

Non-technical skills in emergency medicine and medical simulations – assessment scale - Ottawa

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- Human factors is the discipline or science of studying the interaction between humans and systems and technology; it includes, but is not limited to, principles and applications in the areas of human engineering, personnel selection, training, life support, job performance aids and human performance evaluation. Human error and system failures continue to play a substantial role in adverse outcomes in healthcare.
- Simulation scenarios cover technical skills (technical and therapeutic procedures) and non-technical skills, known as Crisis Resource Management (CRM). Non-technical skills in pediatric simulation are the skills of communication, leadership, teamwork, situational awareness, decision-making, resource management, safe practice, adverse event minimization, and professionalism, also known as behavioral skills or teamwork skills. High-fidelity simulation may indeed play a role in the evaluation of non-technical skills during and after medical faculty. Non-technical skills are skills complementary to a clinician's technical ability. These skills are not just desirable, they are essential for every physician.

- To date non-technical skills have been relatively over-looked in healthcare, with an emphasis on training the technical aspects of various tasks. This is, however, beginning to change due to the fact that failure in team-working skills and communication are contributing factors to errors and adverse events in pediatric hospitals. There is a need to improve the awareness and training of non-technical skills for emergency team members in all medical universities. The most recent version of the European Resuscitation Council Guidelines (2015) includes a section about education techniques, emphasising the importance of non-technical skills to improve resuscitation. In any situation, more than one of these skills is required, together with medical knowledge, to achieve the best possible outcomes for all patients.
- Another very interesting non-technical skill is avoiding fixation error. A fixation error is a principle of crisis resource management wherein humans fail to revise a situation assessment in risky and dynamic systems or events. It can be defined as the persistent failure to revise a diagnosis or plan in the face of readily available evidence suggesting that a revision is necessary.

- One of the important non-technical skills in emergency medicine is stress management. The relationship between stress and performance in medical simulation is described as inverted U-shaped curve: performance is very low for a low level of stress and increases with an increased level of stress, up to a point after which performance decreases and becomes severely impaired. Excessive stress impairs non-technical skills in simulation including communication, as the leader becomes less receptive to suggestions and fails to share the mental model. During repeated simulation sessions a reduction in perceived stress levels by registrars was observed, while physiological stress was unchanged. Interestingly authors of this report noted significant inverse correlation between perceived stress levels experienced by participants and their non-technical performance. Learning through simulation could improve perceived stress management in critical situations.

- To facilitate effective training in non-technical skills, a reliable tool is required, which captures these skills robustly, can be used to identify strengths and weaknesses, and also to facilitate systematic, constructive feedback. There are several assessment instruments for non-technical skills including: The Anaesthetists' Non-Technical Skills (ANTS), Ottawa GRS and checklist, the Mayo High-Performance Teamwork Scale, OSCAR - Observational Skill-based Clinical Assessment tool for Resuscitation and others. The Ottawa GRS, an instrument developed for crisis resource management skill assessment, was designed for acute care physicians. It has well-defined rating scales for each of its categories. The validity and reliability of this instrument is well established and showed some practical primacy over e.g. ANTS.

Ottawa scale – assessment of non-technical
skills

OVERALL PERFORMANCE

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-------------------------------------------------------|---|--------------------------------------------------------------|---|-----------------------------------------------------|---|-----------------------------------------------------------------------------|
| Novice; all CM skills require significant improvement | | Advanced novice; many CM skills require moderate improvement | | Competent; most CM skills require minor improvement | | Clearly superior; few, if any CM skills that only require minor improvement |

I. LEADERSHIP SKILLS

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--------------------------------------------------------------------------------------------------------------|---|------------------------------------------------------------------------------------------------------------------------------------|---|----------------------------------------------------------------------------------------------------------------------------|---|-----------------------------------------------------------------------------------------------------------------------------------|
| Loses calm and control for most of crisis; unable to make firm decisions; cannot maintain global perspective | | Loses calm/control frequently during crisis; delays in making firm decisions (or with cueing); rarely maintains global perspective | | Stays calm and in control for most of crisis; makes firm decisions with little delay; usually maintains global perspective | | Remains calm and in control for entire crisis; makes prompt and firm decisions without delay; always maintains global perspective |

