



# **PROCEDURAL SEDATION AND ANALGESIA IN EMERGENCY AND TRAUMA DEPARTMENT**



**PAIN FREE PROGRAMME | KEMENTERIAN KESIHATAN MALAYSIA | UNIT AUDIT KLINIKAL**

# INTRODUCTION

1. Various procedures performed in the Emergency and Trauma Department (ETD) may produce pain to the patients.
2. Intervention to prevent pain is prudent
3. By using both non-pharmacological as well as pharmacological approaches



# Identifying procedural pain

In order to address procedural pain, steps must be taken to recognize and identify the source of pain



# Disease process

Patient is in pain before the procedure :

1. Fractures
2. Perforated Viscus
3. Painful Joints
4. Abdominal Pain



# Uncaring attitude:

1. Poor patient's handling- rough, disregard pain
2. Disrespect of patient
3. Disregard patient's suffering
4. Poor bedside manners



# Diagnostic processes that can produce pain:

1. Blood taking
2. Maneuvering of body parts
3. Mobilization and transportation of patient



# Therapeutic process causing pain

1. IV branula insertion
2. Urine catheterization
3. Close manual reduction
4. Foreign body removal
5. Suturing
6. Wound dressing



# Pain is often inadequately treated

Studies show that Emergency Physicians inadequately treat pain in ETD for multiple reasons:

1. Fear of over-sedation
2. Fear of adverse events
3. Inadequate knowledge
4. Inadequate dosing
5. Insufficient time
6. Insufficient resources

Grant PS. Analgesia delivery in the Emergency Department. Am J Emerg Med, 2006;24(7):806–809



# When performing a procedure, the healthcare personnel should be:

1. Professional
2. Sensitive
3. Thorough
4. Gentle
5. Thoughtful
6. Efficient

**PAIN MANAGEMENT:**

**ABCDE**

**Assess** Assess for pain and ask about the pain

**Believe** Believe the patient's account of pain description

**Choose** Choose the most appropriate pain control options.

**Deliver** Deliver possible therapeutic interventions in a timely, logical and coordinated manner.

**Empower** Empower and enable the patient to have pain control.

[www.nursebuff.com](http://www.nursebuff.com)

# Procedural Sedation And Analgesia (PSA)

1. PSA is defined as the use of pharmacologic agents to provide anxiolysis, analgesia, sedation or motor control during procedures or diagnostic tests.
2. PSA reduces the discomfort, apprehension and potential unpleasant memories associated with procedures and facilitates improved performance.

Procedural Sedation and Analgesia (PSA) for Adults and Children in the Emergency Setting, University of Florida College of Medicine -Jacksonville  
Department of Emergency Medicine, Pain Management and Assessment Initiative (PAMI): A Patient Safety Project May 2016



# Consider procedural sedation if:

1. The procedure is believed to be significantly painful.
2. Immobility of the patient is required for a longer period of time.
3. The patient expresses great concern or distress at the thought of being awake during the procedure.
4. Special groups of patient e.g. pediatrics patient, patient with cognitive impairment

# When to consider Procedural Sedation and Analgesia

Fracture Reduction and Orthopedics Procedure	Burn and Wound Debridement	Cardioversion and Pacing
Lumbar Puncture	Chest Tube Insertion	Radiographic studies in Uncooperative and Agitated Patients
Abscess Incision and Drainage	Suturing of Laceration Wound	Foreign Body Removal

Adapted from Procedural Sedation and Analgesia (PSA) for Adults and Children in the Emergency Setting, University of Florida College of Medicine -Jacksonville Department of Emergency Medicine, Pain Management and Assessment Initiative (PAMI): A Patient Safety Project May 2016

# Steps in managing procedural pain

**Before the Procedure:**

- 1. Plan for managing patient's pain**



# Pre-requisite to performing PSA

- Supervised by Emergency Physician
- Trained in Airway Management and Ventilation





# Monitoring is Mandatory if patient is to be sedated

- Procedural sedation is best conducted in a monitored environment e.g. the red zone
- BP, PR, RR, SPO2 and ECG monitoring **MUST** be available
- Resuscitation trolley, Airway equipment, O2 supply must be checked, ready and nearby.



# Prepare the healthcare team:

- Know the procedure specifics:
  - What will be done?
  - How long it is anticipated to take?
  - Severity of pain anticipated?
- Prepare drugs, check dose per body weight.
- If sedation is expected, check monitoring equipment
- Appoint personnel to monitor vital sign every 5 minutes and document

# Prepare the patient:

- Assess patient's condition and vital signs.
- Explanation to Patient and/or family:
  - About the procedure, pain, and pain management plan
  - Inform the patient that she/he has a right to request additional pain relief
- Pain score target during the procedure should be  $< 4$
- Acknowledge patient's concerns and modify the comfort management plan accordingly.



