Please refer to the adult pain scenarios for specific pain management
8. If any patient requiring procedure to refer to Procedural Sedation and Analgesia in ETD guidelines

PAIN MANAGEMENT
(Pharmacological Approach)

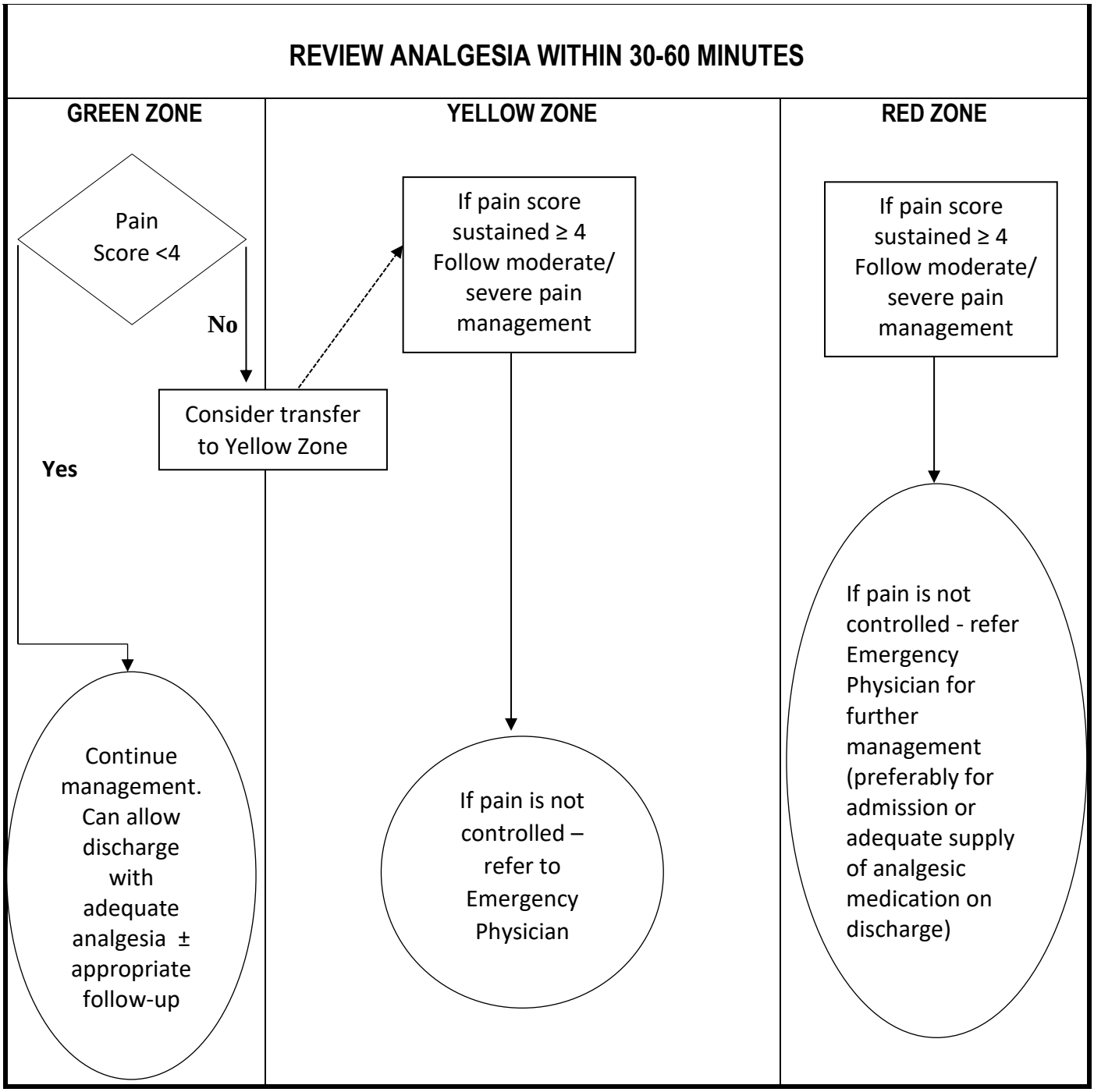
MILD PAIN

Pain Score 1-3
Oral Paracetamol
or/&
NSAIDS or COX_2
Inhibitor

MODERATE PAIN
Pain Score 4-6
Oral/ IV tramadol 50-100g
±Paracetamol 1g QID
± NSAIDs or COX2
Inhibitor
±NSAIDs/COX2

SEVERE PAIN

Pain Score 7-10
(* for acute pain only)
IV Morphine pain protocol
Followed by regular
IV/SC Morphine 5-10mg 4H or
Aqueous Morphine 5-10mg or
± PCM 1g QID
± NSAIDs or COX2 Inhibitor



(Adopted from Cecilia Anthonysamy, Dato' Sri Dr Abu Hassan Asaari; ETD HKL Oct 2008)

B. PAIN MANAGEMENT IN TRIAGE

All patients who come to ETD with pain as the main presentation must be recognised, diagnosed and prioritised. Triaging pain should be done immediately to reduce morbidity and mortality and given priority based on the pain score.

1. Primary Triage

Primary triage is the first triage done on arrival to ETD. The aim is to recognise, diagnose and manage pain. Pain assessment should be done via first look once the patient arrived in front of ETD. Brief targeted history is taken regarding pain. At this level, pain management can be done via non-pharmacological methods (i.e. providing walking sticks, wheelchairs or trolleys to appropriate patients; bandage, ice pack, arm sling, immobilization and cervical collar should be applied if needed). Patient should be reassured accordingly before proceeding to secondary triage.

