Elaborated by Dr J Vogel
13 September 2010

Guideline – RE-INTUBATION

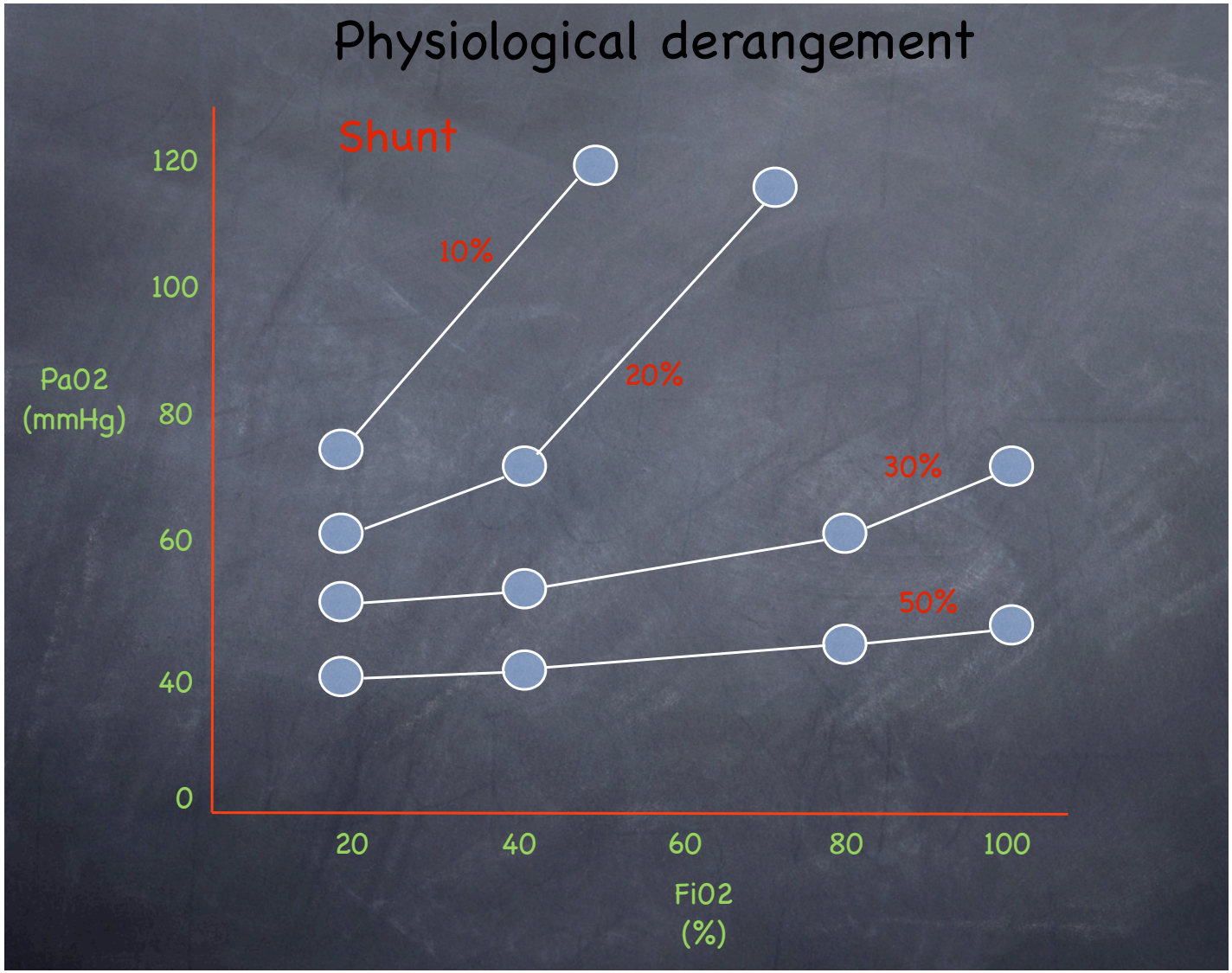
Introduction :

The need to reintubate a patient may be one of the **most dangerous maneuvers** you will perform in ITU.
This cannot be emphasized this strongly enough.

