Pain Assessment of the Critically ill Child: State of the Art

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Objectives

- Define current pain assessment
- Overview the many challenges
- Propose strategies to optimise pain assessment
How are we doing?

Over 35 neonatal pain measures and more for children

- More than 10 published reviews
  von Bayer et al. Pain 2007;127:140-50;
  Stinson et al. Pain 2006; 125:143-57;
  Ramelet ACC 2004; 17:33-45;

- Many protocols have been developed
  [http://www.painedu.org/resources.asp](http://www.painedu.org/resources.asp)

- Position statements and recommendations
  [http://www.ampainsoc.org/advocacy/pediatric2.htm](http://www.ampainsoc.org/advocacy/pediatric2.htm)
  Summary Proceedings From the Neonatal Pain Control Group Pediatrics 2006;117:S9- S22
Yet Pain is still poorly assessed

- 19% of NICUs used validated pain measures in Italy

- 6% in Australia
  Harrisson et al. JPaed Child Health 2006;42:6-9

- When assessed regularly, inter-rater reliability of assessments between experienced nurses was poor (0.21-0.64)
  Katz et al. Europaediatrics Oct 2006; Barcelona
And current pain management remains suboptimal

- To describe the frequency of use of analgesics in invasive procedures
- 151 neonates
- Mean of 14 (± 4) procedures per day
- Pre-emptive procedural analgesia given to 35% of neonates
- 40% received no procedural analgesia
Morphine for procedural pain in ventilated preterm neonates


- NEOPAIN trial
- 42 neonates
- Loading does of 100mcg/Kg + infusion 10-30 mcg/Kg/h vs placebo
- Intervention: 3 heel sticks- before, 3 h, and 20-28 h after loading dose
- Pain scores were not statistically different between groups
- Inadequate analgesia for invasive procedures
What are the challenges?

- Accurate assessment, interpretation, and management of pain in critically ill children

- Integration of pain assessment into practice and sustain appropriate use of pain assessment/management strategies

Van Dijk et al. Why not stick to a pain/distress protocol in the PICU? 5th World Congress on PIC 2007; Geneva
Why is pain assessment so difficult in the PICU/NICU

- Diverse population/developmental age
- Various pathologies
- Different type of pain: acute, procedural, postoperative, chronic, cancer pain
- Masking effect of sedative/hypnotic agents
- Impaired communication
- Discriminate pain from other adverse conditions
- Various pain management practices
- Skill-mix of assessors
Description of indicators of persistent pain in critically ill infants is limited (Boyle et al. Pain 2006; 124:87-91).

- There are subtle behavioural changes between intensity and type of pain (e.g. postoperative pain alone and postoperative pain + procedural pain) (Ramelet et al. Ped Crit Care Med 2006; 7:19-26; Boyle et al. Pain 2006; 124:87-91).
- Children who are pharmacologically paralyzed cannot display behavioural responses.
Pain scales for the non-communicative PICU patient

- Premature Infant Pain Profile (PIPP)
- COMFORT
- FLACC
- MAPS- Revised©
MAPS–Revised ©

- Developed from pain cues observed in postoperative critically ill infants
- 5 categories: vital signs, breathing pattern, facial expressions, body movements, state of arousal
- Possible scores: 0-10
- Tested for reliability, construct, concurrent and convergent validity, and clinical utility

Ramelet et al. Ped Anesthes 2007;17:333-44
Ramelet et al. Ped Anesthes In Press
Integrated pain assessment

- Clinical practice guidelines
- Pain scoring systems
- Sedation measures
- Target desired level of sedation (Curley et al. 5th World Congress on PIC 2007)
- Algorithm to facilitate interpretation of pain and other causes for behaviour (Hummel & vanDijk Seminars in Fetal & Neonat Med 2006;11:237-45)
- Integrate algorithm into standard practice
A model for pain interpretation
Adapted from Craig's sociocommunication model of infant pain Clin Perinatol 2002; 29:445-57

- Pre/Post test intervention study
- Sample: 230 adult patients; > 24hrs ICU stay
- 20% decrease in incidence of pain
- 18% decreased in incidence of agitation
- Decreased duration of mechanical ventilation (120 vs 55 hrs)
- 10% decrease in nosocomial infections rate
Concluding Remarks

- Pain measures should not be used in isolation
- Standardization of pain assessment in combination with evidence-based algorithm for treatment options may improve pain management
- Effectiveness of pain assessment and treatment combination on health outcomes needs to be tested
- Further research in the decision-making process for pain management in the critically ill is warranted
Greetings from Australia