2. Secondary Triage

This is the second phase of triage where assessment being done subjectively and objectively. The aim is to confirm, grade, prioritize and manage the pain. Brief targeted history is taken. All the vital signs including pain score should be assessed objectively. The pain score should be charted in the pain observation chart. The emotional and cognitive aspects of pain must be recognized and treated. *(Refer table 1)*

Management of pain is done as per pain score using pharmacological or/and non-pharmacological. Patient with moderate to severe pain should be triaged appropriately as per protocol (refer to Essential Clinical Pathway in ETD diagram).

Table 1. Approach to Pain Assessment and Management in Triage

Process of Diagnosing and Triaging Pain:		
Eyeballing	**Verbal**	**Focused Examinations**
Aim: a. To recognize pain by visual stereotyping • Facial Expression / frowning e.g. grimacing • Tears & Crying • Reaction and Behavioral pattern: - Aggressive & Agitated - Shouting - Weak & lethargy • Typical body posture: - Leaning forward → e.g. Pancreatitis - Lying perfectly still → e.g. bowel perforation/ peritonitis - Rolling around in agony→ e.g. bowel/ureteric colic - Limping →e.g. pain of the affected limb - Universal sign of chest pain - Stiffness of the back→ e.g. Back pain - -'Torticollis' → e.g. Neck pain • 5) Obvious Clinical Signs e.g. - Inflammation/abscess - Fracture/swelling - Bruises - Wounds - Red eyes - Sweating - Burn area	Aim: a. To diagnose pain by Frequently Asked Questions (FAQ) b. To manage pain by Non Pharmacological means a. To diagnose pain by FAQ Brief targeted history of pain: • Onset • Site • Radiating pain • Aggravating/Relieving pain • Nature & Progression • Associated symptoms b. Non Pharmacological Pain Management Application of the Art and personality of the triageur: • Reassuring & Counseling • Voice tone – soft & gentle • Correct word & accent • Empathy – feeling, sensitivity • Body language • Facial expressions • Care • Respect patient's feeling Other Non-pharmacological pain management • Bandage, ice pack, arm sling, cervical collar, walking sticks, trolleys, wheelchairs • Immobilization (e.g. use of traction, arm sling)	Aim: a. To confirm pain b. To grade the pain c. To aid in triage/prioritize d. To manage pain: • Pharmacological • Non Pharmacological a. To confirm pain via quick Vital Signs and Examination: • Pulse Rate • Respiratory Rate • Blood Pressure • Temperature • Pain score • Signs e.g. - Tachycardia - High Blood Pressure - Increased Respiratory rate - Others: - Cold clammy peripheries - Dysfunctional State (e.g. not able to walk or stand) - Rapid examination to rule out life threatening condition and to examine the site of pain b. To Grade pain • Use appropriate Pain Scale (NRS, VAS, or FLACC scoring) • Document pain score (in the Vital Sign chart) c. To Aid in Triage • Base on Pain stereotyping d. To Manage pain • Pharmacological/ non Pharmacological • Base on pain score • Base on the types of pain

Administration of Analgesia

The choice of analgesia given is based on the pain score. The analgesia used in triage should be categorized into (refer table 2):

- Medication prescribed by paramedics
- Medication prescribed by doctors

Allergy and past medical history (e.g. liver failure, renal impairment, etc.) should be obtained to avoid preventable side effects especially in special group of patients (paediatric, geriatric and pregnant women). Doctor's consultation should be obtained before administration of certain medications.

Table 2: Examples of Analgesia used in Triage

Analgesia prescribed by Paramedics	Analgesia prescribed by Doctors
- Paracetamol - Ethyl Chloride Spray - Local Analgesia application (EMLA, Lignocaine Gel, Methyl Salicylate ointment)	- NSAID - Paracetamol - Ethyl Chloride Spray - Local Analgesia application (EMLA, Lignocaine Gel, Methyl salicylate ointment)

3. Surveillance Triage

Surveillance triage is done in Green waiting area to ensure the continuity of care and to reassess the effectiveness of pain management given. Pain reassessment and charting should be done by a trained staff, and the regular interval based on the onset of the drug actions. Patient in severe pain should be up-triaged for rapid de-escalation of pain. Wait management should be applied in the waiting area to further ease the patient's pain (see Table 3).

Table 3: Wait Management and Non-Pharmacological Pain Management In Non-Critical Waiting Area

1. Adequate Waiting Area
2. Ideal "Wait Management Concept"
    - Spacious and good ventilation (fans, air-conditioning, room perfume/aromatherapy)
    - Proper and comfortable chair
    - Entertainment (Television, soft calming music)
    - Children play area
    - Breast feeding room
    - Small corner library for reading materials
    - Good PA System and regular housekeeping announcements
    - Observation Counter
    - Water Cooler to provide drinks
    - Regular pain re-assessment and analgesia accordingly

C. ADULT PAIN SCENARIOS

1. Gout

Key points:

i. There is controversy over the respective roles of NSAIDs, corticosteroids and colchicine for gout.
ii. There is evidence that NSAIDs and colchicine are **effective first line analgesics for acute gout attacks**.
iii. Corticosteroids such as prednisolone may be preferred for patients with renal impairment or complex medical problems.
iv. Colchicine has a low therapeutic index and is a potent cellular toxin in overdose.
v. Given the recurrent nature of gout and the likelihood of previous use of colchicine in a given patient, the ED provider may find it useful to ask if the drug has been efficacious in the past thus can be considered for repeat use.

