

# How often do patients desaturate during pre-hospital induction of anaesthesia?

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## BACKGROUND

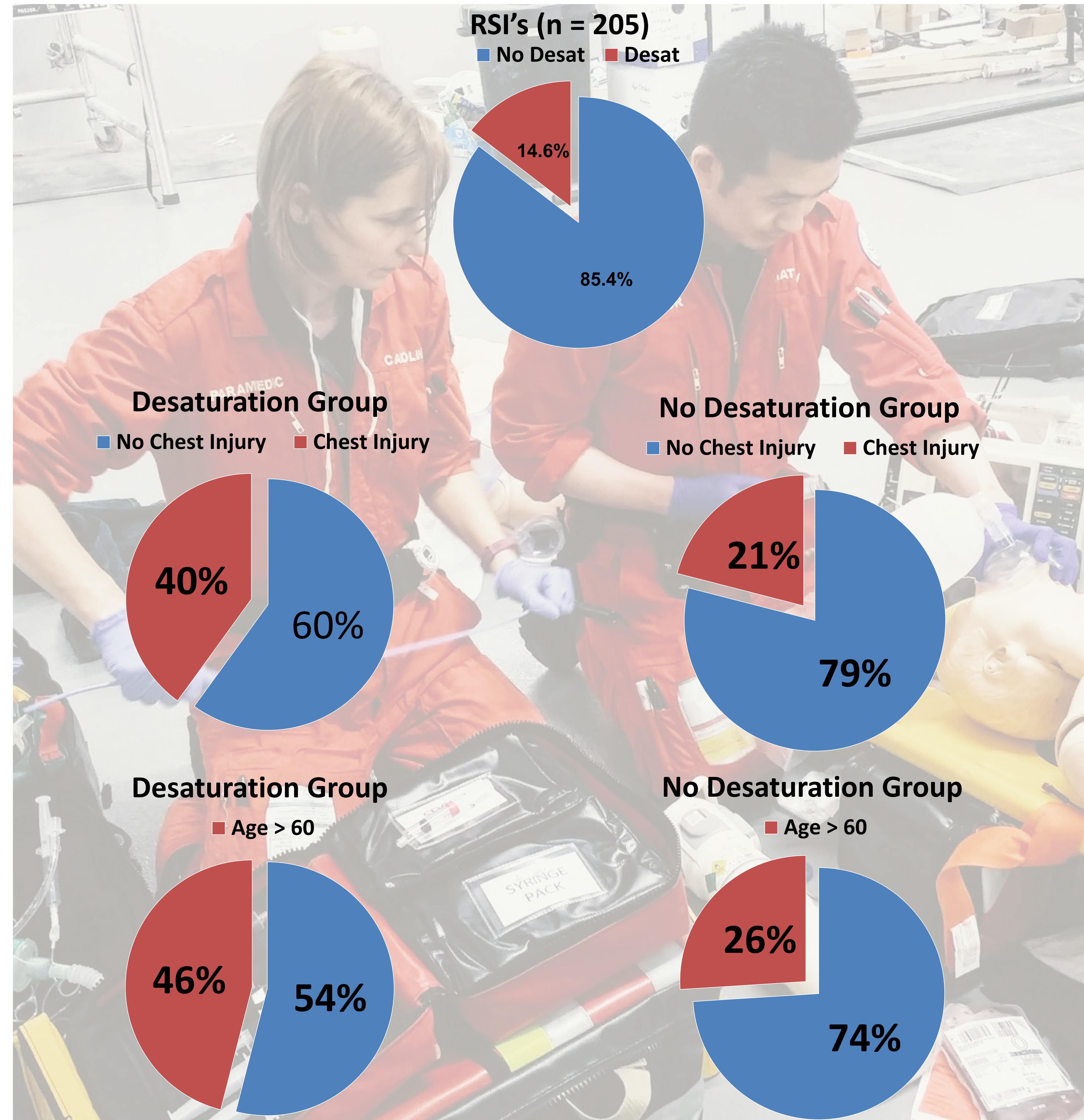
- Pre-hospital Rapid Sequence Intubation (RSI) is well established in the UK
- Our service performs between 250 to 300 RSI's a year
- Hypoxia is a known complication of RSI
- Hypoxia is a cause of increased morbidity amongst the critically ill, especially amongst head injured patients
- The incidence of pre-hospital peri-RSI desaturation has been quoted by several single centre studies to be between 10.9% and 22.6%
- Inadequate pre-oxygenation prior to RSI is likely to be a risk factor for desaturation
- A recent survey of UK HEMS services found pre-oxygenation strategies to be widely variable
- We undertook a retrospective review of our data in order to establish the incidence of peri-RSI desaturation and identify any high risk groups

## METHOD

- Retrospective review of RSI's performed between December 2016 to 2017
- Data was collected from our HEMSBase (Medic One Systems) electronic patient record
- An episode of desaturation was classified as:
  1. SpO<sub>2</sub> fall below 92% up to 5 mins post Rocuronium
  2. SpO<sub>2</sub> fall >10% if maximum preoxygenation SpO<sub>2</sub> <92%
- Data excluded if:
  1. SpO<sub>2</sub> plethysmograph trace poor
  2. Record unclear Re: time of induction and administration of Rocuronium

## RSI IN OUR SERVICE

- Delivered by HEMS Doctor/Paramedic team
- Specific indications within standard operating procedures
- 15L/min pre-oxygenation via non-rebreathe reservoir mask
- Nasal cannulae for apnoeic oxygenation in certain groups
- Standardised drug and dosing regimens
- Continual review in clinical governance process



## CONCLUSIONS

- Hypoxia is a complication of pre-hospital anaesthesia that we should try to mitigate wherever possible
- There is a remit to investigate methods that increase the inspired FiO<sub>2</sub> delivered during preoxygenation as a potential strategy to address this

## RESULTS

- 205 out of 269 RSI's were amenable to analysis
- 185 Adult and 20 Paediatric RSI's
- 133 Traumatic, 52 Medical
- 15% of patients desaturated during RSI
- 7% of non-chest injured patients desaturated during RSI
- 3% had recorded weight of 100Kg + (not a risk factor in this data)
- Chest injury and advanced age appear to be risk factors
- 50% of desaturation cohort had documented airway soiling at laryngoscopy vs 21% on the cohort with no desaturation
- 1<sup>st</sup> Pass intubation rate >92% in both groups

**Table 1. Data Collected**

Age	SpO <sub>2</sub> at time of Rocuronium administration
Injury Mechanism	Lowest recorded SpO <sub>2</sub> in 5 mins post Rocuronium
Indication for RSI	Number of attempts
Documented estimated weight	Presence of airway soiling

## DISCUSSION

- The incidence of peri-RSI desaturation in our service compares with published data
- Certain patient groups have a higher risk of desaturation during prehospital RSI (eg Elderly and those with chest injuries)
- Patients who received RSI in the absence of a chest injury had a very low incidence of desaturation
- The '1<sup>st</sup> pass' intubation rate in this service is high and was similar between the two groups
- Increasing the inspired Oxygen fraction during preoxygenation may reduce the incidence of peri-RSI desaturation, particularly in 'at risk' patient groups

## REFERENCES

1. A Nakstad et al. *Incidence of desaturation during prehospital rapid sequence intubation in a physician-based helicopter emergency service* *American Journal of Emergency Medicine* (2011) 29, 639–644
2. A. Newton et al. *Incidence of adverse events during prehospital rapid sequence intubation: A review of one year on the london helicopter emergency medical service* *J Trauma*. 2008;64:487–492.