Cože ????
Anestesiologové a intenzivisté dělají chyby?

Tomáš Henlín
The Success Loop

Try
Again
Fail
Get Up
Polytrauma?

Není trauma jako trauma....
Enrollment of trauma patients

\( n = 20,671 \)

Excluded:
- ISS < 18 \( n = 18,017 \)
- Burn \( n = 896 \)
- Incomplete registered data \( n = 129 \)

Polytrauma
\( n = 369 \)

Non-polytrauma
\( n = 1260 \)

Figure 1

Flow chart of the studied polytrauma and non-polytrauma population.
Analgesia in Polytrauma

Primary Trauma Survey/ Identification of immediate life threats

Consider intubation & general anesthesia:
- Airway or respiratory compromise
- Early or ongoing hemodynamic instability
- Anticipated early operative intervention
- Injury causing uncontrollable pain or distress
- Severe agitation

Multiple Injuries or Severely Painful Injuries

Red: Profound/Refractory Shock
- Loss of central pulses
- Systolic BP < 70 mmHg
- All efforts focused on identification and treatment of shock
- Decreased level of consciousness/obtundation is the rule
- Consider withholding analgesia until hemodynamics improved

Yellow: Shock/Occult Shock
- Poorly perfused extremities
- Loss of peripheral pulses
- Isolated or persistent SBP < 105 mmHg
- Shock index > 0.9
- Base deficit ≤ -6.0
- Fentanyl 0.5 mcg/kg IV
- Ketamine 0.1-0.3 mcg/kg IV over 10-20 minutes

Green
- Fentanyl 1-1.5 mcg/kg IV
- Morphine 0.1 mg/kg IV
- Ketamine 0.2-0.3 mcg/kg IV over 10-20 minutes

Throughout Resuscitation
- Reassess hemodynamics, analgesia q10-15 min
- Repeat bolus analgesia to effect
- Consider non-pharmacological adjuncts to alleviate pain

Consider Maintenance Infusions
- Titrate to effect
- If intubated, add sedative drip as needed
- Fentanyl 2 mcg/kg bolus then 1 mcg/kg/hour IV
- Morphine 0.1 mg/kg bolus then 0.1 mg/kg/hour IV
- Ketamine Non-intubated (analgesia) 0.3 mcg/kg/hour IV
- Ketamine Post-intubation (dissociation) 1 mcg/kg/hour IV

Non-pharmacological adjuncts
- Early discontinuation of spinal immobilization (long board, rigid collar) when clinically appropriate
- Reduce and splint/immobilize injuries, including open fractures/dislocations, bony pelvic injuries (stable or unstable) and significant soft tissue/burn injuries
- Foley catheter to decompress bladder
- Pre-procedure patient briefing for anticipated painful procedures
Full Moon by Jim Allen

PIP, PEEP, VAP, NIP, WOB, PAWP, MOV, BOOP...

HEY, HE SPEAKS OUR LANGUAGE!!
Airway and ventilation management strategies for hemorrhagic shock. To tube, or not to tube, that is the question!

Anthony J. Hudson, MA, Geir Strandenes, MD, Christopher K. Bjerkvig, MD, Marius Svanevik, MD, and Elon Glassberg, MD, MHA, Devon, UK
### Table 2 Flow rates of devices

<table>
<thead>
<tr>
<th>Intravenous Catheter</th>
<th>Rate of flow with gravity (mL/min)</th>
<th>Rate of flow with pressure (mL/min)</th>
<th>Percentage increase with Biometer</th>
<th>Percentage decrease with Biometer</th>
</tr>
</thead>
<tbody>
<tr>
<td>14G 50 mm cannula</td>
<td>230.1</td>
<td>128.3</td>
<td>63.7%</td>
<td>43.4%</td>
</tr>
<tr>
<td>14G 14 cm Alacath</td>
<td>366.2</td>
<td>120.3</td>
<td>95.5%</td>
<td>33.9%</td>
</tr>
<tr>
<td>18G 50 mm cannula</td>
<td>154.7</td>
<td>129.6</td>
<td>116.2%</td>
<td>29.2%</td>
</tr>
<tr>
<td>14G 15 cm Leadercraft</td>
<td>211.3</td>
<td>102.1</td>
<td>100%</td>
<td>13.0%</td>
</tr>
<tr>
<td>18G 45 mm cannula</td>
<td>90.1</td>
<td>80.3</td>
<td>56%</td>
<td>-18.1%</td>
</tr>
<tr>
<td>18G double port triple lumen cannula</td>
<td>69.4</td>
<td>70.4</td>
<td>97.0%</td>
<td>2.0%</td>
</tr>
<tr>
<td>20G 33 mm cannula</td>
<td>64.4</td>
<td>56.5</td>
<td>63.2%</td>
<td>-9.1%</td>
</tr>
<tr>
<td>20G 25 mm cannula</td>
<td>35.7</td>
<td>26.7</td>
<td>100%</td>
<td>-2.80%</td>
</tr>
<tr>
<td>18G proximal port triple lumen cannula</td>
<td>29.7</td>
<td>20.7</td>
<td>167%</td>
<td>-3.37%</td>
</tr>
</tbody>
</table>