Analgesic Technique:

NSAIDS

when NSAIDs are contraindicated or ineffective, Colchicine 1000 micrograms orally, then 500 micrograms 1 hour later
(maximum 1500 micrograms per course) ideally within 12 hours of acute episode

Do not repeat the course within 3 days.

In renal dysfunction (CrCL< 30mL/min) do not repeat course within 2 weeks.

Consider use of prednisolone when NSAIDs and colchicine are contraindicated or ineffective

Prednisolone 50mg orally daily (for 5 days then review)
Consider prescribing H2 antagonist/ PPI if patient at high risk for Upper Gastrointestinal bleeding

If a Pain Score ≥4, please refer to the Analgesic Ladder for Acute Pain Management (Appendix 1).

Disposition:

i. Pain free discharge*
ii. Referral to KK/ Primary team for further long term follow up

2. Herpes zoster

Key points:

i. Antivirals commenced within 72 hours of onset of the rash reduces duration of pain, duration of rash and reduces ophthalmic complications.
ii. Herpes Zoster therapy and associated pain management should be treated early and prompt treatment of acute herpes zoster decreases the risk of Post Herpetic Neuralgia development and reduces its severity.

Antiviral Therapy:

If within 72 hours of onset of rash, use:

Acyclovir 20mg/kg (up to 800mg) orally 5 times a day for 7 days

Analgesic Techniques:

Paracetamol 1g orally 4 hourly prn (to a maximum dose of 6g per 24-hour period)

and/or

Oral Tramadol ± NSAIDs / COX-2

If a Pain Score ≥4, please refer to the Analgesic Ladder for Acute Pain Management (Appendix 1).

Disposition:

i. Refer to Medical/ Dermatology Team for definitive management
ii. Consider early referral to Pain Specialist to prevent progression to chronic pain
iii. Pain free discharge*

3. Migraine (common and classic)

The International Headache Society classifies a headache as a common migraine when:

i. the pain has at least two of the following features (PUMA);
   - pulsatile
   - unilateral
   - moderate to severe
   - aggravated by movement

ii. there is at least one of the following associated symptoms:
   - nausea
   - vomiting
   - photophobia
   - phonophobia

iii. the headache lasts for between 4 and 72 hours

iv. no evidence of any other diseases that may cause these symptoms.

In addition, classic migraine can be diagnosed when at least three of the following symptoms occur:

i. one or more completely reversible aura symptoms.
ii. aura symptoms include: alterations in vision; numbness or tingling in the face, arm,
iii. or hand on one side of the body; muscular weakness or mild paralysis on one side of the body; and/or difficulty speaking or loss of speech
iv. at least one aura symptom develops gradually over > 4 minutes
v. two or more symptoms that occur at the same time
vi. no aura symptom lasts > 1 hour
vii. headache follows aura within 1 hour.

Red flags for headache include:

i. Sudden onset of severe headache especially if associated with confusion, drowsiness, vomiting or neurological signs (e.g. consider subarachnoid, intracerebral haemorrhage, dissection)
ii. Recent onset with fever, confusion or drowsiness (e.g. consider meningitis, encephalitis)
iii. Age > 50 years (increased rate of tumours, temporal arteritis, glaucoma, subdural haemorrhage and herpes zoster)
iv. Trauma.

Analgesic Techniques:

Once a diagnosis of migraine has been made and there are no “red flags”, use:

Paracetamol

And/or

NSAID or COX-2

And/or

Metoclopramide 10mg IV

If this fails / has failed OR for severe pain or If a Pain Score ≥4 triage patient to yellow/Red zone (Appendix 1).

Manage according to moderate and severe pain protocol

Disposition:

i. Pain free discharge*
ii. Refer to Internal Medicine Department,

4. Tension headache

Analgesic Technique:

Paracetamol

and/or

NSAIDs or COX-2 inhibitor

Consider (if unable to tolerate orally or pain score ≥4 + availability)

Paracetamol can be given IV 1g 6 hourly prn

*assess hydration status and manage accordingly

If a Pain Score ≥4, please refer to the Analgesic Ladder for Acute Pain Management (Appendix 1).

Disposition:

i. Pain free discharge*,

5. Renal colic

Key points:

i. Analgesia does not hinder the diagnostic process in abdominal pain.
ii. Non-selective NSAIDs and opioids provide effective analgesia for renal colic.
iii. **The use of pethidine should be avoided in favour of other opioids**.

Analgesic Techniques:

For severe pain use:

IV Morphine Pain Protocol (Appendix 2).

If morphine is contraindicated, consider

Fentanyl at 25 to 50 micrograms IV as initial equivalent dose.

and

NSAID or COX-2 inhibitor

For moderate pain use:

Tramadol

with or without

NSAID or COX-2 inhibitor

NSAIDS should be used with caution, if at all, in the elderly or in the presence of renal disease or peptic ulcer disease.

If a Pain Score ≥4 triage patient to yellow/Red zone, manage according to moderate and severe pain protocol (Appendix 1).

Disposition:

i. Pain free discharge*

6. Soft tissue injury

Key points:

i. Regular paracetamol, and then if ineffective, NSAIDS may be used for musculoskeletal pain.
ii. NSAIDs if used for acute musculoskeletal injury should be used short term.
iii. Short term oral weak opioids may be required.

