Analgesia sedation in the emergency setting

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Controversies

• Where
• Which drugs
• By whom
• To whom
• For what
• With whom
• With what
  - Monitoring
  - Precautions
  - Back-up
• How

RSI ??
Anaesthetists
EM doctors
Where

- Emergency room in hospital
- MRI
- CT scanning
- Radiology
- Doctors rooms
- Theatre

Guidelines: SASA  www.sasaweb.com
EM 2010: SAMJ
By whom, and with whom

- Emergency medicine doctor
- Medical officer
- COSMO
- Anaesthetist
- GP
- Nurse
- Secretary

- Sedationist vs operator

- Experience
- Expertise
- Training
- CME
- Insight
- Paediatrics
To whom

• Child
  - Neonate
  - Infant
  - Toddler, child < 5 years
  - Child > 5 years
• Adolescent

• Patient profile
• Patient selection for PSA
Who not to do / Beware

- Difficult airways
- Syndromic children (CHD, difficult airways)
- Mucopolysaccharidoses
- Neuromuscular disorders
  - Dystrophinopathies e.g. Duchenne’s
- Hypovolaemic, ill children

Call an anaesthetist for help
Short-cut to airway evaluation

• Hello, how are you?
• Frontal view
• Lateral profile
• Ears: NB hearing aid
• Red Flags:
  - Front view: abnormal shaped ears, abnormal position, tags, asymmetry of face
  - Lateral profile: “Flat face”: mid-facial hypoplasia, ears
  - Mouth-opening: limited vs normal
  - Lumps and bumps
  - Cannot cough

Be very specific about drug choice
Rings and things

Franceschetti syndrome

Goldenhar syndrome

Conjoined twins
Can I hold a mask?
Can I ventilate?
Can I intubate?
Should I extubate?
Special considerations

- Non-accidental injuries: double insult
- Burns
- Loss of sibling(s)/ parents
- Possible medico-legal consequences / evidence
- Documentation
For what

- Investigations
- Procedures
- Medical / surgical
Major issues

- Fear
- Anxiety
- Pain
- Amnesia
- Sedation
- Minimal movement

GA may be preferred option
Which drugs: it depends

PSA encompasses a continuum of an altered state of consciousness varying from mild anxiolysis to deep sedation.

• **Simple / basic sedation:**
  - a single agent (not a combination of single agents),
  - typically an oral/transmucosal/rectal drug (e.g. small dose oral benzodiazepine) or
  - inhalation of nitrous oxide (N2O) in at least 50% oxygen.

• It stops at the point where additional agents become necessary and may not be advanced without fasting the patient.

• **Advanced sedation**
  - Any combination of drugs (by any route) or
  - Any sedation using the **intravenous route** (bolus or infusion techniques) or
  - Any **inhalational sedation** (e.g. sevoflurane), except for nitrous oxide (N2O), used as a sole agent in a concentration of less than 50% in oxygen.
  - Advanced techniques include both **dissociate and non-dissociative** techniques.

SASA Paediatric Analgesia Sedation Guidelines 2010
How to do this

• Discuss the procedure, medication, possible side effects, and the role of both the parents and child during the process.
• Be honest in discussion about treatment.
• Do not lie!
• Do not minimize the problem.
• Tell it as it is, and use age-appropriate words and explanations.
• Provide correct medication for what is needed.
• Use distraction techniques whenever possible.
• The safety of the child is a priority!!
What do you want to achieve?

- Pain relief
- Anxiolysis
- Sedation
- Amnesia
- Immobility: e.g. MRI
What determines choice?

- Child characteristics
- Injury / illness: major vs minor (iv vs oral)
- What is required
- Availability of medications
  - Usually need combination
- NB Topical agents (e.g. Burnsheild)
- Immobilization (fractures)
- Experience, training, expertise
- Airway and resuscitation skills

- Time!!!
Preparation: self, team, child, parents

• Value under-recognised
• Good explanation
  – What to expect
  – Smell, feel, hot / cold
  – Role during procedure
• Planning
• Distraction
• Allow some control of events

Get all your ducks in a row
Pre-procedure information

- Allergies, previous anaesthetics, airway assessment
- Medications the child is taking
- Past history: medical and surgical
- Last meal and fluids: when and what, in relation to injury
- Events of injury or accident
Pre-sedation check list (WHO)

- Airway assessment
- Medical history: allergies
- Consent
- Pre-procedural equipment check
- Fasting
- Baseline vital signs
- Emergency / rescue drugs, equipment

- Adverse events: drugs, skills, environment, premature discharge

- Know which patients NOT to do
Non-pharmacological therapies

- Ask permission
- Hugs and comfort / restraint
- Appropriate parental communication and information about what is expected
- Reassurance
- Sucrose and dummy (pacifier)
- Breast feeding
- Distraction
- Virtual reality
- Play, art and music therapies
Pharmacological treatment

Local Anaesthesia

- Topical
- Infiltration
- Nerve block
- Regional block
- Neuraxial block

TIME for it to work
Pharmacological treatment

**Simple analgesics**

Mostly oral administration

Time for onset of action

- **Paracetamol**
  - IVI (Perfalgan), orally (as syrup or suspension) and rectally (as suppositories)
- **NSAIDs**
  - not recommended in major trauma, or any child requiring fluid resuscitation, until good urine output is established.
- **Codeine**
  - only available for oral use in SA
- **Sucrose, breast milk**
Introducing........

