Theatre efficiency 2020: evaluation and improvement of time efficiency in operating theatres

RESEARCH WEEK
5-9 OCTOBER 2020
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Background and Methodology

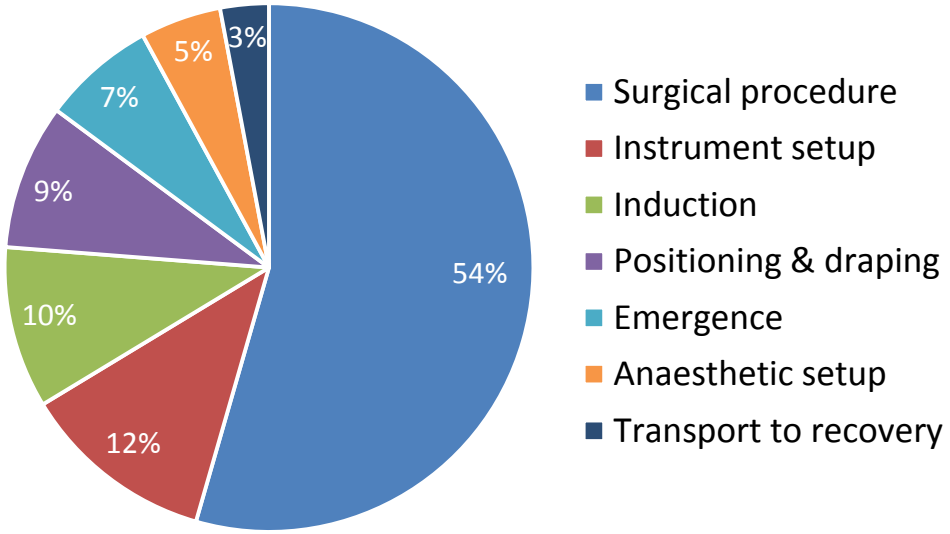
Operating theatre efficiency measurement

Time efficiency is critical to the productivity of theatres, but the methods used to evaluate it are inconsistent and incomplete. Much of the literature uses data recorded by staff during patient care to calculate poorly standardised metrics of efficiency, which makes the comparison of practices difficult and undermines efforts to improve performance.

Project methodology

- An observational prospective study of theatres in the Northern Hospital over seven weeks in February and March 2020.
- Metrics chosen were:
  - Utilisation rate (the proportion of allocated theatre time used for the procedure).
  - Overrun duration (theatre use in excess of scheduled).
  - Changeover (time from exit of one patient to entry of next).
  - Delay (interruption in procedure progress for ≥ 5 minutes).
- Mann-Whitney and Kruskal-Wallis tests with $p \leq 0.05$ for significance were used.

Use of theatre time over all observed cases



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Results

Quantified theatre efficiency at TNH

- In 36 surgical lists the mean utilisation was 74.4% ± 12.0% and mean overrun was 3.6 ± 73.5 minutes.
  - 50% (18) of lists ended <30 minutes of scheduled, while 17% (6) each were >1 hour early or late.
- Over 139 procedures the mean overrun was 22.1 ± 36.2 minutes and mean changeover was 20.5 ± 7.0 minutes.
  - Mode of anaesthesia affected utilisation (p<0.001), while surgical specialty did not (p=0.153).