Analgesic Techniques:

For severe pain use:

IV Morphine Pain Protocol (Appendix 2).

with

Paracetamol 1g IV (if available) or oral 4 hourly prn (to a maximum dose of 4g per 24 hour period)

and/or

NSAIDs or COX-2 inhibitor

For moderate pain use:

Paracetamol 1g orally 4 hourly prn (to a maximum dose of 4g per 24 hour period)

and/or

NSAIDs or COX-2 inhibitor

7. Abdominal pain

Key points:
Analgesia does not hinder the diagnostic process in abdominal pain.

Analgesic Technique:

For severe pain use:

IV Morphine Pain Protocol (Appendix 2).

If morphine is contraindicated, consider

Fentanyl at 25 to 50 micrograms IV as initial equivalent dose.

And

Paracetamol 1g IV (if available) 4 hourly prn (to a maximum dose of 4g per 24 hour period)

For moderate pain use:

Paracetamol 1g orally 4 hourly prn (to a maximum dose of 4g per 24 hour period)

If the oral and rectal routes are contraindicated,

Tramadol IV/SC 50-100mg 6-8 hourly prn (to a maximum dose of 400mg per 24 hour period)

Disposition:

i. Consider referral to Gastroenterologist/ General Surgeon if recurrent episodes of acute dyspepsia as outpatient.
ii. Pain free discharge*

8. Back pain (acute)

Key points:

i. Simple analgesics and physiotherapy referral should be considered for all patients with back pain of musculoskeletal origin.
ii. Postural advice, minimizing bed rest, staying active and heat wrap therapy are effective in low back pain.
iii. Spinal pathology such as osteoarthritis, spondylosis, bulging discs and canal stenosis are often asymptomatic and may not be the cause of the pain.
iv. Please refer to **The Malaysian Low Back Pain Management Guidelines** as well.

Red Flags are features of the presentation that suggest a potentially serious condition.

In acute back pain these can include:

i. Symptoms or signs of infection or risk factors for infection (fever, immunosuppression, steroid use and history of IV drug use)
ii. History of trauma (this includes minor trauma in the elderly, osteoporotic or those on corticosteroids)
iii. History of malignancy or recent unexplained weight loss
iv. Neurological signs or Cauda Equina Syndrome
v. Age greater than 50 years.

Analgesics Technique:

For severe pain use:

IV Morphine Pain Protocol (Appendix 2).

and

Paracetamol 1g orally 4 hourly prn (to a maximum dose of 4g per 24 hour period)

and/or

NSAIDs or COX-2 inhibitor

For moderate pain use:

Paracetamol 1g orally 4 hourly prn (to a maximum dose of 4g per 24 hour period)

and/or

NSAIDs or COX-2 inhibitor

Disposition:

i. Pain free discharge*.
ii. Consider referral to Primary Team/ Physiotherapy

9. Burns

Key points:

i. Titrated boluses of IV morphine will most likely be required for effective analgesia in acute severe burns.
ii. Opioid dose requirements will typically be higher for burns patients than for other emergency situations.
iii. Non-pharmacological interventions such as cooling and covering are important pain control measures.

Analgesic Techniques:

For severe pain use:

IV Morphine Pain Protocol (Appendix 1).

If morphine is contraindicated, consider

Fentanyl at 25 to 50 micrograms IV as initial equivalent dose.

And

Paracetamol 1g IV (if available)/ Oral 4 hourly prn (to a maximum dose of 4g per 24 hour period)

For moderate pain use:

Paracetamol 1g orally 4 hourly prn (to a maximum dose of 4g per 24 hour period)

If the oral and rectal routes are contraindicated,

Paracetamol can be given IV 1g 6 hourly

Disposition:

i. Pain free discharge*
ii. Consider referral to Plastic/ General Surgeon

10. Cardiac pain

Key points:

i. Patients presenting with cardiac chest pain should receive glyceryl trinitrate (GTN) and morphine
ii. Therapies to ameliorate coronary ischaemia such as beta-blockers and reperfusion therapies may also reduce pain.

Management and Analgesia Technique:

Aspirin 300mg oral initial dose

and

Glyceryl trinitrate (GTN) sublingual spray 400 micrograms

or

Sublingual tablet 0.5 mg

Repeat every 5 minutes as needed and if tolerated (monitor for hypotension) to a maximum of 3 doses

with or without

IV Morphine ain Protocol (Appendix 2).

If morphine is contraindicated, consider

Fentanyl at 25 to 50 micrograms IV as initial equivalent dose.

11. Dental Pain

Key points:

i. Evidence for dental pain management is largely based on tooth extraction research.
ii. Paracetamol, NSAIDs and tramadol provide effective analgesia for acute dental pain.
iii. Dental nerve block provides effective analgesia for acute dental pain.

Analgesics Technique:

For severe pain use:

IV Morphine Pain Protocol (Appendix 2).

If morphine is contraindicated, consider

Fentanyl at 25 to 50 micrograms IV as initial equivalent dose.

and/or

NSAIDs or COX-2 inhibitor

For moderate pain use:

Paracetamol 1g orally 4 hourly prn (to a maximum dose of 4g per 24 hour period)

or

NSAIDs or COX-2 inhibitor

Disposition:

i. Refer to Dental team
ii. Pain free discharge*

12. Fractures and dislocation

Key points:

i. Immobilisation, resting the injured site, ice and elevation of a suspected fracture are important pain control measures.
ii. Femoral nerve block in combination with IV opioids is more effective than IV opioids alone in treating pain from fractured neck of femur.
iii. Anticipate procedures where some movement is required, such as x-ray, and ensure adequate analgesic cover.

Analgesics Techniques:

For severe pain use:

IV Morphine Pain Protocol (Appendix 2).

