Clinical Practice Guidelines

Air Ambulance Victoria

AmbulanceVictoria

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About

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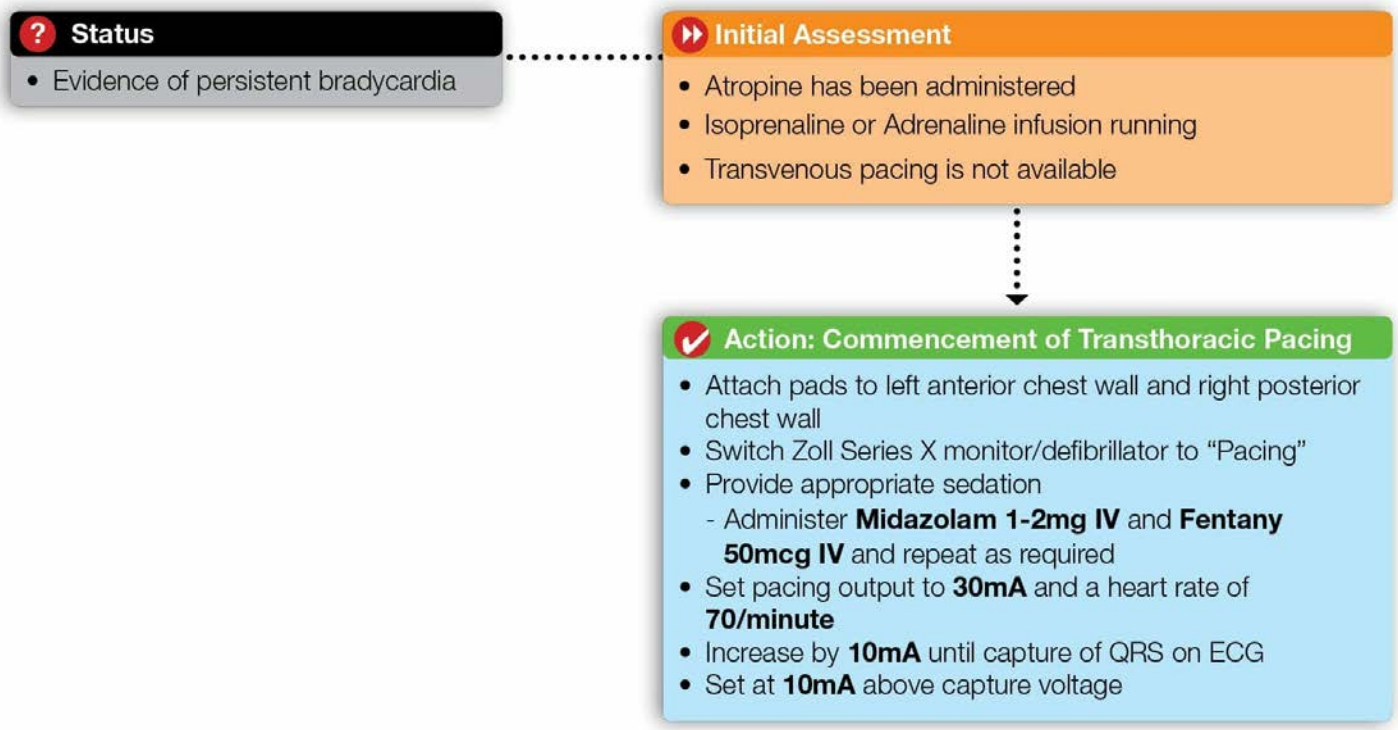
Transthoracic Pacing CPG AAV 03