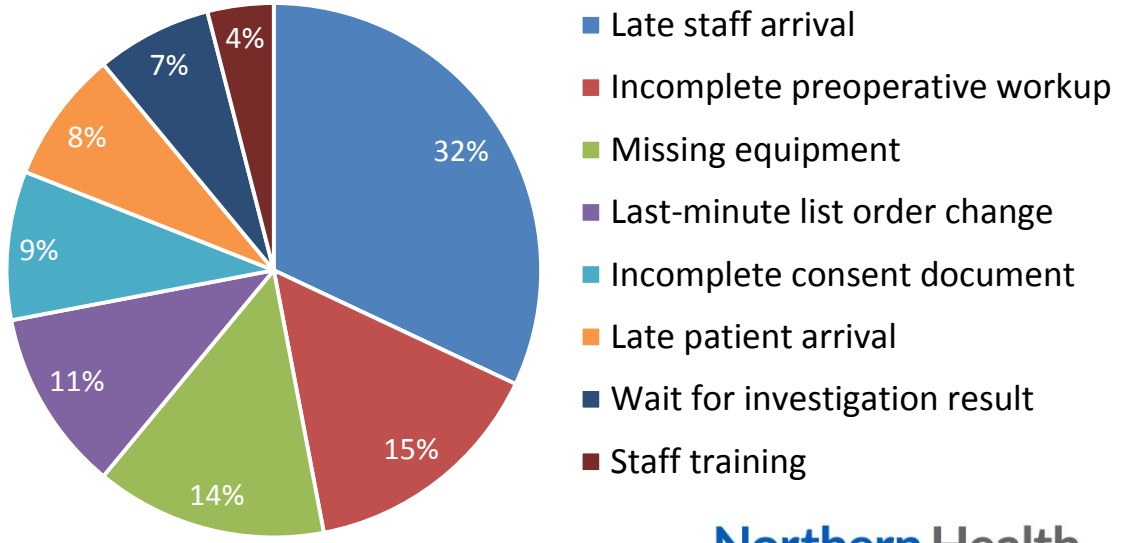
Day-of-surgery cancellations

- 10.3% (14) procedures were cancelled on the day of surgery.
  - 29% (4) were due to insufficient remaining list time.
  - 14% (2) each due to incomplete workup, inter-department miscommunication or inadequate fasting.

Preoperative delays

- 56% (20) lists started late, mostly due to preventable causes.
- No difference in utilisation (p=0.967) or overrun (p=0.360) was found between punctual and late-starting lists.

Causes of late first case start



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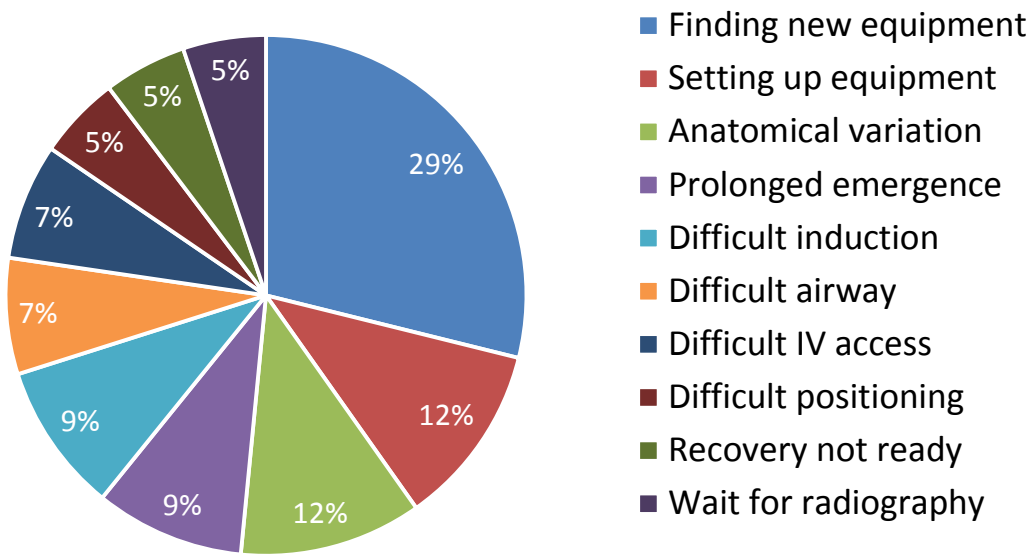
Results and Conclusions

Intraoperative delays

- Delays were recorded in 60% (83) of procedures, of which:
  - 41% were related to finding and setting up instruments or equipment.
  - 32% were due to anaesthetic factors.
  - 17% were due to surgical factors.
  - 10% were due to logistical factors.
- No specialty or procedure type was more likely to experience delay.

Causes of intra-operative delay



Conclusions

- Mean list utilisation of 74.1% is below the Victorian average of 80%, but the latter was audited retrospectively.
- Mean changeover of 20.5 minutes compares favourably with reported averages from Australia and internationally.
- Session overrun and subsequent day-of-surgery cancellations were an obstacle to efficiency.
- There is room to improve in first case start punctuality and frequency of replacing instruments and equipment.

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