Human Factors in ENT

A multidisciplinary simulation programme to improve patient safety.

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Background:

Safety within surgery has never been more topical. It is now recognised that the technical expertise of the operating surgeon alone is insufficient for achieving safer surgery. Surgical patients are at most risk of being involved in adverse medical events, with poor communication found to be a factor in 43% of errors made in surgery(1). These “non-technical skills” (or Human factors) are critical to patient safety and an important part of a surgeon’s competency. ENT emergencies, particularly airway related, often require excellent levels of communication and teamwork between surgeons, anaesthetists and scrub practitioners. Despite this there is a lack of ENT team simulation training with dedicated formal assessment.

Objectives:

1. Develop a psychometrically robust assessment tool for assessing Non-technical skills in ENT
2. Develop and validate an ENT themed multidisciplinary simulation programme for the assessment and feedback of Non-technical skills.

Methods:

A multidisciplinary team training day involving ENT and airway themed crisis’ in a simulated theatre environment was designed. Scenarios were developed based on the real-life experiences of faculty. Surgeons, anaesthetists and scrub nurses of varying grades of experience participated in 6 MDT training days. Trainees were assessed using a novel developed tool (ENT-NOTECHS) to demonstrate reliability and validity

Results:

A total of 74 trainees participated in the MDT simulation training days. A total of 6 simulation training days were undertaken over a 15 month period.

Initial reactions were excellent with 100% of trainees agreeing that the training was beneficial and a good method to train teamwork and leadership. Feedback from a 5 point likert evaluation questionnaire was used to assess face and content validity for the simulation training day. A score of 4 out of 5 was considered acceptable for face and content validity. Figure 1 shows the results of the post course evaluation and subsequent face and content validity

A	The simulation today addressed my learning needs
B	The scenarios in the simulations were realistic
C	The simulated environment was as realistic as a real operating theatre
D	The team interaction during the scenarios was realistic
E	The model was a realistic representation of the real procedure
F	I behaved in the same way i do in the workplace
G	My performance was similar to that in the workplace
H	The simulation replicated the likely level of stress amongst team members
I	The simulated procedure is a good method to train technical skills
J	The simulated scenario is a good method to train team skills and leadership
K	Participation helped me to improve my technical skills
L	Participation helped me to improve my teamwork and leadership skills
M	Scenario Simulation is useful to help increase confidence in managing real life crisis scenarios.

Figure 1: face and content validity

A Pre and post course “Attitudes and Confidence Questionnaire”

regarding Non-technical skills and team training was completed by all trainees. There was a significant increase in attitudes/confidence scores following the training day (figure 2).

Figure 2 (above:) Mean pre and post simulation scores for confidence and attitudes

ENT and Anaesthetic MDT theatre simulation - Surgeon										
Trainee name:		Speciality and Grade:								
Scenario:		Date:								
Rating	n/a	0	1	2	3	4	5			
ISCP ratings		not applicable	not done	done very well	done poor	satisfactory	done well	done very well		
		Development required (D)								
TECHNICAL ASSESSMENT (GLOBAL):										
Knows steps of operation and follows agreed logical sequence.		n/a	0	1	2	3	4	5		
Consistently handles tissues with minimal damage										
Uses instruments appropriately and safely										
Familiar with instruments and names										
Proceeds at appropriate pace with economy of movement										
Planned course of operation with effortless flow										
TECHNICAL ASSESSMENT (TASK SPECIFIC):										
Safe and diligent use of the laser										
Ensures adequate protection to teeth and gums from scope										
Inserts appropriate scope to visualise pathology and secure suspension device safely										
Demonstrates competency at efficient cutting technique with laser including economy of movement and avoidance of scatter/ splash etc.										
CATEGORY	ELEMENT	n/a	0	1	2	3	4	5		
PRE-OP CHECKS	gathers relevant information/ investigations and informs colleagues appropriately									
	discusses with anaesthetic team regarding anaesthetic plan for patient									
	if appropriate, specifically discusses contingency plan/Plan B with anaesthetist/airway concerns likely									
	gives effective briefing to team members									
	makes any relevant equipment checks									
COMMUNICATION AND INTERACTION	ensures WHO completed (consent and side of surgery checked) and any issues addressed									
	informs anaesthetist that he/she is starting operation									
	waits for acknowledgement from anaesthetist									
	instructions to scrub nurse/ assistant clear and polite									
	waits for acknowledgement from scrub nurse/ assistant									
LEADERSHIP AND MANAGEMENT	clearly follows theatre protocol and adheres to 'best practice' during procedure. fig no corner cutting									
	resource utilisation - appropriate task load distribution and delegation of responsibilities									
	Time management - appropriate time allocation: not too slow but does not rush team members									
	Authority and assertiveness									
	remains calm under pressure									
TEAMWORK	maintains positive rapport with all team members									
	open to opinions of other team members									
	supportive of other team members									
	conflict handling - concentrates on what is right rather than who is right.									
	monitors patient parameters throughout procedure									
SITUATIONAL AWARENESS	awareness of anaesthetist									
	actively initiates communication with anaesthetist during crisis									
	anticipates potential problems and shows evidence of contingency plan (e.g. equipment on standby)									
	promptly identifies problem									
	clearly informs team of change in situation (e.g. emergency)									
DECISION MAKING AND CRISIS MANAGEMENT	outlines strategy and initiates a plan (e.g. wait for auction, appropriate drug, airway equipment, glasses etc)									
	asks for opinion of other colleagues / team opinion									

Figure 3 (Right): ENT-NOTECHS tool

A Novel “ENT-NOTECHS” tool (figure 3) was developed to assess the nontechnical skills of trainees within the ENT theatre environment. This tool was assessed for validity and reliability. Excellent inter-rater reliability scores (cronbachs >0.7) were shown across all tool domains. Average ENT-NOTECH scores were calculated for 4 distinct groups: Junior (ST3-ST4), Intermediate (ST5-ST6), Senior (ST7-ST8) and Consultant (figure 4). Construct validity was demonstrated by showing a statistical difference in ENT-NOTECHS scores between the junior and consultant groups (P<0.001), and between the intermediate and consultant groups (P<0.05).

Figure 4: Mean ENT-NOTECHS scores for varying grades of trainees.

Conclusion:

Teams who work together should train together. The simulated operating theatre serves as an excellent environment for the assessment and training of non-technical skills. We have designed and developed a psychometrically robust tool for the objective structured assessment of these key skills. It should serve as a basis for focused feedback during training of team behaviours, with the ultimate goal of improving patient safety.