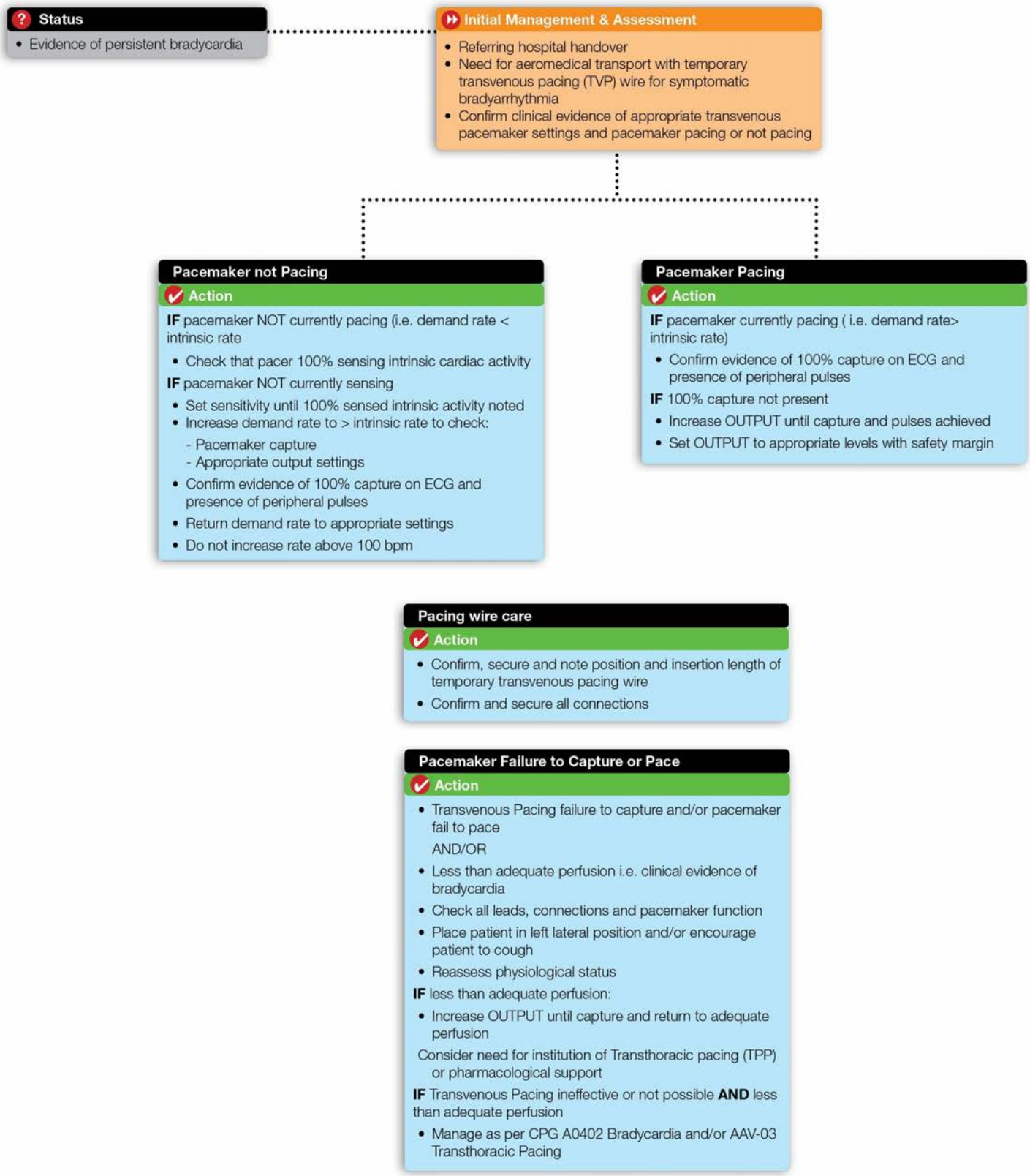
Flowchart



Pacing Wire Care

- In general the OUTPUT setting on the pacemaker should be set at 2 times the THRESHOLD level plus 1mA (i.e. 2 x THRESHOLD(mA) + 1mA)
- Pacing THRESHOLD would usually be determined on consultation with the sending hospital
- In general the SENSITIVITY setting should be set towards the maximum sensitivity (i.e. 0.5mV is the most sensitive)
- If Transthoracic Pacing instituted prior to or during flight consider implications on mission safety and appropriate communication with relevant aircrew/pilot.

Flowchart


Status
• Evidence of persistent bradycardia
Initial Management & Assessment
• Referring hospital handover
• Need for aeromedical transport with temporary transvenous pacing (TVP) wire for symptomatic bradyarrhythmia
• Confirm clinical evidence of appropriate transvenous pacemaker settings and pacemaker pacing or not pacing
Pacemaker not Pacing
Action
IF pacemaker NOT currently pacing (i.e. demand rate < intrinsic rate
• Check that pacer 100% sensing intrinsic cardiac activity
IF pacemaker NOT currently sensing
• Set sensitivity until 100% sensed intrinsic activity noted
• Increase demand rate to > intrinsic rate to check:
- Pacemaker capture
- Appropriate output settings
• Confirm evidence of 100% capture on ECG and presence of peripheral pulses
• Return demand rate to appropriate settings
• Do not increase rate above 100 bpm
Pacemaker Pacing
Action
IF pacemaker currently pacing (i.e. demand rate> intrinsic rate)
• Confirm evidence of 100% capture on ECG and presence of peripheral pulses
IF 100% capture not present
• Increase OUTPUT until capture and pulses achieved
• Set OUTPUT to appropriate levels with safety margin
Pacing wire care
Action
• Confirm, secure and note position and insertion length of temporary transvenous pacing wire
• Confirm and secure all connections
Pacemaker Failure to Capture or Pace
Action
• Transvenous Pacing failure to capture and/or pacemaker fail to pace
AND/OR
• Less than adequate perfusion i.e. clinical evidence of bradycardia
• Check all leads, connections and pacemaker function
• Place patient in left lateral position and/or encourage patient to cough
• Reassess physiological status
IF less than adequate perfusion:
• Increase OUTPUT until capture and return to adequate perfusion
Consider need for institution of Transthoracic pacing (TPP) or pharmacological support
IF Transvenous Pacing ineffective or not possible AND less than adequate perfusion
• Manage as per CPG A0402 Bradycardia and/or AAV-03 Transthoracic Pacing

General Notes

- Multimodal pain relief is recognised as the most effective pathway for efficacious analgesia and limits excessive opiate administration. Unless contraindicated Paracetamol IV should be administered to all trauma patients complaining of pain. Parecoxib, in addition, should be strongly considered for patients with moderate to severe pain unless contraindicated.
- Paracetamol and Parecoxib are slow acting, long lasting agents that provide bridging analgesia between the prehospital and Emergency Department settings.
- The use of Ketamine is not specifically contraindicated in the patient requiring winching. However MFPs must be acutely aware that a dissociated patient can be an inherent safety risk during the winching operation. Ideally patients should be allowed time to return to full consciousness prior to extrication and MFPs should include this potential delay in winch operations planning. Alternatively, other analgesic agents such as Methoxyflurane may be considered for procedural pain relief in the winch setting.
- ALS Flight Paramedics **must** consult with either the clinician or a MFP via the FCC prior to exceeding **Morphine 20 mg IV** or **Fentanyl 200 mcg IV**

Infusions

Morphine Infusion

- **Morphine 30 mg** added to make **30 mL** with **Dextrose 5%** or **Normal Saline**.
- **1 mL/hr = 1 mg/hr**

Fentanyl Infusion

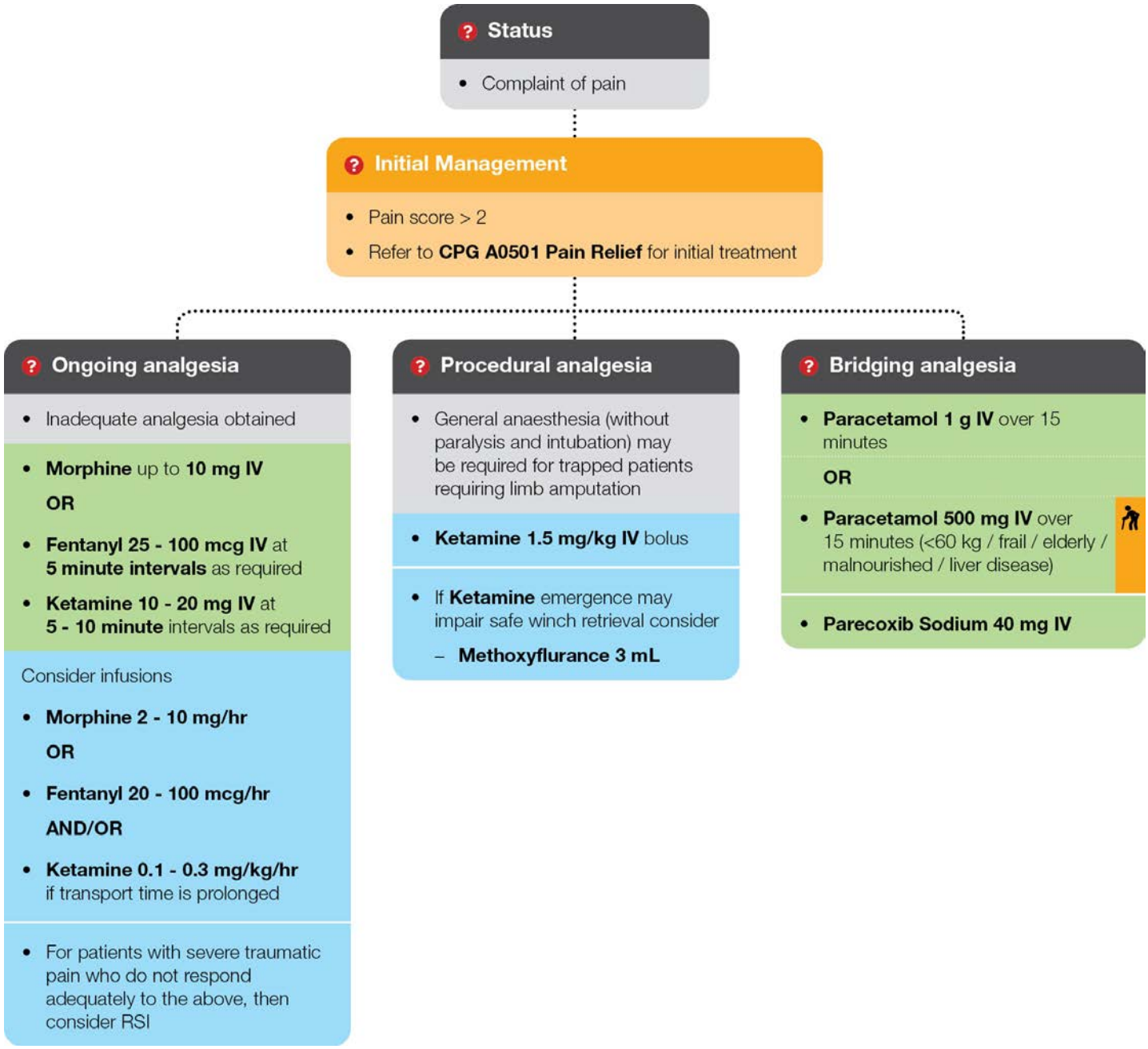
- **Fentanyl 300 mcg** added to make **30 mL** with **Dextrose 5%** or **Normal Saline**
- **1 mL/hr = 10 mcg/hr**