If morphine is contraindicated, consider

Fentanyl at 25 to 50 micrograms IV as initial equivalent dose.

And/ Or

Paracetamol can be given IV/ Oral 1g 6 hourly

And/ Or

NSAIDs or COX-2

For moderate pain use:

Paracetamol 1g orally 4 hourly prn (to a maximum dose of 4g per 24 hour period)

And/ Or

NSAIDs or COX-2 inhibitor

If the oral and rectal routes are contraindicated,

Paracetamol can be given IV 1g 6 hourly

For reduction of dislocations:

i. To facilitate reduction of dislocations of major joints, refer to Procedural Pain Management in Emergency Department
ii. These techniques should only be performed in a monitored clinical area with sufficient staffing levels by clinicians with advanced airway skills and specific training in the use of these medications.

13. Abdominal Aortic Aneurysm

Key Points:

i. Treating pain in patients with suspected ruptured AAA, the most important consideration is the effect the analgesic will have on the patient's haemodynamic status.
ii. Opioid in small titrated doses, are the analgesics recommended by experts in AAA pain relief.
iii. Hypotension is much less likely to occur with fentanyl since this agent does not cause the histamine release often associated with morphine.

Analgesic Techniques:

Severe Pain

Fentanyl (initial dose 50 to 100 mcg IV, then titrated)

Or

IV Morphine Pain Protocol (Appendix 2).

Disposition:

i. Refer to Vascular/ General Surgeon

14. Biliary Tract Pain

Key Points:

i. There are no significant differences between morphine and other pure mu receptor agonists.
ii. NSAIDs provide good analgesic effect, lack untoward effects on biliary tract pressure, and (perhaps through anti-inflammatory activity) seem to reduce the rate of progression from uncomplicated biliary colic to acute cholecystitis.

Analgesics Techniques:

Severe Pain:

IV Morphine Pain Protocol (Appendix 2).

Or

NSAIDs or COX-2 inhibitor

Disposition:

i. Consider referral to General Surgeon
ii. Pain free discharge*

15. Bites and stings: Marine

Key Points:

i. Marine envenomation can result from discharging nematocysts (e.g. jellyfish, fire coral), puncturing spines (e.g. sea urchins, stingrays), or actual bites (e.g. blue octopus, sea snakes).
ii. For the jellyfish (Cnidaria or Coelenterates) envenomation, hot water immersion (40 to 45 degree Celsius via immersion or shower, for up to 90 minutes), can inactivate venom and achieve better pain relief than alternative approaches such as acetic acid, papain and opioids).
iii. Whether considering physical interventions (e.g. warm water immersion), topical therapies (e.g. acetic acid dousing), or IV drug therapy (e.g. with antivenom), treatment for different marine envenomation, even though from different members of the same genus, can vary significantly.

Analgesics Techniques:

First line:

Warm water immersion or shower (40 to 45 degree Celsius, as tolerated for 90 minutes)

J**ellyfish**: **Acetic acid dousing with 4-5% solution household vinegar**

And/ Or

IV Morphine Pain Protocol (Appendix 2).

Special Cases:

Antivenom available: Consider for intractable pain or severe toxicity

Irukandji-like syndrome:

Magnesium (0.05 g/kg IV, maximum 2.5 g over 20-30 minutes, with repeat dosing and infusion rates guided by side effects and magnesium levels)

Benzodiazepines: Diazepam 5-10 mg IV 4 H for cramping

Failure of acetic acid, especially for stings of the sea nettle:

Slurry of bicarbonate (baking soda) in water

Note:

Pain Free Discharge* *consists of the following:*

i. Referral to appropriate discipline for long term management

ii. Acceptable pain score (pain score < 4) upon discharge

iii. Adequate analgesic medication

D. PROCEDURAL SEDATION AND ANALGESIA (PSA) IN EMERGENCY AND TRAUMA DEPARTMENT (ETD)

1. Introduction

i. Various procedures performed in ETD has grown exponentially over the last several decades. Performing such procedures may produce pain to the patients and must be addressed properly by the healthcare providers. This can be achieved by considering the goals of pain management and determining if a particular patient requires any intervention during a procedure to prevent the pain; by using both non-pharmacological as well as pharmacological approaches.

ii. The goals during a procedure that must be fulfilled:

- Patient safety;
- Minimizing pain and anxiety associated with procedure;
- Minimizing patient's motion during the procedure;
- Maximizing the chance of success of a procedure; and returning the patient to pre-sedation state as quickly as possible

iii. When performing a procedure, the healthcare personnel should be:

- Professional
- Sensitive
- Thorough
- Gentle
- Thoughtful
- Efficient

iv. With the introduction of shorter-acting sedatives for sedation and opioids for pain control, specific reversal agents for both opioids and benzodiazepines, and the availability of non-invasive monitoring equipment, procedural sedation can now be safely administered in ETD settings.

2. Identifying Procedural Pain

Procedural pain can be encountered in various situations:

i. Examination process

- Often seen during mobilization of patient
- Poor bedside manners and uncaring attitude may contribute to this type of pain.

ii. Diagnostic processes that can produce pain*:*

- Blood taking
- X-rays, CT scan
- Ultrasound
- Maneuvering of body parts
- Mobilization and transportation of patient

iii. Therapeutic process causing pain may include the following:

- IV, IM, SC injections
- Procedure – catheterization, close manual reduction (CMR) etc.
- Lavage
- Foreign body removal
- Suturing
- Wound dressing

3. Steps in managing procedural sedation and analgesia

Before the Procedure:

i. Establish a plan for managing patient comfort if the procedure is likely to produce pain or anxiety.