# Prepare the patient:

- Ask for any allergies
- Agree on optimal patient's position
- Discuss with patient relaxation, distraction and coping techniques based on patient preference and experience.
- Give pre-procedure analgesia
- Ensure that medications are administered to allow sufficient time for effectiveness before the procedure

# Preparation for procedure under sedation

- **Assessment of the patient (ASA 1 and ASA 2 only)**
  - **ASA Class 1 : Normally healthy patient**
  - **ASA Class 2 : A patient with mild systemic disease**
- **Ensure to check for difficult airway before procedure**
- **Take an informed consent (procedures and sedation) after explaining what is PSA, risk and benefit**

# Pre-requisite to performing PSA

What is PSA process	Benefits of PSA
<ul style="list-style-type: none"><li>• IV cannula and drip</li><li>• Monitoring</li><li>• Medication to sedate and pain relief</li><li>• More monitoring post procedure</li></ul>	<ul style="list-style-type: none"><li>• Minimize pain &amp; discomfort</li><li>• Control movement</li><li>• Minimize psychological trauma/anxiety</li><li>• Maximize amnesia</li></ul>



# Explain Adverse Events before Informed Consent

## Pocket card with summary of the information

Adult Procedural Sedation Adverse Events		
Adverse Event	Incidence (per 1,000)	Percentage
<b>Respiratory Events</b>		
Laryngospasm	4.2	0.4
Intubation	1.6	0.2
Aspiration	1.2	0.1
Hypoxia	40.2	4
Apnea	12.4	1
<b>Other Events</b>		
Hypotension	15.2	2
Vomiting	16.4	2
Agitation	9.8	1
<b>Legend</b>		
	Serious	
	Common / Potentially serious	
	Common / Non-serious	

- Severe adverse events requiring emergent medical intervention were rare.
- Apnea was more frequent with midazolam
- Hypoxia was less frequent in patients who received ketamine/propofol compared to other combinations.

Bellolio et al. Undergoing Procedural Sedation in the Emergency Department: A Systematic Review and Meta-analysis. Acad Emerg Med. 2016 Feb;23(2):119-34. Incidence of Adverse Events in Adults

## During the Procedure:

1. Ensure regular monitoring of BP, PR, RR, continuous SPO2 , ECG monitor
2. Document vital signs every 5 minutes
3. Assess depth of sedation before and post procedure
4. If pain is not well controlled during the procedure, ask the health care provider performing the procedure to stop.
5. Evaluate need for additional medication

# Depth of Sedation

**Table: Continuum Depth of Sedation**

	<b>Minimal Sedation (Anxiolysis)</b>	<b>Moderate Sedation/ Analgesia (Conscious Sedation)</b>	<b>Deep Sedation/ Analgesia</b>	<b>General Sedation/ Analgesia</b>
<b>Responsiveness</b>	Normal response to verbal stimulation	Purposeful response to verbal or tactile stimulation	Purposeful response after repeated or painful stimulation	Unarousable even with painful stimulation
<b>Airway</b>	Unaffected	No intervention required	Intervention may be required	Intervention often required
<b>Spontaneous Ventilation</b>	Unaffected	Adequate	May be inadequate	Frequently inadequate
<b>Cardiovascular Function</b>	Unaffected	Usually maintained	Usually maintained	May be impaired

# After the Procedure

1. Continue to monitor vital sign every 5 min x 4, (1st 20 mins), then every 15 mins
2. Complications from sedation such as respiratory depression are most likely to occur within 5 to 10 minutes after administration of IV medication and immediately after the procedure when stimuli associated with the procedure are removed.
3. In studies using fentanyl and diazepam, all episodes of oxygen desaturation occurred within 20 minutes of last drug dose. Thus, monitoring should be especially close during these periods
4. Patient should be monitored till fully conscious, talking and walking

Newman DH, Azer MM, Pitetti RD et al. When is a patient safe for discharge after procedural sedation? The timing of adverse effect events in 1,367 pediatric procedural sedations. *Ann Emerg Med.* 2003;42:627-635.