- Clonidine: 1-5 mcg/kg/dose po

- Oral ketamine: 2-10 mg/kg/dose po

For >5 mg/kg/dose of ketamine, add atropine 5 - 10 mcg/kg/dose (max 0.5 mg). Both orally
Opioids and tramadol

- Morphine
- Valoron: 1mg/kg/dose
- Pethidine
- Tramadol
Other drug options

“The use of anaesthetic drugs by non-anaesthetists

- Propofol
- Ketamine
- “Ketofol”
- Fentanyl
- Alfentanil x
- Remifentanil x

Inhaled Nitrous oxide
Entonox

“True genius lies in simplicity”
Sedatives

- Vallergan
- Droperidol
- ChloraLyte
- Trichlorphos
- Clonidine
- SOP XX

- Midazolam
- Dexmedetomidine
RSI in the ER

- Time from last food / fluid to injury
- Time from injury
- When will the child be NPO?
- Probability of deep sedation or anaesthesia
- Do NOT paralyse if you cannot maintain the airway

- RSI or “modified RSI

Unless you have anaesthetic or EM training, call an anaesthetist
My choices

• EMLA asap / LA infiltration
• Valoron
• Drip: Perfalgan
• Low-dose ketamine (0.25 - 0.5 mg/kg ivi)
• ± midazolam (anxiolysis)
• Morphine (if not Valoron yet)

Oral only:
• Paracetamol + clonidine ± NSAIDs
• Valoron (sublingual)
Monitoring

**Depends on**
- the child
- haemodynamic stability
- injuries sustained
- planned procedure
- experience of staff
- choice of drugs
- availability of medications

**Options**
- Oxygen saturations
- BP
- ECG
- ETCO2
- Capillary filling
- LOC
- Urine output
- Close observation

“The price of success for PAS is eternal vigilance”
Discharge criteria

- Awake and responding appropriately for age
- Minimal discomfort and appropriate analgesia to take home
- No airway complications (stridor, wheezing)
- Able to take oral fluids
- No nausea or vomiting
- No excessive bleeding
- Have a reliable care-giver
- Have instructions to return if problems arise.
Duchenne Muscular Dystrophy

- Common: 1:3,500 live male births
- May die under anaesthesia and sedation
- Sensitivity to non-depolarising muscle relaxants: **Scoline is contraindicated!!**
- Sensitivity to all inhalational agents
- Problems:
  - Rhabdomyolysis
  - Hyperkalaemia
  - Cardiomyopathy
  - Malignant hyperthermia: no more risk than general population
  - Respiratory compromise
Top Ten Tips

- Assess child: airway, injury, and pain history
- Use LA: allow LA time to work
- Ketamine
- Titrate drugs to effect
- Beware continuum of sedation to GA: recognise who should not be sedated by inexperienced practitioners
- Know drugs and side effects
- Have reversal agents available
- Sedationist ≠ operator
- Treat each case individually
- GA may be preferred option
Conclusion

“Sedation analgesia is the God-given art and science of rendering a person insensitive to a noxious or unpleasant stimulus whilst keeping them alive, and allowing the procedure to take place safely”

Patient comfort and safety is a priority

THE END
HAPPY VALENTINE'S DAY
The ideal management

• Psychological preparation
• Recognition of unsuitable candidates for PSA
• Local anaesthetic
• Technique for procedure: HAT, medical “super glue” vs injection
• Intravenous agents for moderate to severe trauma (not IMI)
• Sublingual / nasal
“Ketofol” recipe for PSA

• 50 mg ketamine with 90 mg propofol diluted to 10 ml. This results in concentrations of 5 mg/ml ketamine and 9 mg/ml propofol, and, of this solution, 0.05 ml/kg is recommended.

• 0.25 mg/kg ketamine and 0.45 mg/kg propofol.

• Need specific skills
Alfentanil

• 0.5 – 1 mcg/kg/dose

• For > 2-minute procedure, use infusion

• 10-12 mcg/kg/hour
“The safe sedation of children requires a protective net composed of skilled personnel, vigilance, monitoring equipment, common sense in selecting patients suitable for sedation, appropriate selection of drugs and drug dosage, age and size appropriate airway management equipment, and drugs to sustain life. Seizures, respiratory arrests, and deaths in a variety of practice settings have occurred when any one of these was deficient.”