Paediatric Ketamine Sedation: Balancing clinical and ethical implications

Michael Neufeld
mneufeld@aut.ac.nz
Auckland University of Technology
School of Clinical Sciences
Department of Nursing
“Nobody enjoys holding a child down who is screaming and thrashing.... and we’ve all had to do it because it needed to be done for their best interest... Ketamine removes the need to physically hold the child down.”

- Flo Registered Nurse
Am I dead?

Alley, 13 years old
What Is Ketamine?

A dissociative sedative that separates the mind from the body

- Immobilizes the patient
- Maintains protective airways/basal cardiopulmonary function

- Requires fewer healthcare resources
- Reduces the risk of airway compromise

(Roelofse, 2010)
Near death experience
Pure joy

Speaking with the dead
Reliving trauma

Connecting with God
Pure terror

Up to 30% of adults report emergence events

(Craven 2007, Green & Li, 2000, Green & Sherwin, 2005)
Decreasing use in adults

(I am afraid of ketamine and will not take it again nor will I give ketamine to a patient as [his] sole anaesthetic agent)

-Johnstone (anaesthetist), 1973

Increasing use in paediatrics

(“The emergence myth is flawed...it’s a ‘so-what’ phenomena.”

-Treston et al., 2009

-“presumably a naive child is less likely to perceive hallucinations as unpleasant”

-Green & Li, 2000)
“why wouldn’t children experience Emergence phenomena? What changes in kids to adults? They’ve got a brain that sees the world and works. It may be different – they might not be able to make sense of it, but a mind is a mind and it will be doing something.”

Daniel Paediatrician.
Utilitarian justification
The ends justify the means – most good for the greatest number

Impliedations for paediatric ketamine use:

- Requires fewer resources
- More children can be treated

Cost savings Paediatric ketamine sedation vs general anesthetic – mean average approx. $1241.67 NZD* per procedure [Matched economic cohort evaluation - UK]

“Yes, yes. I know that, Sidney… everybody knows that! … But look: Four wrongs squared, minus two wrongs to the fourth power, divided by this formula, do make a right.

- Boyle, Dixon, Fenu & Heinz, 2012

But...

➢ limitless potential for benefit and harm

* Based on Int exchange rate 10/9/16
“If the thing that you want to measure is pain, ketamine seems to do a good job at managing pain, preserving respiratory function and blood pressure etc....[but] when it comes to measuring long term effects, or other things like what it does to the experience of that child from that period? You know, like what is their experience of emergence or experience psychologically? They’re things that aren’t measured well. We don’t know these things.”

(Roger, paramedic)
Implications for paediatric ketamine use:

- “Harm” currently defined by physiological risk profile

Evidence Based Practice? – what evidence?


(dreamseeding not identified as part of study design)

- Longitudinal impact? Future learning difficulties potentially negative impact on brain development and nightmares (Dimaggio, 2009, Rappaport et al.2011)

- More recent large cohort studies report Paediatric Emergence phenomena occurs in up to 28% of children similar to adult rates. (Strayer & Nelson, 2008).
I don’t know whether we’ve removed suffering or just removed the ability for children to express their suffering?”

Flo, Nurse
Autonomy
The right to choose

Implications for paediatric ketamine use:

- Paternalism: who decides what constitutes benefit and harm?
- Challenges for informed consent

“...elegant approach to restraint.

Consigning ‘brutacaine’ [brute force] to history...

...induces a state of compliance.

In 5 minutes...a child who can co-operate..."
“Sometimes children are too young to have the words....What is a 6 year old boy who doesn’t know what he has just experienced, going to say in a world where he has to be tough .... and he has to be brave?”

Rebekka Play specialist.
Implications for paediatric ketamine use:

- If ketamine causes harm to some children, is it acceptable that all children be harmed?
- Duty to eliminate harm

Moral primacy

Moral considerations must outweigh all others

Other (practical, economic, political, etc.)
“We have to trust that what we do is right, I don’t know 100%, and maybe can never know, but I need to believe that we are doing the right thing. I need to believe that we act in best interest, and continue to improve on what we know works.”

(Roger, paramedic)
A need for further research that includes children’s voice and perspectives of ketamine sedation (including non-physiological events and longitudinal exploration of harm)

Seeking ways of reducing and mitigating negative adverse emergence events. Ie. Dreamseeding
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Contact:
Michael Neufeld - mneufeld@aut.ac.nz


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Re-thinking harm: the case of ketamine sedation in paediatric practice.

Ketamine is a dissociative sedative that was developed to replace the anaesthetic drug phencyclidine (PCP) when PCP proved to have devastatingly destructive neurotoxic effects. Ketamine has been in use for more than 40 years in adults and in widespread use in paediatric practice in New Zealand since 2003. It is commonly used in emergency medicine as sedation for invasive procedures such as orthopaedic manipulation and wound suturing, replacing the need for more resource-intensive general anaesthetics. However, while the physiological risks of ketamine are well established, non-physiological events or ‘emergence phenomena’ are not so well understood, particularly in children. In adults, these phenomena are acknowledged to be traumatic for patients, family members and staff, yet they are widely dismissed within paediatric practice. This paper examines the predominantly utilitarian justification in favour of the use of ketamine sedation in the literature and through the lenses of non-maleficence, autonomy and Kantian ethics, argues for a more balanced approach which takes account of the potential harms of using ketamine sedation with children.

Key Words
Ketamine sedation, ethics, harm, paediatric practice