- Select appropriate pharmacologic and non-pharmacologic interventions.
- Develop a plan to help the patient cope during the procedure (e.g., distraction, breathing, relaxation)
- Consider procedural sedation if:
  - The procedure is believed to be significantly painful.
  - Immobility of the patient is required for a longer period of time.

- The patient expresses great concern or distress at the thought of being awake during the procedure.
- Special groups of patient e.g. paediatric patient, patient with cognitive impairment

- If procedural sedation is in the best interest of the patient but cannot be administered in the current setting, consider transfer to an alternate location where the administration of procedural sedation is possible (e.g. from yellow zone to the red zone, or from ETD to the operation theatre)

- Consider pre-emptive analgesia.

ii. Prepare

General Preparation

- Assess patient's condition and vital signs.

- Explanation to patient and/or family:
  - About the procedure to the patient
  - Patient's right to request additional pain relief
  - Pain score target during the procedure should be less than 4
  - Acknowledge patient's fears/concerns and modify the comfort management plan accordingly.

- Obtain written consent as appropriate

- Agree on optimal patient's position

- Ensure that medications are administered to allow sufficient time for effectiveness before the procedure.

- Prepare the health care team:
  - Know the procedure specifics:
    - What will be done?
    - How long it is anticipated to take?
    - What kind of pain is anticipated?
  - Identify someone to lead the distraction and coping techniques so the patient is not confused or over stimulated (if multiple staff are present)
  - Know how often the procedure will need to be repeated

Preparation for procedural under sedation

- Assess the patient American Society of Anaesthesiologist (ASA) physical status (see Table 4). PSA in ETD is for ASA 1 and ASA 2 patients only.
- Ensure patient is Nil by mouth (NBM) after decision for PSA is made.
- Consider premedication (e.g. metoclopramide, ranitidine) base on the assessment by the doctor.

Table 4: American Society of Anaesthesiologist (ASA) physical status classification system

ASA Class 1	Normally healthy patient
ASA Class 2	A patient with mild systemic disease
ASA Class 3	A patient with severe systemic disease that is not incapacitating
ASA Class 4	A patient with an incapacitating severe systemic disease that is a constant threat to life
ASA Class 5	A moribund patient who is not expected to survive for 24 hours with or without operation

During the Procedure:

i. There must be continuous monitoring of pulse rate and oxygen saturation and regular monitoring of depth of sedation (see table 5) and blood pressure throughout the procedure. Depending on the clinical condition of the patient, monitoring of other parameters such as ECG may also be required.

ii. Appropriately trained personnel must be present to monitor the cardiorespiratory status of the patient and be able to immediately respond to the patient should the need arise.

iii. Supplemental oxygen should be administered during the procedure.

iv. The monitoring must be continued into the recovery phase.

v. If pain and/or anxiety are not well controlled during the procedure, ask the health care provider performing the procedure to stop to allow further evaluation to be conducted and the need for additional support (pharmacologic and/or non-pharmacologic) determined.

Table 5: Continuum of Depth of Sedation

	Minimal sedation (Anxiolysis)	Moderate sedation/ analgesia (conscious sedation)	Deep sedation/ analgesia	General anaesthesia
Responsiveness	Normal response to verbal stimulation	Purposeful response to verbal or tactile stimulation	Purposeful response after repeated or painful stimulation	Unarousable even with painful stimulation
Airway	Unaffected	No intervention required	Intervention may be required	Intervention often required
Spontaneous Ventilation	Unaffected	Adequate	May be inadequate	Frequently inadequate
Cardiovascular function	Unaffected	Usually maintained	Usually maintained	May be impaired

After the Procedure:

i. Continue to monitor vital sign. If opioid is being used, patient need to be observed until patient regain full consciousness.

ii. Develop and implement a comfort management plan for after the procedure, because the pain resulting from the procedure itself may not subside when the procedure is completed and must be treated appropriately.

- Multimodal (pharmacologic including opioids and adjuvants, and non-pharmacologic) treatment may be indicated.

- The comfort plan should include care in the event the patient is no longer in the health care setting (i.e., home) after the procedure.

iii. The patient must be discharged into the care of a responsible adult, who may be given written instructions.

iv. Referral letter to the respective department/nearest clinic as appropriate.

Documentation

Documentation of the following should be done for all procedures and must be kept as part of the patient's records.

a. names of staff involved in the procedure
b. history, examination and investigation findings
c. dosages of drugs and their timings
d. vital signs: Pulse rate, oxygen saturation and blood pressure: pre, intra and post-procedure.

4. Management of pain related to procedures commonly performed in ETD

There is no single agent, or combination of agents that can be recommended for every patient or sedation procedure. Sedative drugs should be carefully titrated to effect rather than using a fixed dosage. Clinicians must weigh the relative needs for pain control (analgesia), sedation, and the potential risks, benefits, and alternatives when individualizing their plan for patient sedation.

i. Close manual reduction (CMR) for fracture/dislocation

Important points:

- Local application of ice, elevation and splinting of the affected limb are effective forms of analgesia for known or suspected fractures.
- Patients should be reassessed to determine if the dose has been effective and to determine if any adverse effects, especially sedation, have occurred.

