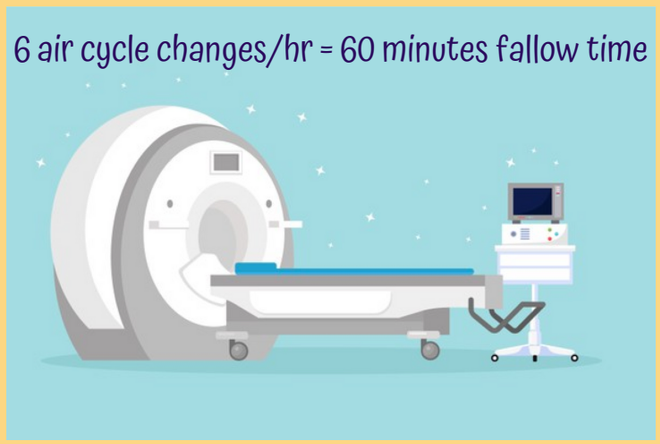
DEXMEDETOMIDINE – A SAFE AND SUCCESSFUL REPLACEMENT OF GENERAL ANAESTHESIA FOR IMAGING IN CHILDREN, THAT AVOIDS AEROSOL GENERATION

Oxford University Hospitals NHS
NHS Foundation Trust

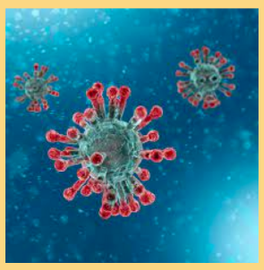
BACKGROUND

The consequences of SARS-CoV-2 on the delivery of paedatric anaesthetic services nationally have been profound, with many being suspended, accumulating backlogs and challenging the normal ways of working.



DEXMEDETOMIDINE

Dexmedetomidine is widely published as a safe and effective sole agent for imaging in children (1,2,3).

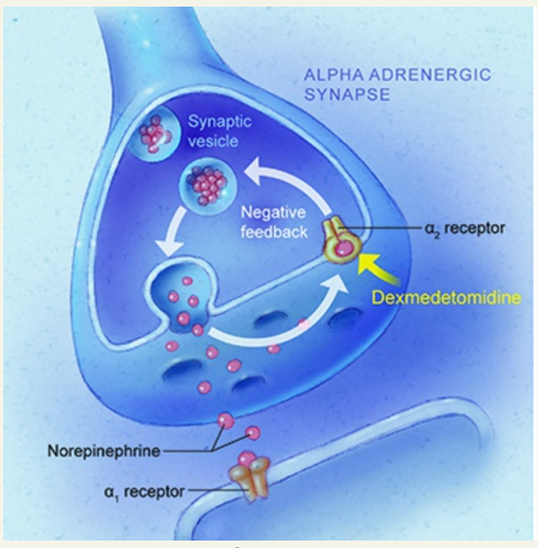


THE PROBLEM

- 3 months into the pandemic, we were faced with a GA MRI waiting list >200; 150 classed as urgent for neurosurgical and oncological surveillance.
- Due to the ventilation of our remote-site GA-MRI area, we were limited to a mere 3 GA scans per day to allow adequate fallow time between potentially infected cases (at a time when standard PCR testing was not in place).

STRATEGY FOR CHANGE

- Dexmedetomidine is a potent alpha2-agonist, that does not cause respiratory depression or obtund protective airway reflexes.
- When used as a sole agent for imaging, no aerosol generation occurs.
- In addition, this technique negates continued exposure to halogenated agents in the developing brain.



AVOID!

SOLUTION

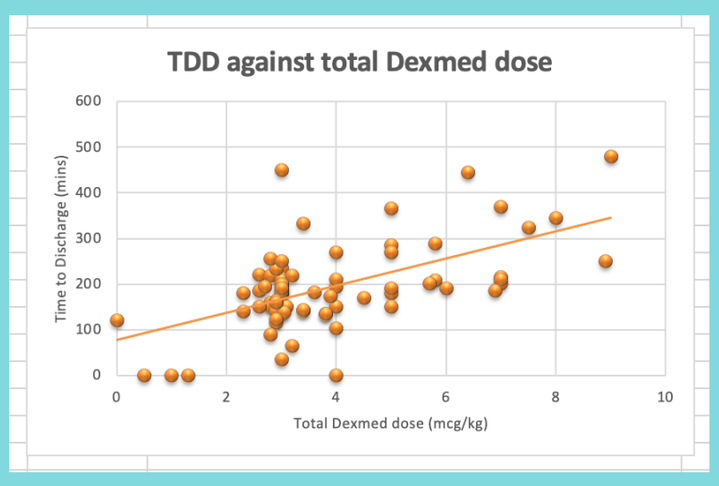
We acquired de novo clinical governance and formulary approval for Dexmedetomidine use in paediatrics as pre-med and imaging sedation within an 8 week timeframe. After consulting international centres and Great Ormond Street Hospital, we established a sedation-friendly pathway in our MRI scanner. Education and awareness were rolled out to all members of the pathway (including childrens' nurses, recovery staff and radiology). Guidelines and SOP were drafted for safety.