Ketamine Infusion

- **Ketamine 50 mg** added to make **50 mL** with **Dextrose 5%** or **Normal Saline**
- **1 mL/hr = 1 mg/hr**

Ketamine 50 mg may be obtained by adding **50 mg (5 mL)** of the pre-diluted **10 mg/mL Ketamine** solution to **45 mL Dextrose 5%** or **Normal Saline** to make a **1 mg/mL** dilution

Flowchart



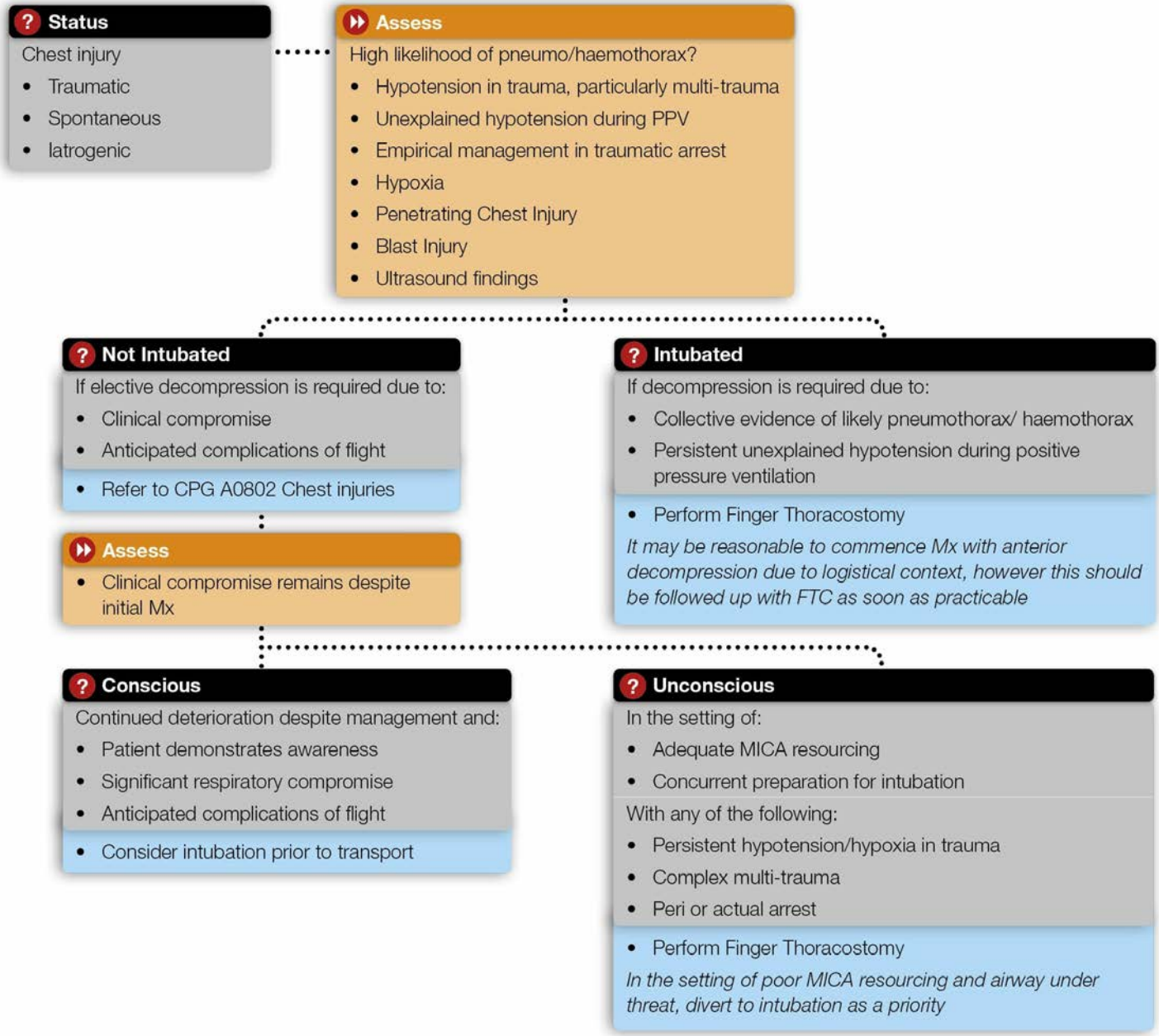
Related Resources

- https://av-digital-cpg.web.app/assets/pdf/MAC/MAC IV Paracetamol review AAV.pdf
- https://av-digital-cpg.web.app/assets/pdf/MAC/Parecoxib update for MAC FINAL (2).pdf

General Care

- Always consider pneumothorax and/or haemothorax in the setting of unexplained hypotension, especially in the setting of traumatic chest injury and positive pressure ventilation
- Early targeted pain relief in the conscious chest injury patient remains an important strategy for maximizing spontaneous minute volume and patient comfort.
- In the setting of major chest trauma in the IHT, consult with ARV.