II. PROBLEM SOLVING SKILLS

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---------------------------------------------------------------------------------------------------------------------------------------------|---|---------------------------------------------------------------------------------------------------------------------------------------|---|-------------------------------------------------------------------------------------------------------------------------------------------------------|---|-------------------------------------------------------------------------------------------------------------------------------|
| Cannot implement ABC's assessment without direct cues; uses sequential management despite cues; fails to consider any alternative in crisis | | Incomplete or slow ABC assessment; mostly uses sequential management approach unless cued; gives little consideration to alternatives | | Satisfactory ABC assessment; without cues; mostly uses concurrent management approach with only minimal cueing; considers some alternatives in crisis | | Thorough yet quick ABC without cues; always uses concurrent management approach; considers most likely alternatives in crisis |

III. SITUATIONAL AWARENESS SKILLS

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|----------------------------------------------------------------------------------------------------------------------------------------------------|---|-------------------------------------------------------------------------------------------------------------------------------------|---|------------------------------------------------------------------------------------------------------------------------------------------------------|---|---------------------------------------------------------------------------------------------------------------------------------------------|
| Becomes fixated easily despite repeated cues; fails to reassess and re-evaluate situation despite repeated cues; fails to anticipate likely events | | Avoids fixation error only with cueing; rarely reassesses and re-evaluates situation without cues; rarely anticipates likely events | | Usually avoids fixation error with minimal cueing; reassesses re-evaluates situation frequently with minimal cues; usually anticipates likely events | | Avoids any fixation error without cues; constantly reassesses and re-evaluates situation without cues; constantly anticipates likely events |

IV. RESOURCE UTILIZATION SKILLS

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---------------------------------------------------------------------------------------------------------------------|---|-------------------------------------------------------------------------------------------------------------------|---|-------------------------------------------------------------------------------------------------------------------|---|-----------------------------------------------------------------------------------------------------------------------|
| Unable to use resources and staff effectively; does not prioritize tasks or ask for help when required despite cues | | Able to use resources with minimal effectiveness; only prioritizes tasks or asks for help when required with cues | | Able to use resources with moderate effectiveness; able to prioritize tasks and/or ask for help with minimal cues | | Clearly able to use resources to maximal effectiveness; sets clear task priority and asks for help early with no cues |

V. COMMUNICATION SKILLS

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--------------------------------------------------------------------------------------------------------------------------------|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----------------------------------------------------------------------------------------------------------------------------------------------|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Does not communicate with staff; does not acknowledge staff communication, never uses directed verbal/non-verbal communication | | Communicates occasionally with staff, but unclear and vague; occasionally listens to but rarely interacts with staff; rarely uses directed verbal/non-verbal communication | | Communicates with staff clearly and concisely most of time; listens to staff feedback; usually uses directed verbal/non-verbal communication | | Communicates clearly and concisely at all times, encourages input and listens to staff feedback; consistently uses directed verbal/non-verbal communication |

APPENDIX 2 – SIMULATOR SESSION CRISIS MANAGEMENT SKILLS CHECKLIST

| ACTION | YES (2 points) | With Prompting (1 point) | NO (0 points) |
|------------------------------------------------------|----------------|--------------------------|---------------|
| PROBLEM SOLVING | | | |
| Prompt ABC assessment | | | |
| Implements concurrent management approach (4 points) | | | |
| SITUATIONAL AWARENESS | | | |
| Avoids fixation error (4 points) | | | |
| Re-assesses and re-evaluates situation (4 points) | | | |
| RESOURCE UTILIZATION | | | |
| Calls for help when indicated | | | |
| Delegates and directs appropriately | | | |

| | | | |
|-------------------------------------------------|--|--|--|
| LEADERSHIP | | | |
| Maintains calm demeanor | | | |
| Acts decisively and maintains control of crisis | | | |
| Maintains global perspective | | | |
| COMMUNICATION | | | |
| Communicates clearly and concisely | | | |
| Closes the loop and uses names | | | |
| Listens to team input | | | |
| TOTAL SCORE (30 points) | | | |

Resident #:

Scenario #:

Staff #:

Date:

Thank You