OUR EXPERIENCE

85 intravenous dexmedetomidine sedation scans were performed in the second half of 2020 (80 MRI, 5 CT).

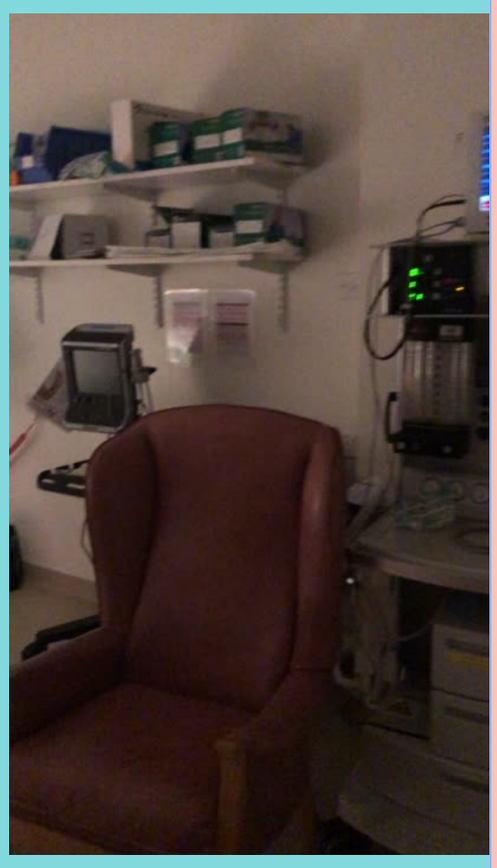
	Average	Range
Age	4 years	0.5 - 17
Total dose (loading and maintenance)	3.74mcg/kg	1.65 – 6.29
MRI Scan length	41 minutes	16 - 87
Time to discharge	190 minutes*	65 - 480

*equivocal to GA cohort once recovery area period excluded



100% SCAN COMPLETION WAS ACHIEVED WITH NO SERIOUS OR ADVERSE EVENTS

AS THE SECOND TERTIARY PAEDIATRIC CENTRE IN THE UK TO IMPLEMENT THIS PATHWAY, WE REDUCED OUR WAITING LIST FROM 7 MONTHS, TO 6-8 WEEKS



MESSAGE FOR OTHERS

Children undergoing neurosurgical and oncological surveillance require regular MR imaging. With dexmedetomidine use, the ability to negate repeated exposure to halogenated agents in the developing brain, as well as the potential serious adverse effects relating to obtunded airway reflexes and respiratory depression, shows improved patient safety (4). This is at no cost to efficiency.

Our experience shows the rapid introduction of a new protocol is safe and practical. Advantages of using Dexmedetomidine sedation for imaging include improved patient safety and reduction in waiting times. Furthermore, it is possible to achieve multidisciplinary training within the confines of a global pandemic.

We strongly encourage other centres to consider this service.

ACKNOWLEDGEMENTS

Dr. Stuart Grant and his team at Great Ormond Street Hospital
Red Cross War Memorial Childrens' Hospital, Cape Town.
Prof KP Mason, Boston Children's Hospital

Authors: W.Allan(1), S.Jones(2), B.Tingle(2)
1. Speciality Registrar in Anaesthesia, Nuffield Department Anaesthesia, John Radcliffe Hospital, Oxford.
2. Consultant Paediatric Anaesthetist, Nuffield Department Anaesthesia, John Radcliffe Hospital, Oxford. Paediatrics @ Nuffield Department of Anaesthesia.

References
1. Ansermino LR et al. (2020) Dexmedetomidine in Paediatric Anaesthesia. *British Journal of Anaesthesia Education.* 20 (10).
2. Mason KP et al. (2015)Dexmedetomidine: review, update, and future considerations of paediatric perioperative and periproceduralapplications and limitations. *British Journal of Anaesthesia.* 115 (2).
3. Mason KP et al. (2008) High dose dexmedetomidine as the sole sedative for paediatric MRI. *Pediatric Anesthesia.* (18) 5.
4. Caleb I et al. (2021) Prospectively assessed neurodevelopmental outcomes in studies of anaesthetic neurotoxicity in children: a systematic review and meta-analysis. British Journal of Anaesthesia. 126 (2). 433 – 444.