Flowchart



Related Resources

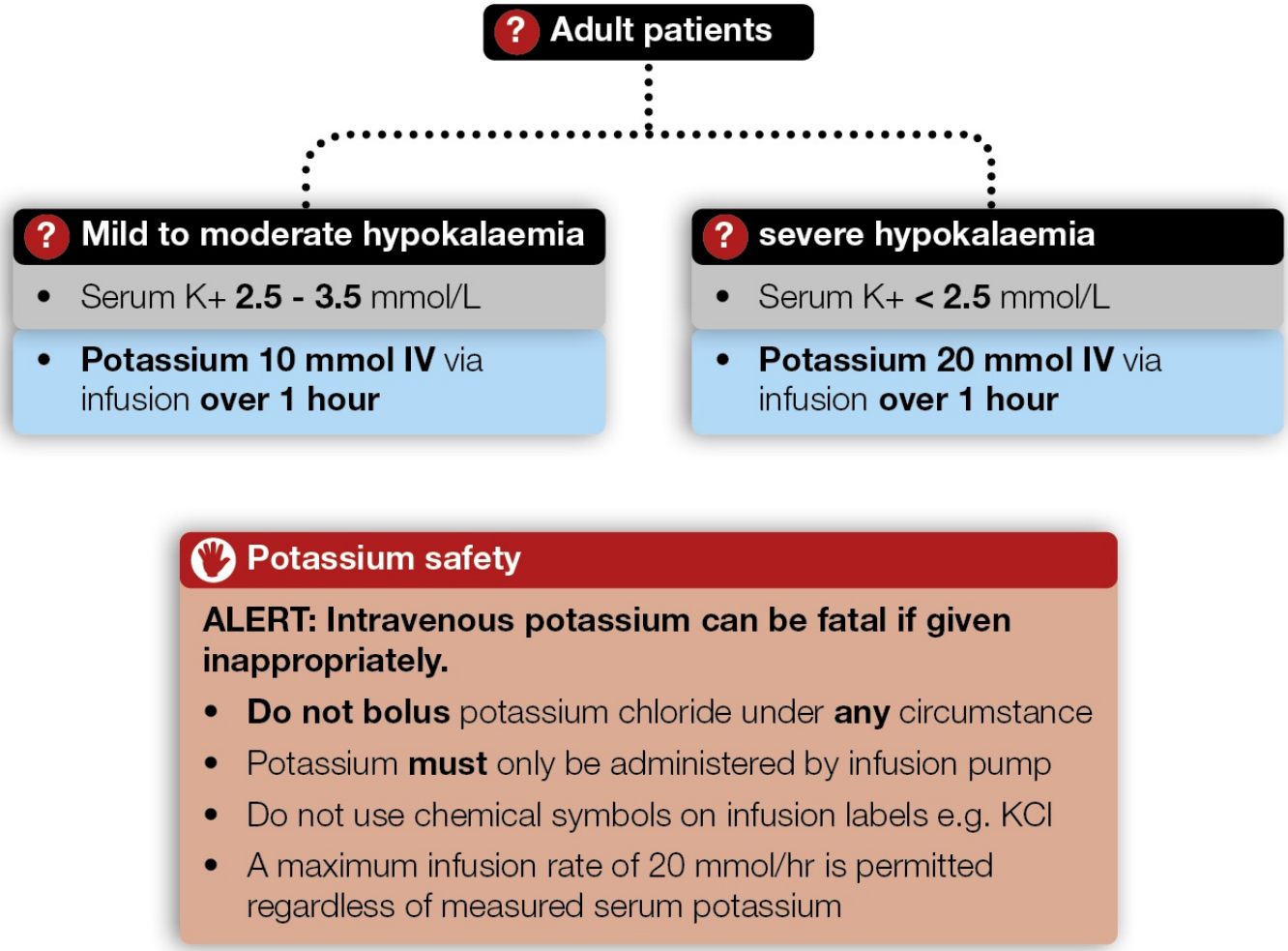
- https://av-digital-cpg.web.app/assets/pdf/CWI/CWI OPS 170 Pleural Decompression with Finger Thoracostomy.pdf
- https://av-digital-cpg.web.app/assets/pdf/MAC/4.1.4 AAV Chest Injury MAC FINAL (2) .pdf

Hypokalaemia CPG AAV 14

Care Objective

- Timely serum potassium measurement
- Safe potassium infusion preparation

Flowchart



General Notes

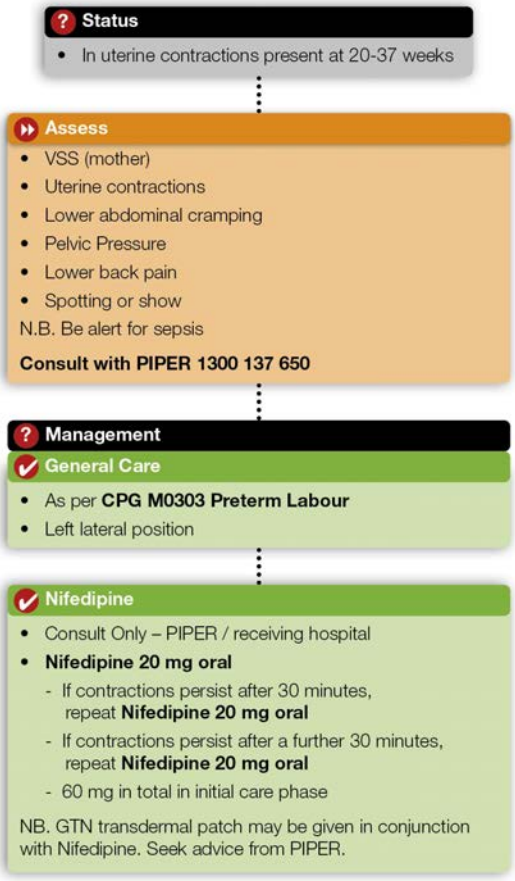
- Hypokalaemia can only be managed based on a very recent pathology measurement.
- Continuous cardiac monitoring required.
- Repeat potassium measurement following the initial hour of treatment. Repeat only if indicated and maximum dose of 20 mmol has not been exceeded.

