

Paediatric Ketamine Sedation:

Balancing clinical and ethical implications

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“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/ basic
cardiopulmonary function

Requires fewer healthcare
resources

Reduces the risk of airway
compromise

(Roelofse, 2010)

Emergence Phenomena

Pure joy

Near death
experience

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)

Adult vs. Paediatric Use



Decreasing use in adults

(Roelofse, 2010, Orlewicz et al., 2011)

"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

(Green & Sherwin, 2005, Petrack, 2000 Loryman, Davies & Coats, 2006)

"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

Implications for paediatric ketamine use:

Requires fewer
resources



More children
can be treated

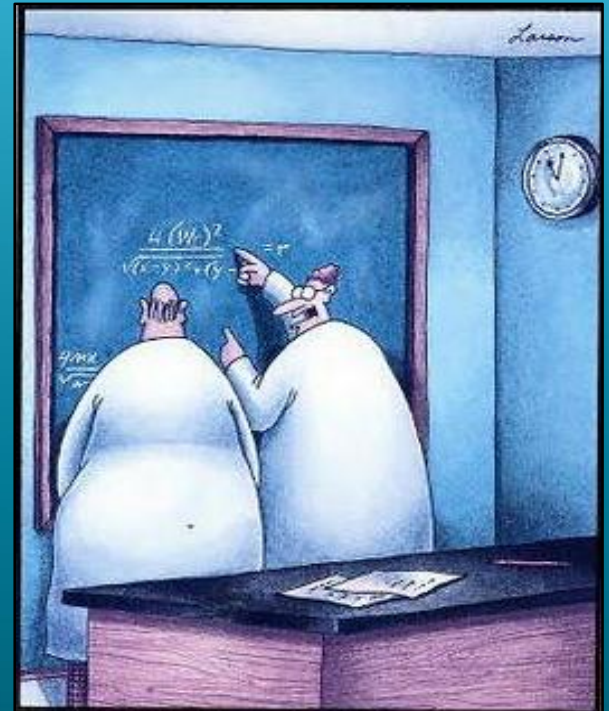
*Cost savings Paediatric ketamine sedation vs
general anesthetic – mean average approx.
\$1241.67 NZD* per procedure [Matched economic
cohort evaluation- UK]*

–Boyle, Dixon, Fenu & Heinz, 2012

But...

- limitless potential for benefit and harm

* Based on Int exchange rate 10/9/16



“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.

“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)

Non-maleficence

Do no harm



Thresholds
of concern

Normalization of the abnormal

Implications for paediatric ketamine use:

- “Harm” currently defined by physiological risk profile

Evidence Based Practice? – what evidence?

- Early studies report Paediatric Emergence phenomena in 1-2% of children (Green, 1998, Green et al, 2000, Green & Li, 2000, Sherwin & Green et al., 2000, Green & Sherwin, 2005, Green & Kraus, 2004, Kraus & Green 2005.)

(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.

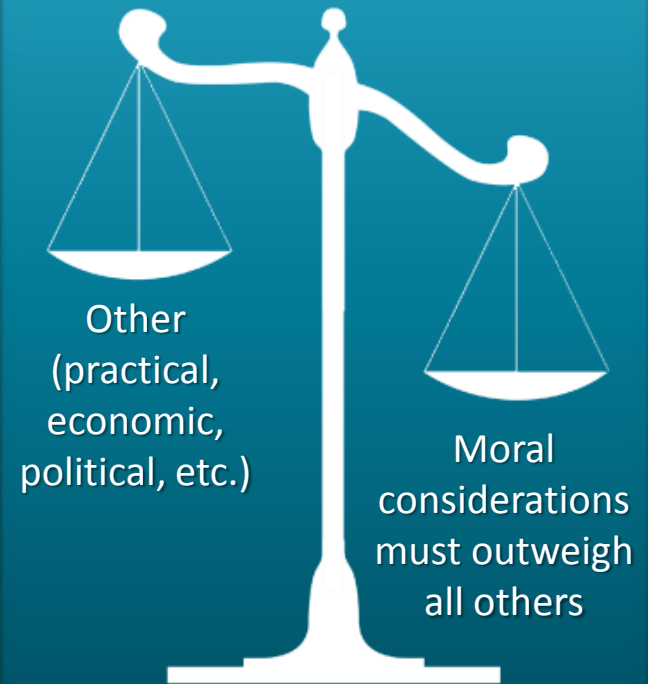
Kantian perspective- another way

Categorical imperative – in contrast to utilitarian views

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



“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)

Where to from here?

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. I.e. Dreamseeding

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abstract below

- 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