Analgesic techniques
Appropriate positioning, distraction, relaxation or other coping strategies ***And*** 1) Local Anaesthesia with/ without sedation 2) Analgesia without sedation • Fentanyl *or* • Morphine 3) Analgesia with sedation • Ketamine with/ without midazolam *or* • Fentanyl and Propofol *or* • Fentanyl and Midazolam

ii. Insertion of chest tube and central venous line

Important points:

- Chest tube insertion is a painful procedure, especially in muscular individuals.
- While a relatively simple procedure, it carries a significant complication rate, reported as between 2% and 10%. While many of these complications are relatively minor, some may require operative intervention.
- Although often performed in emergent conditions, attention to technique in placing the chest tube is vital to avoid complications from the procedure.

Analgesic techniques
Appropriate positioning, distraction, relaxation or other coping strategies ***And*** A combination of intravenous analgesia and local anaesthesia is used for the procedure. ▪ IV morphine (0.05-0.2mg/kg or titrate to effect) or IV fentanyl (1-2 mcg/kg followed by 0.5-1 mcg/kg) ▪ An analgesic dose of ketamine (0.25mg/kg adult) is a good alternative to opioids for chest tube insertion. ▪ For local anaesthesia, titrated dose up to 5mg/kg of lignocaine 1% or 2% may be required. ▪ If expertise available, intercostal block can be considered.

iii. Suturing for laceration wounds

Important points:

- Wherever possible, the least invasive technique of wound closure (skin glue and/or tape strips e.g. steristrips) should be employed as long as cosmetic result is equivalent

Analgesic techniques
Appropriate positioning, distraction, relaxation or other coping strategies ***And*** For local anaesthesia, titrated dose up to 5mg/kg of lignocaine 1% or 2% may be required.

iv. Urethral catheterization

Analgesic techniques
Appropriate positioning (e.g. swaddling), distraction, relaxation or other coping strategies ***And*** Topical Lignocaine lubricant should be used during the procedure ***NB***. 10 minutes is required for Lignocaine gel to take optimal effect

v. Cardioversion and pacing

Important points:

- Advanced cardiac life support (ACLS) guidelines should be followed as indicated.
- Cardioversion is always performed under sedation except if the patient is hemodynamically unstable or if cardiovascular collapse is imminent.
- Pre-procedural preparation such as intravenous access, airway management equipment, sedative agents and a converter/defibrillator monitoring device must be done.

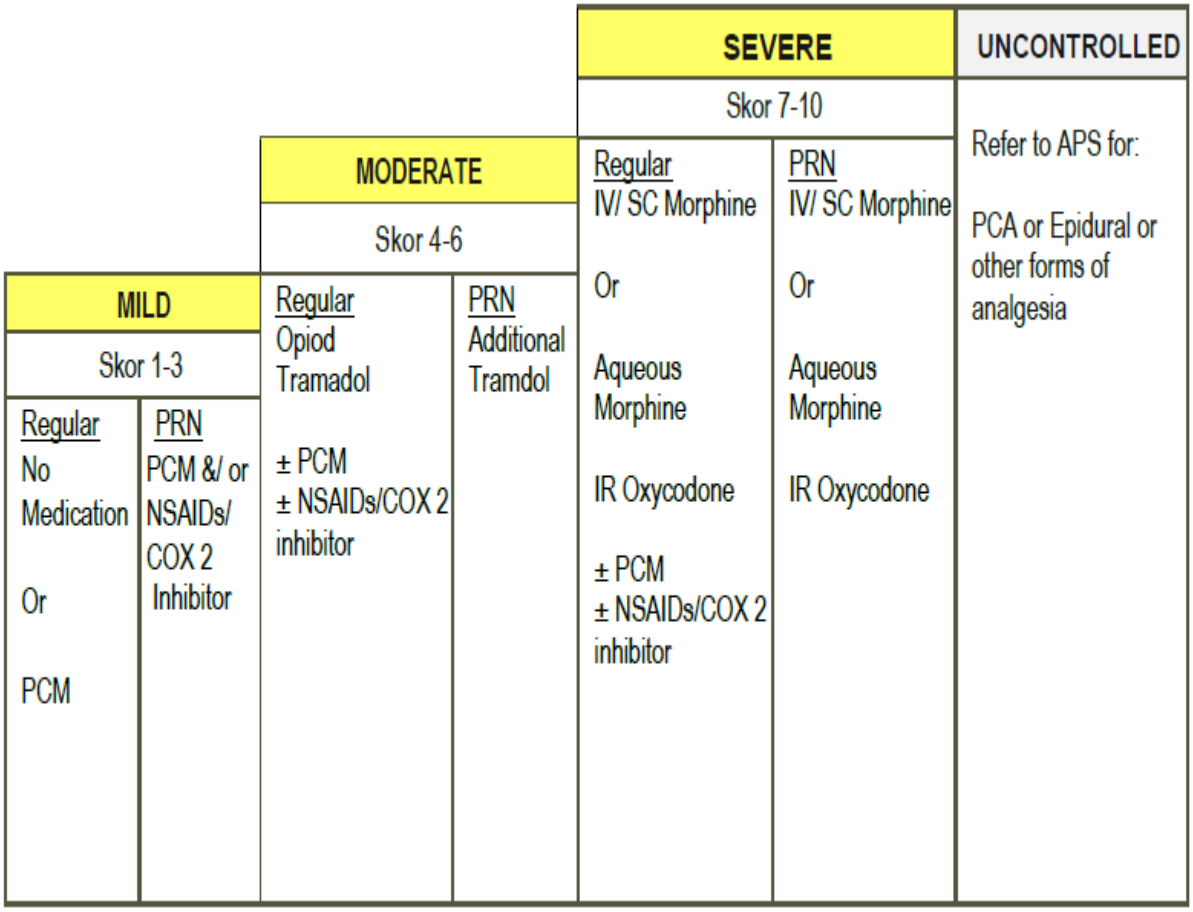
Analgesic techniques
Appropriate positioning, distraction, relaxation or other coping strategies ***And*** Analgesia with sedation i. Ketamine with/ without midazolam or ii. Fentanyl and Midazolam or iii. Fentanyl and Propofol