Preterm Labour CPG AAV 15

Care Objective

- Safe transfer of a woman in preterm labour with the baby in-utero to a newborn capable healthcare service

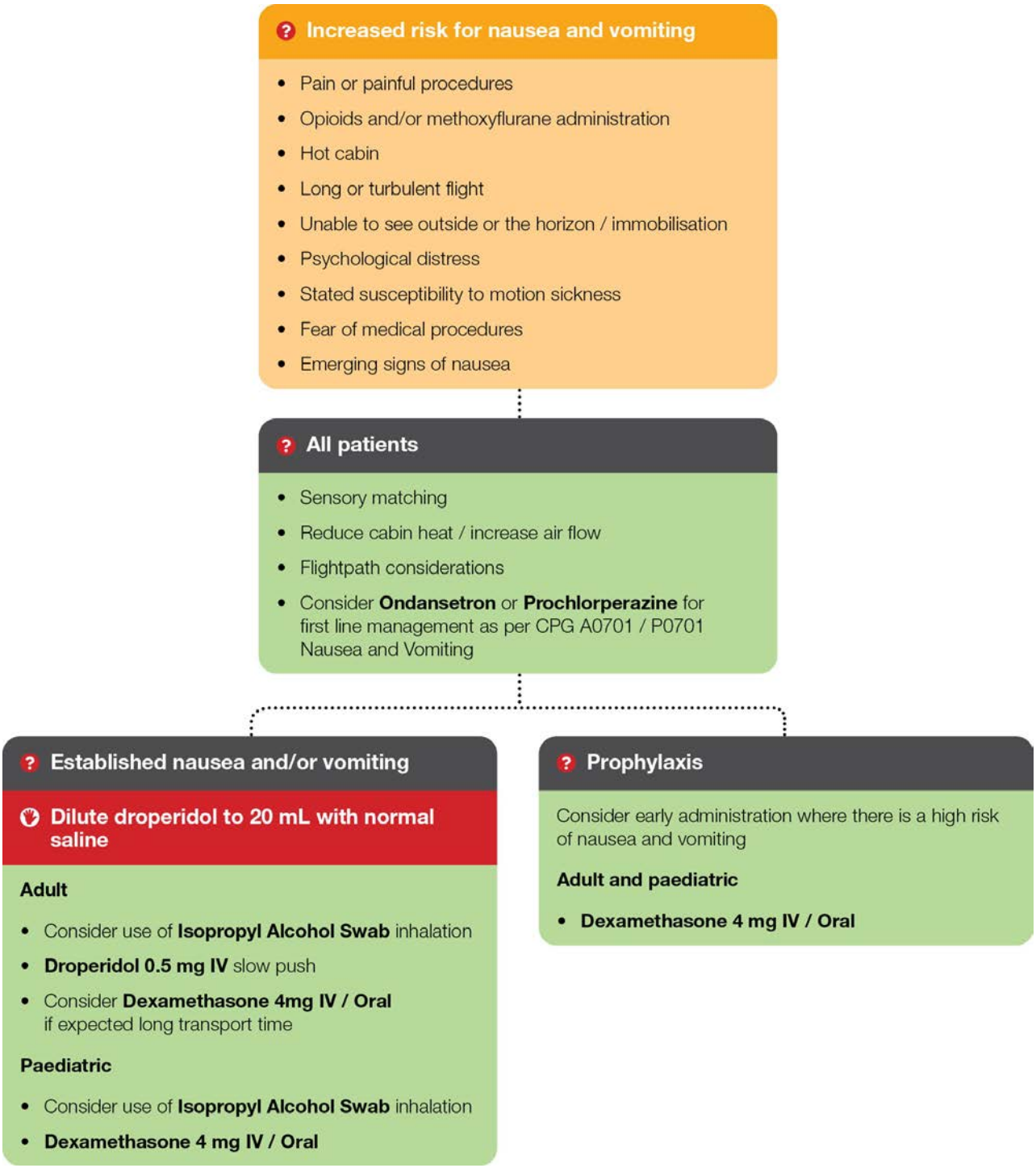
Flowchart



References

1. https://www.bettersafercare.vic.gov.au/clinical-guidance/maternity/preterm-labour

Flowchart


Increased risk for nausea and vomiting
Pain or painful procedures
Opioids and/or methoxyflurane administration
Hot cabin
Long or turbulent flight
Unable to see outside or the horizon / immobilisation
Psychological distress
Stated susceptibility to motion sickness
Fear of medical procedures
Emerging signs of nausea
All patients
Sensory matching
Reduce cabin heat / increase air flow
Flightpath considerations
Consider Ondansetron or Prochlorperazine for first line management as per CPG A0701 / P0701 Nausea and Vomiting
Established nausea and/or vomiting
Dilute droperidol to 20 mL with normal saline
Adult
Consider use of Isopropyl Alcohol Swab inhalation
Droperidol 0.5 mg IV slow push
Consider Dexamethasone 4mg IV / Oral if expected long transport time
Paediatric
Consider use of Isopropyl Alcohol Swab inhalation
Dexamethasone 4 mg IV / Oral
Prophylaxis
Consider early administration where there is a high risk of nausea and vomiting
Adult and paediatric
Dexamethasone 4 mg IV / Oral

Care Objectives

- Early identification of patients suffering from nausea and vomiting
- Prophylactic or symptomatic management to prevent complications with care

Intended patient group

- Patients with nausea and/or vomiting that will be exposed to retrieval by flight.

Overview

- Five principle neurotransmitter receptors mediate vomiting: muscarinic, dopamine, histamine, serotonin, and neurokinin receptors
- Where possible identification of the aetiology of nausea and vomiting may assist in identifying the most appropriate pharmacological and non-pharmacological interventions to support patient management, but is not necessary prior to commencing management
- In the aeromedical retrieval environment, it may be impossible to identify the specific cause of nausea and vomiting, given the number of contributing factors.

Assessment

History

- Many factors commonly encountered in the aeromedical environment may contribute to the development of nausea and/or vomiting:
  - Pain or painful procedures
  - Opioids and/or the use of methoxyflurane, particularly in combination or large doses
  - Hot cabin environment, particularly where airflow is difficult to maintain or a sense of claustrophobia is present
  - Long or turbulent flights
  - Inability to see outside cabin or immobilisation
  - Psychological distress, including fear of flying, situational distress etc
  - Stated susceptibility to motion sickness
  - Expressed fear of medical procedures

Emerging signs of nausea

- The following subtle signs and symptoms are indicative of emerging nausea that may lead to vomiting.
  - Restlessness
  - Headache
  - Burping / flatulence

- ‘Prickly heat’ sensation and clamminess
- Slowing heart rate
- Deep sighs
- Yawning

Management

All patients

- Manage as per **CPG A0701 – Nausea and Vomiting** or **CPG P0701 – Nausea and Vomiting**
- Sensory matching aims to connect the sensory cues between the vestibular, visual and proprioceptive signals to reduce nausea. Procedures which may help to achieve this include:
  - Allowing visualization of the horizon
  - Placing the head against the back of the stretcher
  - Reducing exposure to strobing lights
  - Distraction from the flight, such as conversation
- Where safe and appropriate for the patient’s condition, an alternative flight path may be negotiated with the pilot to avoid anticipated turbulence.

