ICU simulation scenario

Title: Failed Intubation
Target Audience: ICU staff
Location: ICU or Theatre

Learning objectives:
- Difficult Airway Society guidelines
- Use of LMAs as a rescue technique
- About the difficult airway trolley (location & equipment)
- Situational awareness, decision making, teamwork, calmness under pressure

Storyboard:
26 year old fit male admitted via ED following an RTA. GCS 14 in ED. CT brain: frontal contusion only therefore not intubated. C spine not cleared. Pelvic fracture in SAM splint. Neurological deterioration necessitates intubation. Failed intubation follows (manikin is impossible to intubate), with desaturation. Saturations will recover to 80s with 2 person technique plus adjunct, to 90s with LMA or cricothyroidotomy.

Equipment:
- Mega Code Kelly /3G with Sim Man on patient monitor (laptop and LCD screen)
- Tongue inflated to make a difficult intubation but can insert an LMA
- Neck collar & neck immobilization kit
- Hudson mask with reservoir bag, Waters circuit, capnography
- Difficult airway trolley / bag, laminated failed intubation drill e.g. DAS guidelines (if normally kept on the unit)

Personnel:
- 2 doctors
- 3 nurses

Faculty:
- Facilitator
- Computer operator

Progression of scenario:
Patient handed over between nursing shifts. Last GCS 14 (mild confusion) and now ‘asleep’. New nurse should do checks and realize that poorly conscious (GCS 7: E1 V1 M4 flexion withdrawal). Should call doctor. Doctor assesses and GCS now 4 (E1 V1 M2 extending). Decision should be made to intubate for CT scan.

- Intubation will fail
- Rapid desaturation if not pre-oxygenated
- No anaesthetist or senior help is available
- Saturations can be restored to 80s by 2 person technique with adjunct, to 90s with LMA or cricothyroidotomy
- If there are more than three attempts at intubation (which will all fail) subsequent bag/mask or LMA ventilation will be less successful and saturations will drop and bradycardia ensues (due to airway trauma and swelling)
- If poorly managed, bradycardia, PEA then asystole follow. Scenario stops after LMA/cricothyroidotomy or 2 minute cycle of CPR.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Airway</th>
<th>Breathing</th>
<th>ETCO2</th>
<th>Sats</th>
<th>HR</th>
<th>BP</th>
<th>CNS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start</td>
<td>Snoring</td>
<td>Normal BS RR 7</td>
<td></td>
<td>98</td>
<td>52</td>
<td>170/90</td>
<td>‘Asleep’</td>
</tr>
<tr>
<td>Nurse check</td>
<td>Obstructed</td>
<td>Clear chest RR 7</td>
<td>92</td>
<td>52</td>
<td>170/90</td>
<td>E1V1M4 = 7</td>
<td></td>
</tr>
<tr>
<td>Doctor check</td>
<td>Obstructed</td>
<td>Clear chest RR 7</td>
<td>90</td>
<td>52</td>
<td>170/90</td>
<td>E1V1M2 = 4</td>
<td></td>
</tr>
<tr>
<td>Intubation attempt without preO2</td>
<td>Can’t intubate</td>
<td>Clear chest Ventilated</td>
<td>Absent</td>
<td>70</td>
<td>40</td>
<td>180/100</td>
<td>Sedated</td>
</tr>
<tr>
<td>BMV 2 person with adjunct</td>
<td>Can ventilate</td>
<td>Clear chest</td>
<td>Obstructed trace</td>
<td>84</td>
<td>52</td>
<td>170/90</td>
<td>Sedated</td>
</tr>
<tr>
<td>LMA or cric</td>
<td>Can ventilate</td>
<td>Clear chest Good chest expansion</td>
<td>Normal trace 50mmHg</td>
<td>92</td>
<td>52</td>
<td>170/90</td>
<td>Sedated</td>
</tr>
<tr>
<td>Repeated attempts, no LMA or cric</td>
<td>Difficulty increases</td>
<td>Poor chest expansion</td>
<td>Obstructed trace</td>
<td>78</td>
<td>44</td>
<td>180/100</td>
<td>Sedated</td>
</tr>
</tbody>
</table>

Information for the candidates:

Frank Ireland is a previously fit and well 26 year old gentleman who has been involved in an RTA today. He was the driver of a motorcycle which crashed into a car. He had loss of consciousness at the scene but on review in ED his GCS had increased to 14/15 (E4, V4, M6). Injuries include a pelvic fracture in a SAM splint, due to be operated later tonight. He was initially hypotensive from this and had 2 litres of fluid in ED. He is now haemodynamically stable. His CT head shows a frontal contusion. Neurosurgery has seen him and he is to be managed conservatively. CT C-spine was normal but his neck is not cleared due to distracting injuries. He has a hard collar on and needs to be log rolled. He has been in ICU for 4 hours. During this time he has been stable, talkative, though a little confused at times. He is now asleep after some morphine. Last GCS 14 (lost 1 mark for mild confusion).

Information for the faculty:

Needs to have neuro exam early to detect decreasing GCS. If no neuro exam done prompt candidates that airway sounds obstructed.

Escape routes:

If repeated attempts at intubation patient will deteriorate. If heading towards PEA / asystolic arrest without LMA or cric, ICU consultant can ring in and suggest. Otherwise stop scenario after 2 minute cycle of CPR.
Debriefing: (GROW model)

Goals (what was going on? what was the diagnosis?)

- Decreased GCS: likely exacerbation of intracranial bleed with unprotected airway
- Failed intubation with difficult ventilation

Realism: (was the scenario realistic? If not did this impact on decision making?)

Outcome/ options: (what went well? what could be done differently? what were the treatment options? what human factors were highlighted?)

- Recognition of failed intubation and difficult ventilation
- Failed intubation drills e.g. Difficult Airway Society Guidelines
- Difficult airway trolley – what’s on it, where is it on the unit

Ways forward: (what were the main learning points? what will you take home from the scenario?)