Table 6: Drug and dose reference

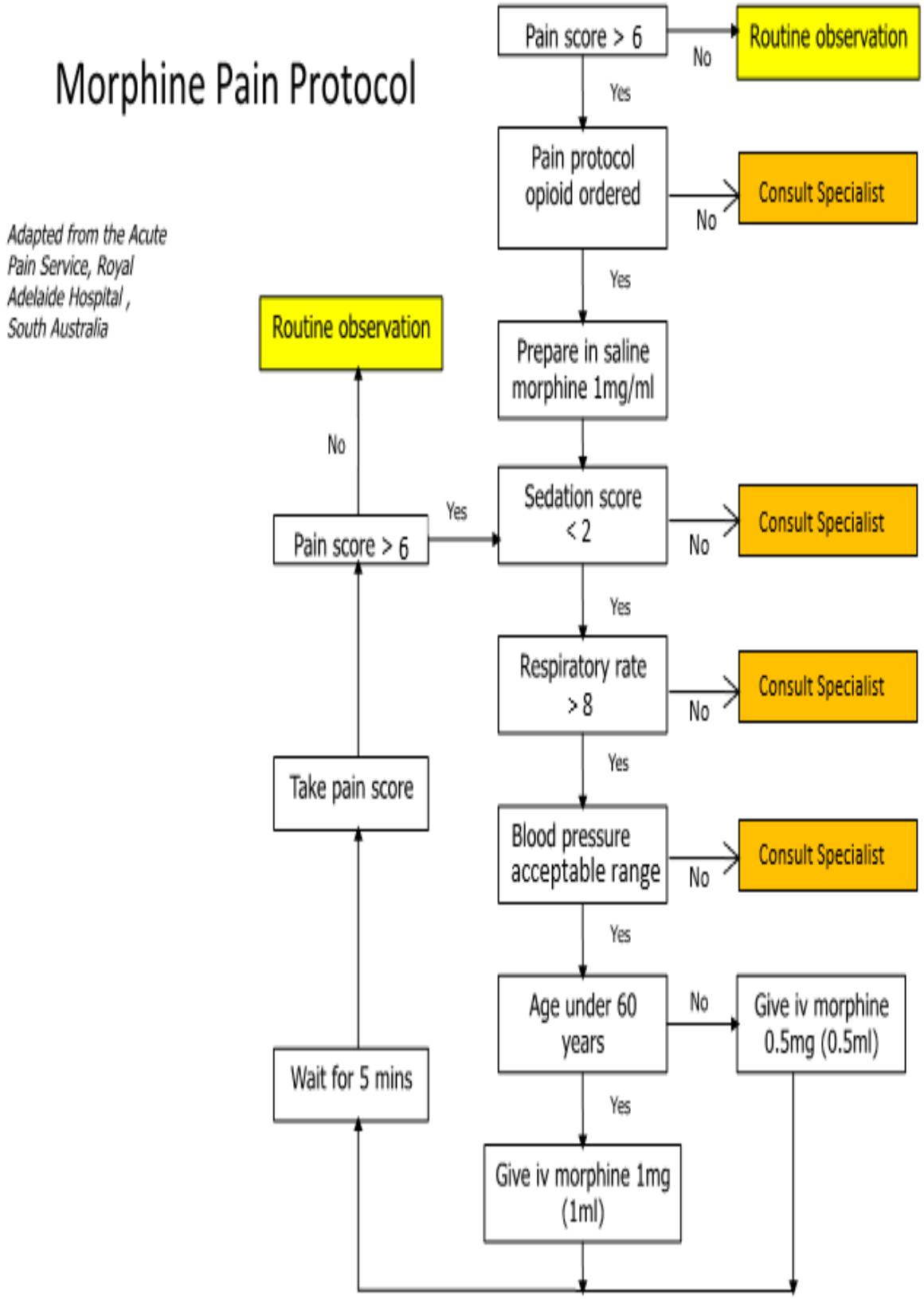
Medication	**Typical adult starting dose and repeat doses. Titrating to effect**	**Dose suggestions in older adults (age 65 and over)**
Fentanyl	1-2 mcg/kg followed by 0.5-1 mcg/kg	0.5 -1mcg/kg followed by 0.25 mcg/kg
Midazolam	0.02-0.03 mg/kg followed by 0.01-0.02 mg/kg	0.02 mg/kg followed by 0.01 mg/kg
Propofol	0.5-1 mg/kg over 1 min followed by 0.5 mg/kg	0.5 mg/kg over 3min followed by 0.25 mg/kg
Ketamine	0.5-1 mg/kg followed by 0.25-0.5 mg/kg	0.25-0.5 mg/kg followed by 0.25 mg/kg
Notes: Typical adult medication doses and suggestions for older adults. Agents are typically given as a bolus doses if needed, titrating to needed level of sedation and monitoring for adverse side effects. For most medications, in older patients consider starting at 50-75% of the usual adult dose. This will vary depending on the patient's overall health and status at the time of sedation. There is a paucity of evidence on the subject, so these are general suggestions. Individual patients may require higher or lower doses.		

APPENDICES

Appendix 1: Analgesic Ladder for Acute Pain Management



Appendix 2: Morphine Pain Protocol



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