Established nausea and/or vomiting

- Consider the use of Isopropyl Alcohol Swab inhalation while initiating management, or in conjunction with management.
  Procedure

  - Hold or instruct the patient to hold an alcohol swab approximately 2 cm under their nose
  - Instruct the patient to take deep breaths through their nose
  - The patient can decide how frequently they choose to inhale the swab depending on level of nausea and efficacy of treatment
  - Anti emetic effects are usually seen within several minutes
  - Provide a new alcohol swab every 15 minutes as required to manage nausea

- If nausea and/or vomiting is persistent, consider the following management in addition to ondansetron or prochlorperazine:
  Adult patients
  - **Droperidol 0.5 mg IV slow push**
    - Administration of **Droperidol** for nausea and vomiting requires atypical dilution.
    - Dilute **10 mg Droperidol** into 20 mL of **Sodium Chloride 0.9%** to give concentration of 0.5 mg / mL.
    - **Ondansetron, Prochlorperazine and Droperidol** may all potentially cause QT prolongation. Ensure the ECG is monitored, particularly for co-administration of

medications or where other risk factors for QT prolongation are present (e.g. patient history, electrolyte imbalance).

- If extended prehospital times are expected (> 1 hour), the addition of **Dexamethasone** IV may be considered.

Paediatric patients

- **Dexamethasone 4 mg IV**
- Aim for a reduction of symptoms rather than elimination.
- ALS Flight Paramedics are not permitted to cannulate paediatric patients < 12 years of age for the administration of dexamethasone. It may be administered IV in patients < 12 years where an IV is already established.

Prophylaxis

- The need for prophylactic management should be indicated by actively appraising the listed risks for nausea and vomiting.
- For patients aged ≥ 21 years, consider **Prochlorperazine 12.5 mg IM** as per **CPG A0701 – Nausea and Vomiting**.

Dexamethasone

- Earlier administration is associated with improved effectiveness.
- May be given in addition to prochlorperazine
- Consider for:
  - Paediatric patients
  - Patients where prochlorperazine should be avoided (e.g. due to sedative effects)
  - High likelihood of in-transit nausea and vomiting

Related Resources

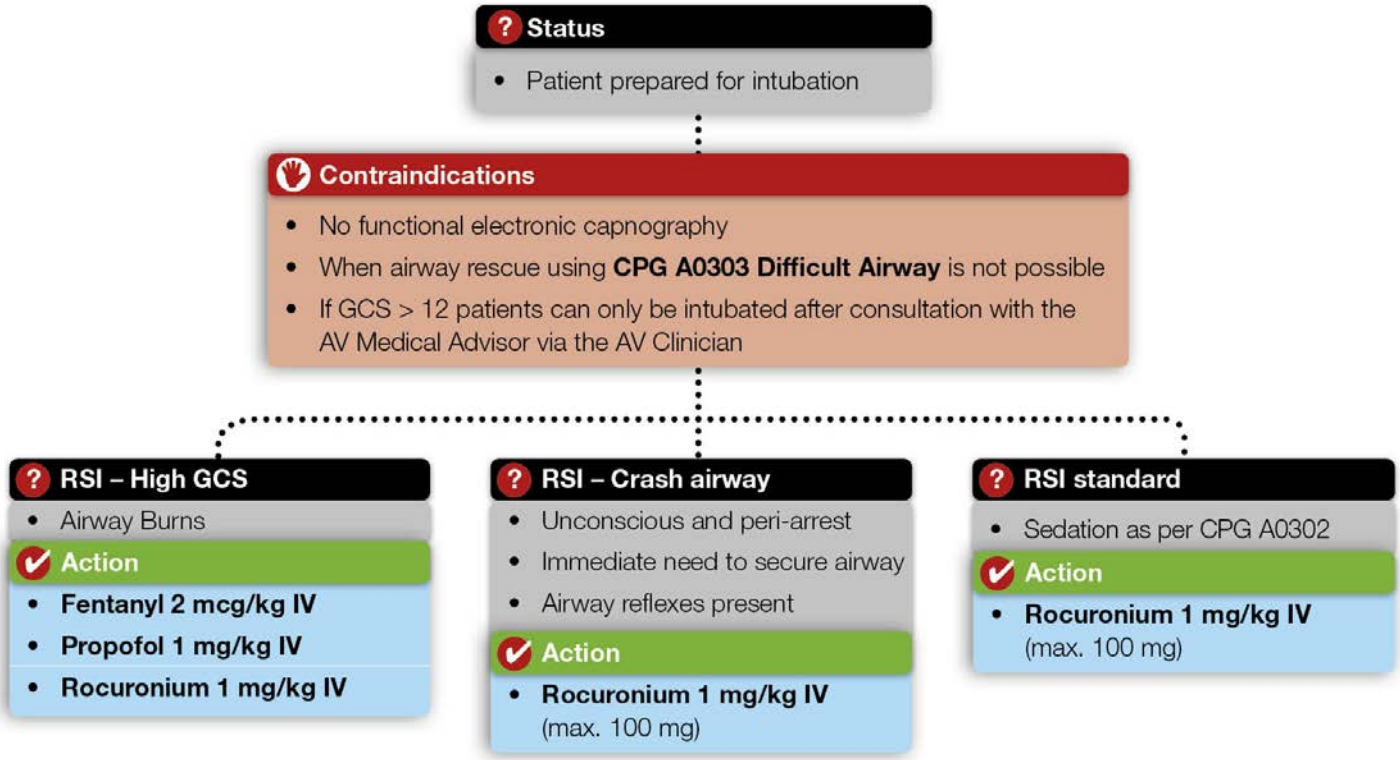
- https://av-digital-cpg.web.app/assets/pdf/MAC/MAC paper - AAV Nausea and vomiting.pdf

Rapid Sequence Intubation (Paediatric)

CPG AAV P01

This CPG has been replaced by the updated **CPG P0301 Endotracheal Intubation** as of November 2025. These CPGs will remain here for reference if required during the transition period for approx. 3 months and will then be deleted.

Flowchart



This CPG has been replaced by the updated **CPG P0301 Endotracheal Intubation** as of November 2025. These CPGs will remain here for reference if required during the transition period for approx. 3 months and will then be deleted.