Figure from Reddick et al, 2011

### Size

<table>
<thead>
<tr>
<th>Type</th>
<th>1000ml infusion time</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.5 Fr RIC Line</td>
<td>0:46 sec</td>
</tr>
<tr>
<td>7 Fr RIC Line</td>
<td>1:00 min</td>
</tr>
<tr>
<td>8.5 Fr Sheath introducer</td>
<td>1:05 min</td>
</tr>
<tr>
<td>14 Ga Standard IV cannula</td>
<td>1:30 min</td>
</tr>
<tr>
<td>6 Fr Sheath introducer</td>
<td>2:10 min</td>
</tr>
<tr>
<td>14 Ga Angiocath (13.3cm) IV</td>
<td>2:10 min</td>
</tr>
<tr>
<td>16 Ga Standard IV cannula</td>
<td>2:20 min</td>
</tr>
<tr>
<td>18 Ga Standard IV cannula</td>
<td>4:23 min</td>
</tr>
<tr>
<td>14 Ga 4-Lumen CVC</td>
<td>5:20 min</td>
</tr>
<tr>
<td>20 Ga Standard IV cannula</td>
<td>6:47 min</td>
</tr>
</tbody>
</table>

https://etmcourse.com/large-bore-iv-access-showdown
SBP and Time to OR
Impact on Mortality after Injury

Mortality (%) vs Injury to Operating room time (minutes)

- SBP < 60 mm Hg
- SBP 60-90 mm Hg
- SBP 90-110 mm Hg
- SBP > 110 mm Hg

Alarhayem, Eastridge: No Time to Bleed. Presented at Southwestern Surgical Congress 2017
1. Nechodíte tam...
2. Chodíte tam...
3. Uspáváte je...
4. Intubujete je...
5. Pícháte je...
6. Chcete dělat medicínu...
7. Nereagujete včas...
8. JEDINÝM VAŠÍM CÍLEM BY MĚLO BÝT...
WHAT REBELS WANT from their boss...

1. WE ARE NOT TROUBLE MAKERS
   We are motivated to make our org BETTER
   WHY? why? not?

2. WE CARE about work more than anyone else
   THAT’S WHY WE ARE WILLING TO RISK IN A CONFLICT

3. WE NEED AN ENVIRONMENT
   where it is safe to disagree and challenge
   STATUS QUO
   AND THAT’S A GOOD THING

4. LOVE OUR DIFFERENCES AND QUIRKS
   we may not be like you
   THERE’S NO BUDGETS
   NO RESOURCES

5. CHALLENGE US
   give us thorniest problems
   LET US PROVE OUR WILD IDEAS AT WORK
   WE WANT TO BE STRETCHED

6. DON’T GIVE US LIP SERVICE
   Tell us as it is NO GLIB LIKE

7. COACH US on how
   to navigate org. politics
   so we avoid making mistakes

8. REBELLIOUSNESS IS A POSITIVE BEHAVIOR
   it is an act of courage and risk taking
   WELL DONE!

9. APPRECIATE US
   and we’ll move mountains for you.

Insights from: RebelsatWork.com
Sketchnote by: Tanmay Vora | @tnvora | QA@spire.com
Velmi Samostaný Anesteziolog Inspirován Pícháním na Medicíně
Dynamicky Krvácí