

Goal Directed Fluid Therapy

- 1 Does your patient qualify?
- 2 Fluid management algorithm
- 3 FAQs
- 4 Interpreting SPV/PPV with the GE monitor

Goal Directed Fluid Therapy Team

Attendings:

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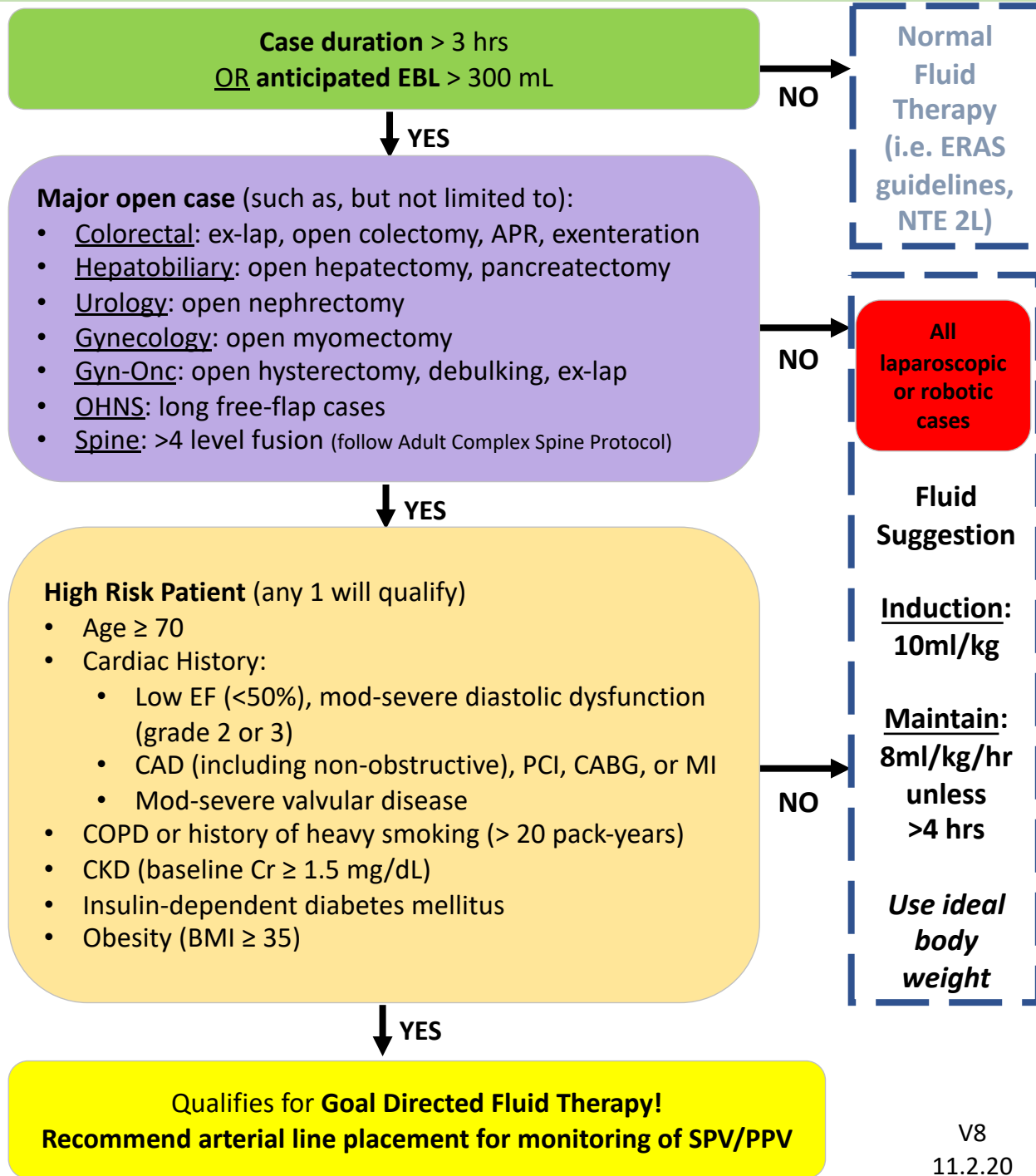
CRNAs:

Jon Flores
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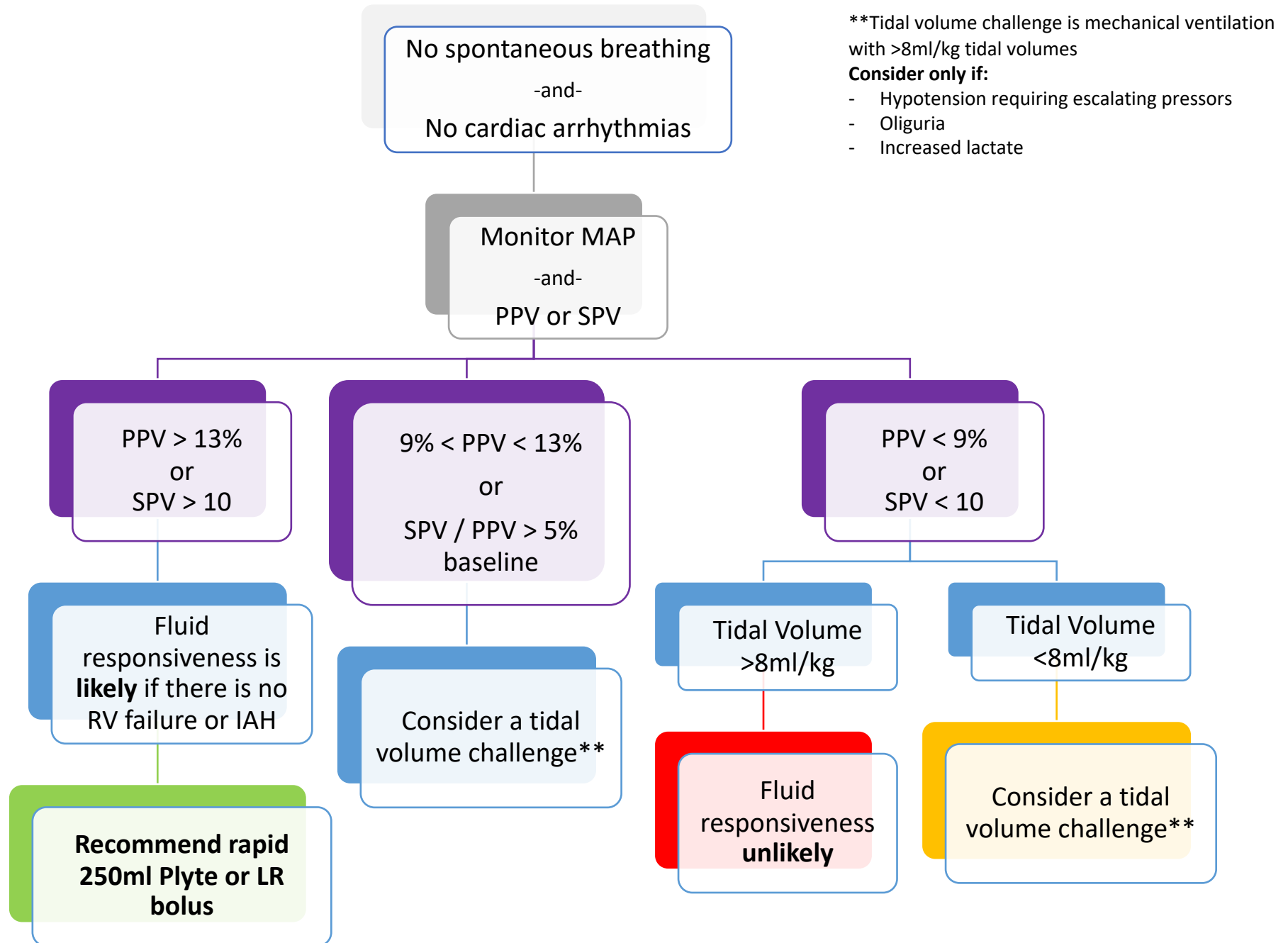
Residents:

Catherine Chiu
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1. Does your patient qualify?



2. Fluid management algorithm



3. FAQs

What Crystalloid Solution is Preferred?

Plasmalyte

LR is an acceptable alternative

Do not use 0.9% NaCl (normal saline) unless for a specific indication

What about Colloid Products?

Should not be 1st line therapy

Acceptable to switch to Albumin (5%) if:

rapid resuscitation is needed, EBL>1L, Crystalloid > 3L, or other specific indication

Continue GDFT with 250mL albumin boluses

Do not use Hextend/Hetastarches

What about Blood Products?