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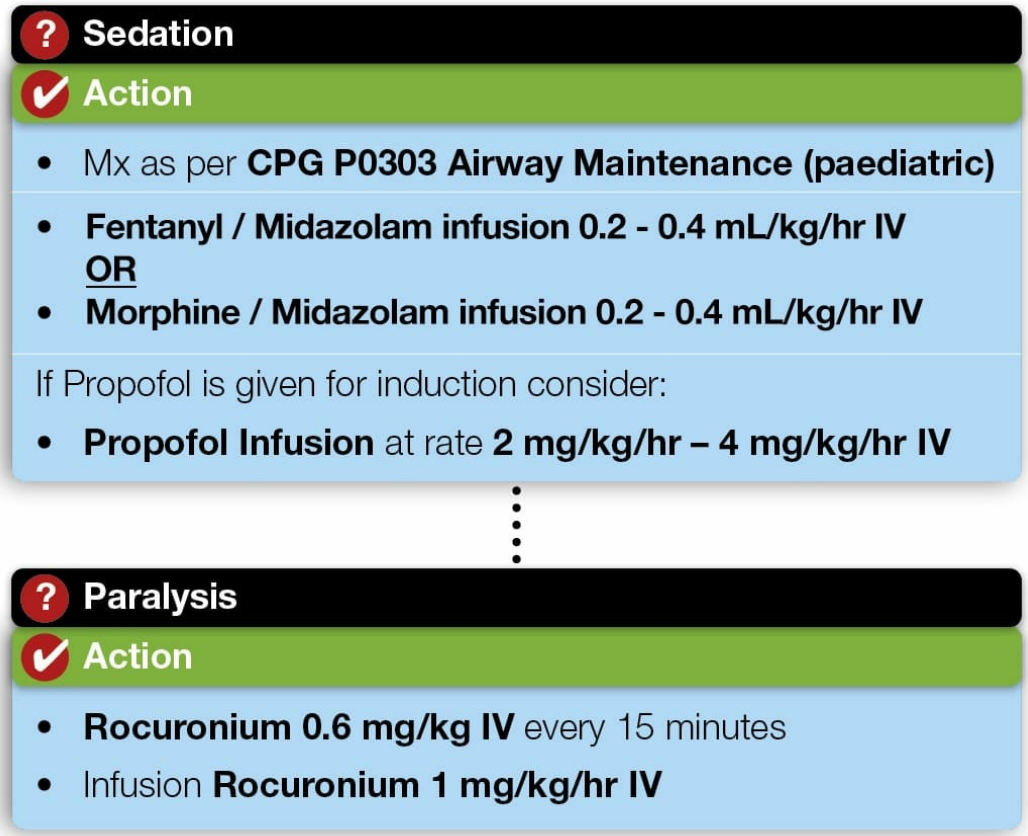

General Notes

- Multimodal pain relief is recognised as the most effective pathway for efficacious analgesia and limits excessive opiate administration. Unless contraindicated, Paracetamol IV should be administered to all trauma patients complaining of pain regardless of severity. Parecoxib, in addition, should be strongly considered for patients with moderate to severe pain unless contraindicated.
- Paracetamol and Parecoxib are slow acting, long lasting agents that provide bridging analgesia between the prehospital and emergency department settings.
- Dose errors in IV paracetamol administration for paediatrics is a documented issue. **Do not** administer paracetamol directly from the soft pack to paediatric patients. To avoid the risk of overdose, draw the required dose out of the soft pack and administer from a separate syringe.
- The use of Ketamine is not specifically contraindicated in the patient requiring winching. However MFPs must be acutely aware that that a dissociated patient can be an inherent safety risk during the winching operation. Ideally patients should be allowed time to return to full consciousness prior to extrication and MFPs should include this potential delay in winch operations planning. Alternatively, other analgesic agents such as Methoxyflurane may be considered for procedural pain relief in the winch setting
- ALS Flight Paramedics **are not permitted** to cannulate paediatric patients < 12 years of age for the administration of analgesia. Where a patient < 12 years of age already has an IV in situ, ALS flight paramedics can administer IV pain relief as required. Where the current plan for pain relief is unlikely to be effective, consult with PIPER (if they are the coordinating body) or the MFP on duty, for a management plan prior to transport.

IV Paracetamol dose / volume table

Age (years)	**Weight** (kg)	**Dose** (mg)	**Total volume** (mL)	**Rate** (mL/hr)
3 months	6	90	9	36
6 months	8	120	12	48
1 year	10	150	15	60
2	12	180	18	72
3	14	210	21	84
4	16	240	24	96
5	18	270	27	108
6	20	300	30	120
7	22	330	33	132
8	24	360	36	144
9	26	390	39	156
10	33	495	49.5	198
11	36	540	54	216
12 - 15	40	600	60	240

12 - 15	50	750	75	300
12 - 15	60	900	90	360

Infusions

Morphine Infusion

- **Morphine 30 mg** added to make **30 mL** with **Dextrose 5% or Normal Saline**
- **1 mL/hr = 1 mg/hr**

Fentanyl Infusion

- **Fentanyl 300 mcg** added to make **30 mL** with **Dextrose 5% or Normal Saline**
- **1 mL/hr = 10 mcg/hr**

Ketamine Infusion

- **Ketamine 50 mg** added to make **50 mL** with **Dextrose 5% or Normal Saline**
- **1 mL/hr = 1 mg/hr**

Ketamine 50 mg may be obtained by adding **50 mg (5 mL)** of the pre-diluted **10 mg/mL Ketamine** solution to **45 mL Dextrose 5%** or **Normal Saline** to make a **1 mg/mL** dilution