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# After the Procedure

1. Document the procedure (Performed by, Assisted by, Observed by)
2. Drugs given, time and dose
3. Vital signs pre, during and post procedure
4. Time patient fully conscious, talking, walking
5. Any complication

# Comfort plan post procedure

1. Implement a comfort management plan for after the procedure
2. Because there may be pain post procedure
3. Multimodal (pharmacologic and non-pharmacologic) treatment
4. The comfort plan should include care at home after the procedure
5. Patient must be reviewed by a medical officer before discharge



# **Management of pain related to procedures commonly performed in ETD**

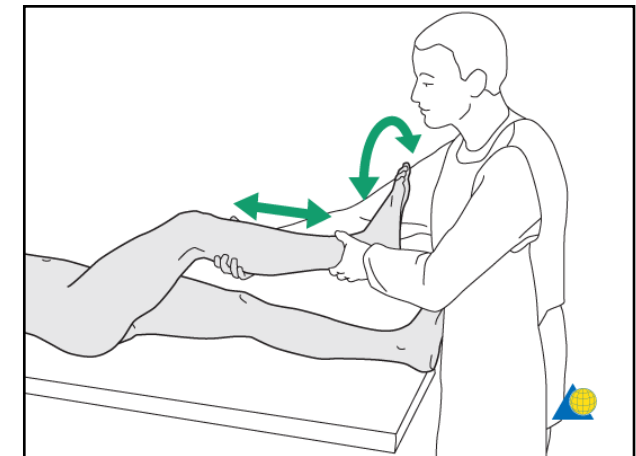
- 1. The choice of medication should be individualized.**
- 2. Weigh the relative needs for analgesia, sedation, and the potential risks, benefits, and alternatives when individualizing their plan for patient sedation.**



# Close manual reduction (CMR)

## 1. Procedural sedation and Analgesia (PSA)

- Fentanyl and Propofol OR
- Ketamine with / without midazolam OR
- Fentanyl and Midazolam



# Insertion of chest tube

1. Chest tube insertion is painful.
2. A combination of intravenous analgesia and local anaesthesia
  - IV morphine : 0.05-0.2mg/kg in titration or
  - IV fentanyl : 1-2 mcg/kg then 0.5-1 mcg/kg or
  - IV ketamine : 0.25mg/kg adult (analgesic dose)

# Lignocaine for LA

	Onset (min)	Duration (min)	Max dose (mg/kg)	Max mg ( ≥70kg person)
Lignocaine (1% or 2%)	2	15-60	3-4mg/kg	200mg (10mL 2 % ) (20mL 1% )

Lignocaine 1% = 1g /100 ml  
= 1000mg / 100ml  
= 10mg /ml

Lignocaine 2% = 2g /100 ml  
= 2000mg / 100ml  
= 20mg /ml

# LA for central venous line insertion

## Short procedure

1. IV Fentanyl
2. Lignocaine LA

# Suturing for laceration wounds

- The least invasive technique of wound repair (skin glue and/or adhesive band) should be used.
- Cyanoacrylate skin glue provides equivalent cosmetic outcomes to suture repair for simple lacerations in children
- For local anesthesia, maximum dose of 3-4 mg/kg of lignocaine 1% is required to infiltrate along the length of the laceration wound on both sides.
- In children with laceration wounds, IV Ketamine can be used safely as PSA



# Urethral catheterization

- Topical Lignocaine lubricant should be used before the procedure
- 10 minutes is required for Lignocaine gel to take optimal effect





# Cardioversion and pacing

- Cardioversion is performed under procedural sedation and analgesia except if the patient is hemodynamically unstable or if cardiovascular collapse is imminent
- Procedural sedation and Analgesia
  - i. Fentanyl and Etomidate or
  - ii. Fentanyl and Midazolam or
  - iii. Fentanyl and Propofol

# Drugs in PSA: Adapted from Emergency Institute NSW

Medication	Dose	On set of Action	Duration of Action	Main Adverse Effects
Fentanyl	1-2 mcg/kg Slow	1 minute	1 hour	Minimal hypotension
Midazolam	0.02 mg/kg 1-2mg slow IV push  with 1mg every 2 minutes	2-5 minutes	20- 40 minutes  2 hours required for full recover	Cautious in elderly , obese  hypotension respiratory depression/apnoea.
Propofol	0.5-1mg/kg IV slow	30-90 seconds	5- 10 minutes	pain on injection apnoea hypotension.
Ketamine	0.5-1 mg/kg IV slow	1 minute	5- 10 minutes	hypertension tachycardia hypersalivation laryngospasm.
Etomidate	0.1-0.2 mg/kg IV slow	15-45 sec	3 - 5 mins	cardiostable (i.e. less likely to cause hypotension)

# Summary

- **Pre- PSA Assessment**
- **Plan the PSA**
- **Take Informed Consent pre- PSA (Procedure & Sedation)**
- **Monitor patient during PSA and post PSA**
- **Know your PSA drugs before you use it**



# THANK YOU



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