Voice & Touch Controlled Checklists
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Voice & Touch
Controlled Checklists
Simulation enables the study of various aspects of clinical practice that may not otherwise be measurable, and conditions may be controlled significantly more in the simulated setting (e-REAL installation).
To handle the complexity of the medical world, mnemonics and cognitive tools may work very well.

We are performing tests on the use of different communication channels to interact with the mnemonics, for example voice recognition or touch inputs for visual navigation, instead of simple reading from a printed output.
The amount of information and the level of detail included in checklists are among the most difficult issues to control during the development process of these tools.

There is no universal model of representation regarding iconography, text length, density of information, number of steps, colors, fonts, etc. regarding any of the elements involved in the system.
Different checklist templates have been released and usability tests are ongoing.

This is Template 0 from the Emergency Manual by Stanford Anesthesia Cognitive Aid Group.

Different visualizations of the same content are available in the following charts.
ASYSTOLE  FLAT LINE + NO PULSE

1. CPR
   - ≥ 100 compressions/minute
   - ≥ 2" deep
   - Allow complete chest recoil
   - Minimize breaks in CPR
   - Rotate Compressors q2 Min

2. Call for Help
   - Code Cart
   - Inform Team

3. Assess CPR Quality
   - High yield
   - No response
   - Suspect pneumothorax
   - Suspect perforation
   - Suspect hemorrhage
   - Suspect arrhythmia
   - Suspect hypothermia
   - Procedure end

4. Immediate
   - In OR: Turn OFF volatile; Increase to 100% O₂ or high flow
   - Ventilate 10 breaths/minute: do not over ventilate
   - Ensure IV access (or consider intraosseous)
   - Epinephrine - 1 mg IV push q 3-5 minutes
   - Consider: Vasopressin - 40 units IV
     (1, could replace 1st or 2nd epinephrine dose)
   - If rhythm changes to VT/VF (shockable rhythm) - Immediate Defibrillation. Go to VT/VF event.
   - Consider common perioperative DDx

5. Diagnose
   - Consider common perioperative DDx:
     - Hemorrhage,
     - Anesthetic overdose,
     - Septic or other shock states,
     - Auto PEEP,
     - Anaphylaxis,
     - Medication error,
     - High spinal,
     - Pneumothorax,
     - Local anesthetic toxicity,
     - Vagal stimulator,
     - Pulmonary Embolus

6. Assess CPR Quality, Improve IF:
   - ETCO₂ < 10 mmHg
   - Arterial line Diastolic < 20 mmHg

7. Call for Help
   - Code Cart
   - Inform Team

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CALL FOR HELP | CODE CART | INFORM TEAM

IMMEDIATE

1. Hypovolemia
2. Hypoxemia
3. Tension pneumothorax
4. Thrombosis coronary
5. Thrombosis pulmonary
6. Toxicity (eg infusions)
7. Tachycardia
8. Hypo- or Hyperkalemia

Hypovolemia: Administer rapid bolus of IV fluid and check hemoglobin / hematocrit. Give blood for anemia or massive hemorrhage. Consider relative hypovolemia: Auto-PEEP - disconnect circuit; High spinal; or shock states (eg anaphylaxis) - Go to relevant specific events.

DIAGNOSE

ASYSTOLE FLATLINE + NO PULSE

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   - Allow complete chest recoil
2. Minimize breaks in CPR
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Assess CPR Quality, Improve IF:
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IMMEDIATE

1. V/Q mismatch
2. Pulmonary embolism
3. Pneumothorax
4. Hypoxemia
5. Hypertension
6. Anaphylaxis
7. Hypovolemia
8. Thrombosis coronary
9. Thrombosis pulmonary
10. Tension pneumothorax
11. Pericardial tamponade
12. Cardiac arrest
13. Septic shock
14. Major hemorrhage
15. Other life-threatening conditions

DIAGNOSE

Consider common peroperative Ddx:
- Hemorrhage,
- Anesthetic overdose,
- Septic or other shock states,
- Auto-PEEP,
- Anaphylaxis,
- Medication error,
- High spinal,
- Pneumothorax,
- Local anesthetic toxicity,
- Vasal stimulation,
- Pulmonary Embolus
Communication patterns, knowledge visualization strategies and techniques, and the ways to interact with the checklist are other challenging issues.
The main research hypothesis is that visualization and voice recognition can improve any complex operational process better than simple checklist reading by a member of the healthcare team.
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