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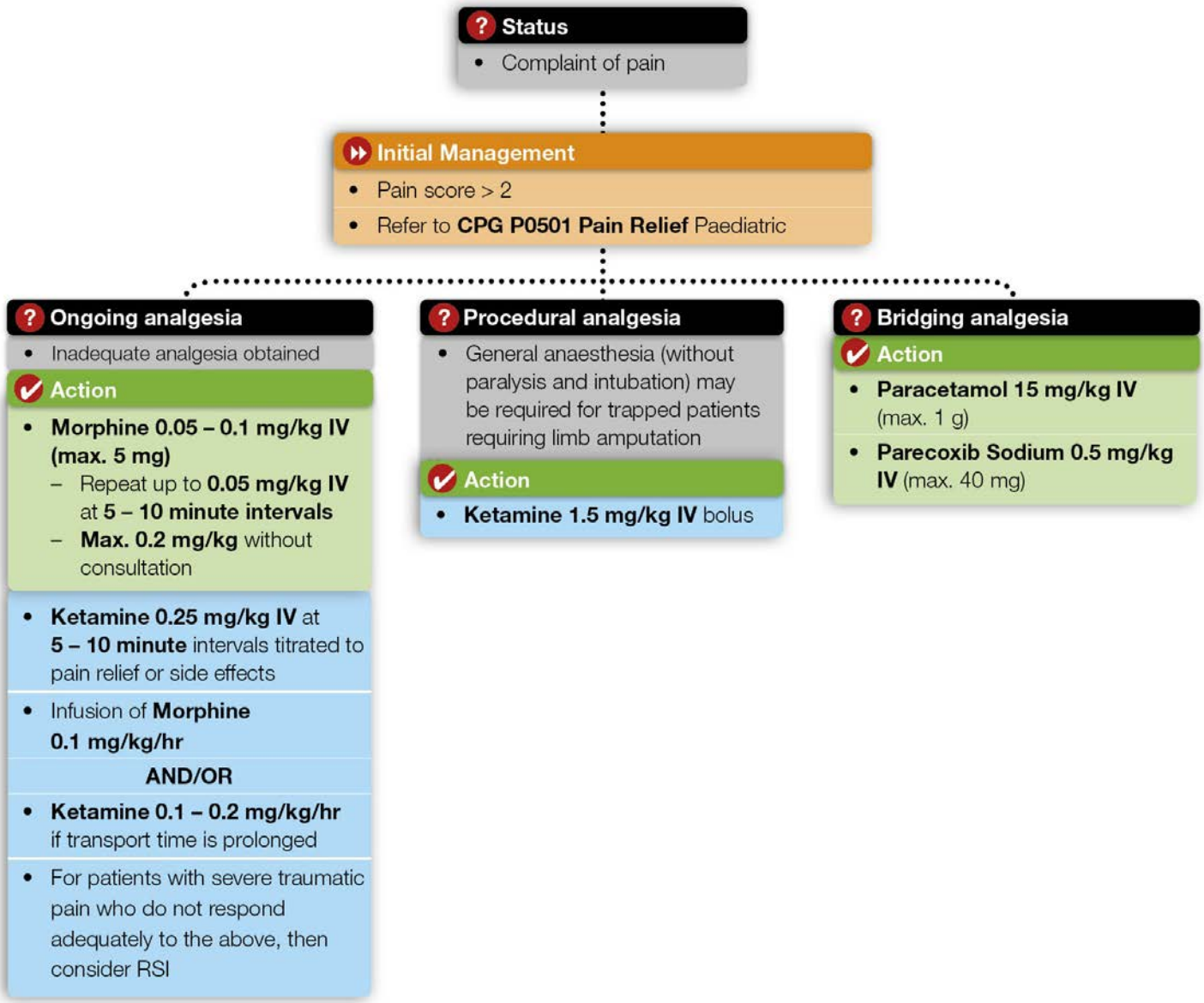

Related Resources

- https://av-digital-cpg.web.app/assets/pdf/MAC/MAC IV Paracetamol review AAV.pdf

Arterial Line Insertion CPG AAV REF01

Flowchart

Status

- Patient with potential haemodynamic instability

Assess

- The blood pressure of a patient with potential haemodynamic instability is most reliably monitored during air transport with an electronic transducer connected to an intra-arterial cannula
- Provided there is a palpable radial pulse and time permits, an arterial line maybe inserted by a MICA Flight Paramedic in any of the following conditions
  - Secondary transfer of haemodynamically unstable patients
  - Primary attendance at haemodynamically unstable patients where the transport time is likely protracted or where NIBP is unreliable

Action

- Up to two attempts at insertion are allowed at one radial artery site only
- A 20G or 22G IV cannula or a proprietary kit with guide-wire may be used
- An injection of **1-2mL of Lignocaine 1% S/C** may be required at the cannulation site in an awake patient

Helicopter Safety & Landing Site Requirements

CPG AAV REF04

Operating around helicopters can be dangerous. This card provides important information for the safety of bystanders and emergency services when working in the vicinity of helicopters.

Helicopter Safety Considerations

Emergency Personnel, Vehicles & Bystanders must **remain well clear of the landing area** during landing and take-off. **Protect eyes** with safety goggles or turn head when helicopter is landing and departing.

DO NOT APPROACH THE HELICOPTER unless escorted by a crew member.

If escorted - Only approach or depart the helicopter in the green shaded area indicated.

NEVER WALK BEHIND A HELICOPTER

If on uneven ground, **approach** or **depart** from the **downhill** side.

NEVER from the uphill side or the rear.

Landing Site Requirements – Minimum 40 metres x 40 metres

The **Pilot in Command** of the helicopter has the **final decision** on suitability of the landing site. This also includes the destination hospital.

- Area a minimum of 40 x 40m or about the size of 2 tennis courts.
- Surface should be Free of Obstacles and as Firm and Flat as possible.
- **Landing site to be free of Overhead Wires**
- Approach / Departure paths to be into wind where possible.
- Vehicle Doors & Windows to be closed.
- All loose articles including stretchers to be removed or secured.
- At night, be prepared to turn lights off if requested by crew

Helicopter Winch Safety Considerations

The downwash of a helicopter can be considerable, with potential to cause flying dust, debris or blow equipment away, break tree branches or even bring whole trees down.

The following should be considered when a helicopter winch is likely:

- **Look up**, check for overhanging, broken or dead tree branches and **maintain awareness** of potential for falling debris throughout winch operation.
- **Consider moving** the patient/ persons to be winched away from the hazards where possible.
- **PPE** including Hearing, Eye and Head Protection for all personnel/ patients where available.
- **Secure** all loose items and equipment that may be blown away by downwash.
- Only **essential** personnel should remain in the immediate winch area.
- **Bystanders** should be moved well **clear** of the winch area including the helicopters likely approach and departure paths (into wind wherever possible).
- **Follow** any **directions** provided by the helicopter crew.
- **Maintain awareness** of above considerations until helicopter has **departed** the area.

Anti-Rotation “Tag” line Operation

When a stretcher is to be winched, an Anti-Rotation or ‘Tag’ Line will be attached to one end of the stretcher and held by a nominated Tag Line Operator on the ground. This is to prevent the stretcher from spinning while being winched up to the aircraft.

If you are asked to operate the Tag line:

- **Listen carefully to the briefing** provided to you on its operation, even if you have done it before.
- **PPE** including Hearing, Eye and Head protection along with sturdy gloves **must** be worn.
- **Maintain awareness** of surroundings at all times.
- **NEVER wrap** the Tag Line around your Hands/ Arms/ Body.
- **NEVER attach** the Tag Line to anything.
- When the stretcher reaches the helicopter, the Tag Line will be released by the rescue crewman and will fall to the ground. **Remain clear** of the falling line.

- Return the Tag Line as instructed.

Before giving the 'Ready' signal, check the following using SPECTER Checks:

- S - Stretcher: Straps, Security
- P - Patient: Protection (eyes, ears), Patient brief
- E - Equipment: ready, checked, secured
- C - Karabiners / connectors: check screwed and squeezed
- T - Tag Line: secured and ready / Operator briefed
- E - Environment: suitable for task, bystanders cleared away
- R - Risk assessment, Radio call

The 406 Stretcher is now ready to be recovered to the aircraft