Evaluating the non-technical skills of inter-hospital air transport clinicians: A clinical simulation study

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Conceptualising key areas of clinical performance: what skills to measure?

Technical skills:

- Procedural and clinical knowledge and abilities

Non-technical skills:

- Cognitive, social and personal resource skills: plan, prioritise, monitor, anticipate, make decisions, work effectively in a team

Aeromedical Non-Technical Skills framework (AeroNOTS)

Observed behaviours rated – scored between 5 (excellent/ exemplary) and 1 (poor/required behaviour absent)

Task Management

Teamwork

Situational awareness

Decision making

Applying a non-technical skills (NTS) rating system in an aeromedical clinical setting

- Initial evaluation – field observations (Sweden, NZ) and survey (purposive sampling, international, physicians, flight nurses, paramedics)

- Clinical simulation study – standardised evaluation, rating the NTS of clinicians with and without aeromedical experience

Aims and hypotheses

Aim: Evaluate the NTS rating system (AeroNOTS) in a simulated aeromedical clinical setting

***A priori* assumptions and hypotheses:**

- Clinicians with experience in the setting will demonstrate superior NTS (as measured by the rating framework)
- NTS will correlate with general clinical performance (observed and self-rated)

Method: simulation scenarios

- Clinicians with and without inter-hospital transport complete simulated critical care air transport scenario
- Phase 1: Assume care for a ventilated patient in a regional ED - plan/prepare for transport to Wellington ICU
- Phase 2: Flight phase of the transport - patient ultimately develops rapid AF, requires defibrillation

Method: Rating scores and analysis

- NTS performance: independently rated by blinded assessors using the AeroNOTS framework
- Observed and self-rated general clinical performance ratings also collected
- Rank-based statistical tests: differences in performance experienced vs inexperienced clinicians; relationships between different assessment approaches and assessors.

Results

- 16 physicians: speciality training programmes (intensive care, emergency medicine and anaesthesia)

NTS and general clinical performance (observed):

- AeroNOTS ratings: higher for clinicians with inter-hospital transport experience ($p = 0.001$)
- General performance scores: higher for clinicians with inter-hospital transport experience ($p = 0.003$)

Results

NTS and general performance ratings

- High correlation – NTS and general clinical performance (all clinicians, $r_s = 0.9$, $p = 0.001$).

Self-ratings of general clinical performance:

- No difference experience vs inexperience ($p = 0.32$)
- No strong association with either of the 'observed' measures (general performance, $r_s = 0.4$, $p = 0.11$; NTS skills ($r_s = 0.4$, $p = 0.1$).

Discussion

- Aeromedical NTS framework distinguished higher and lower levels of performance (simulated inter-hospital transport setting)
- Scores correlated with the observed general performance and experience of the clinician
- Self-ratings less useful for distinguishing between higher and lower levels of performance

Conclusion

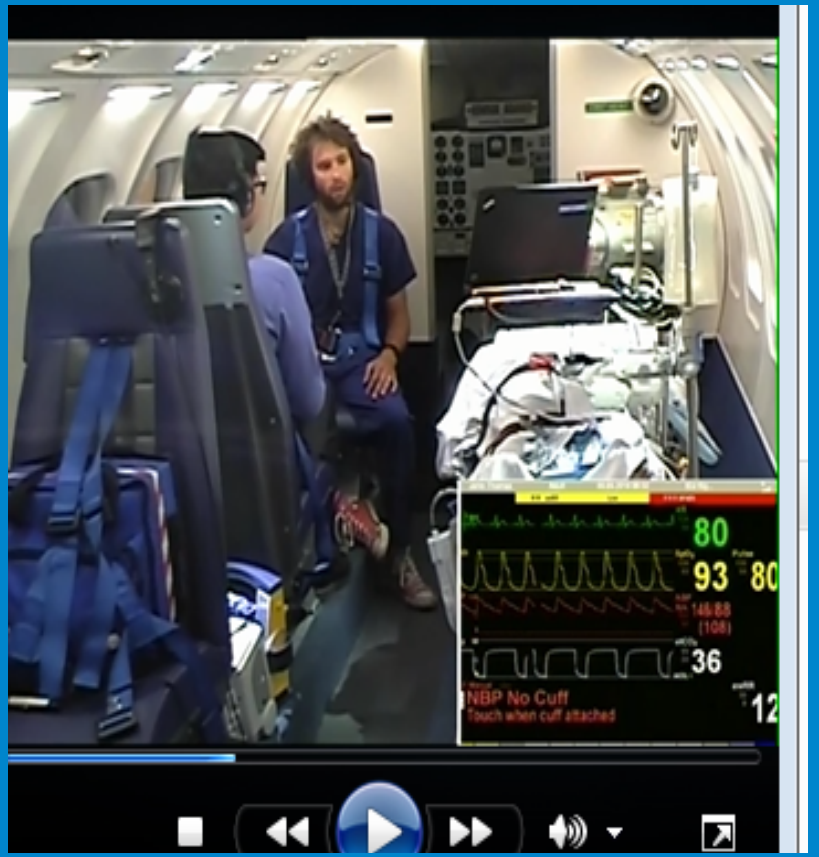
This framework could be useful in:

- Identifying when specific non-technical factors are likely to break down in the air ambulance environment

- Facilitating a structured approach to training and formal assessment

Future research

- Impact of fatigue in the aeromedical transport setting
- Randomised crossover trial, clinicians as their own controls
- *Hospi's* Air Ambulance simulator (Wellington Regional Hospital)



Acknowledgements

Simulation and Skills Centre – Wellington Regional Hospital

Wellington ICU Flight Service and clinical staff

*Myers JA, Powell DM, Aldington S, Psirides A, Hathaway K, Haney MF. Non-technical skills evaluation in the critical care air ambulance environment: introduction of an adapted rating instrument - an observational study. Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine 2016; 24: 24