Transfuse pRBCs to maintain Hgb > 7 g/dL intraop (or Hgb > 8 if actively bleeding)

Administer FFP/platelets instead of Plyte/LR/Albumin if clinically indicated

Any other caveats?

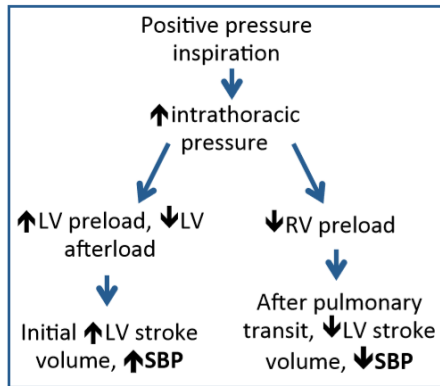
Spine Cases: Please follow the Adult Complex Spine Deformity Surgery Anesthesia Protocol

If patient is prone, SPV and PPV may **not** be a good prediction of fluid responsiveness for:

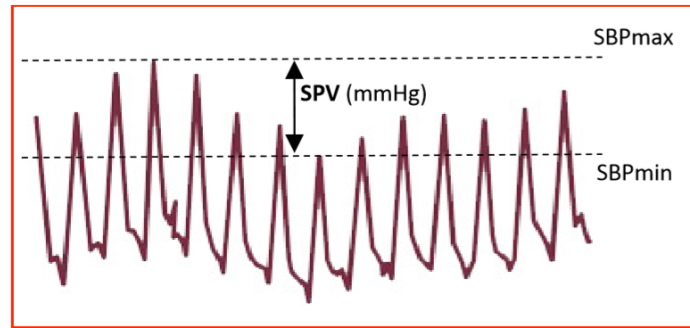
- BMI > 30, or
- Low lung compliance, i.e. peak pressures > 30 cmH2O

Anesthesiologists **may abort GDFT algorithm at any time** if patient is not improving or the algorithm is thought to be harming the patient's condition

4. Interpreting SPV/PPV with the GE monitor



Systolic Pressure Variation (SPV)



“Every breath is a bolus”

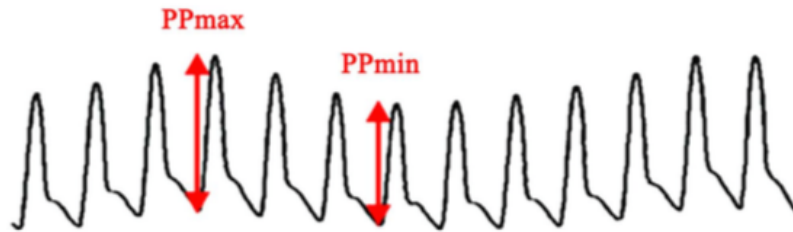
If respiratory variation is creating differences of SBP such that **SPV is greater than 10mmHg**, in the right clinical context this is suggestive that patient may be fluid responsive.

If SPV is less than 10mmHg, there could be other reasons causing soft blood pressures, and additional fluids are less likely to help.

Display SPV on GE Monitor: select Monitor Setup, select Screen Setup; select Lower Parameter Area; in an unused space scroll up to SPV. (displays averaged SPV value in mmHg updated serially, also displays PPV %)

Manually calculate SPV on GE Monitor: select SPV window; allow curve to be drawn, select Freeze; adjust SBPmax and SBPmin lines with toggle buttons. (displays this SPV value in mmHg until next manual calculation)

Pulse Pressure Variation (PPV)



$$PPV = \frac{PP_{max} - PP_{min}}{PP_{mean}} \times 100$$

PPV > 13% : likely fluid responsive
 PPV < 9% : not fluid responsive
 9% < PPV < 13% : “gray zone”

- Limitations
- Requires arterial BP monitoring
 - Extreme bradycardia or high RR
 - Arrhythmia/irregular HR (e.g. atrial fibrillation)
 - ↑intra-abdominal pressure (e.g. pneumoperitoneum)
 - Open thorax
 - Spontaneous ventilation, low tidal-volume ventilation
 - Low arterial compliance (high-dose vasopressors, severe atherosclerosis/PVD)
 - RV and/or LV failure

References:
 PMID 21906322 and PMID 19602972
 Miller’s Anesthesiology 8th ed. 2015
 Michard F, Anesthesiology 2005