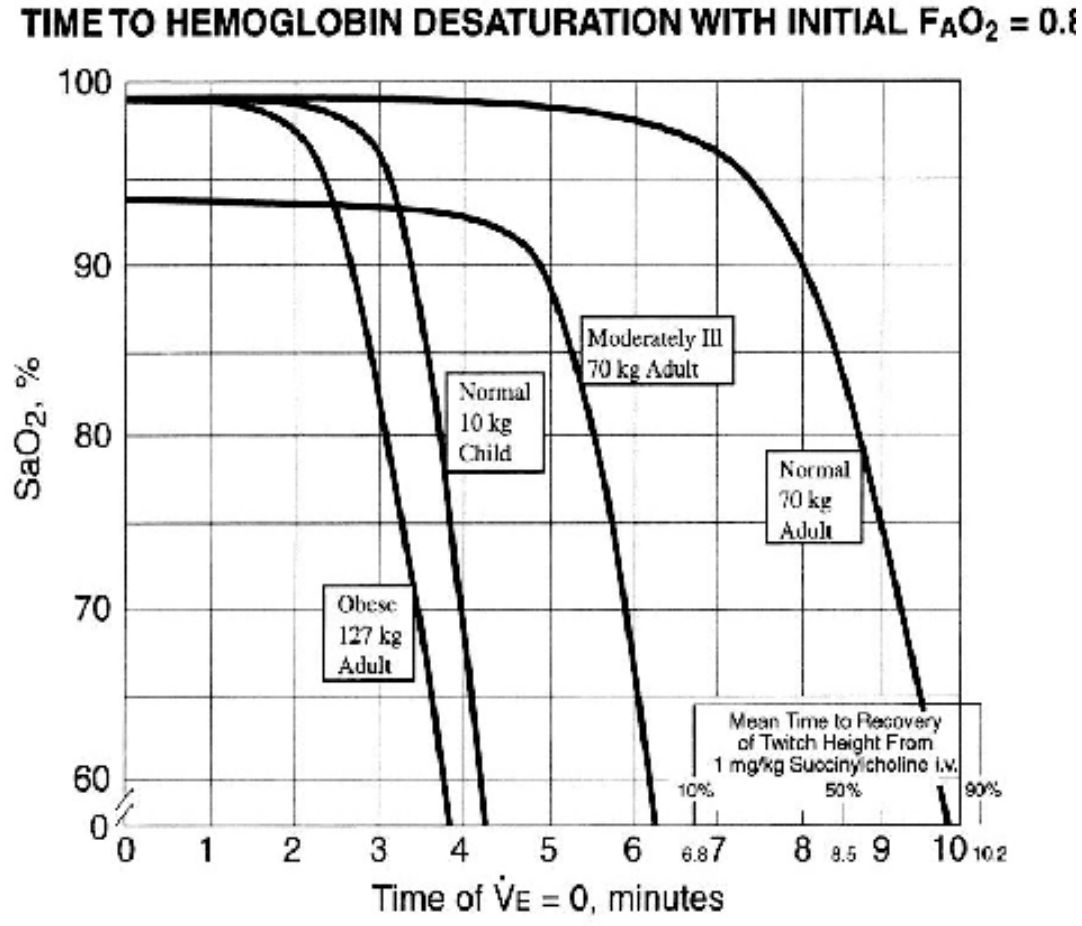
Why is this so dangerous?

• *Large Shunt*

The type of patient most likely to develop a leak is one requiring high ventilatory pressures (i.e., they have stiff lungs). These are the very type of patient who have a large shunt. Therefore pre-oxygenation will achieve very little (see diagram).


Physiological derangement
Shunt
120
100
80
60
40
0
Pa02
(mmHg)
10%
20%
30%
50%
20
40
60
80
100
Fi02
(%)

• *Patient de-saturates rapidly.*



- *Stiff lungs making mask ventilation difficult/impossible*

The normal opening pressure of the upper oesophageal sphincter is of the order of 25 cm H20. A normally compliant lung will inflate at < 20 cm H20. A stiff “sick” lung will need in excess of 25 cm H20 (assuming you have a perfectly patent airway). Therefore the line of least resistance is straight into the stomach and not the lung.

•*The patients larynx will be swollen.*

The high ventilatory pressures will cause high central venous pressures which will reduce venous and lymph drainage causing the larynx to swell. It will be splinted open by the ETT until you pull it!

• *A normal dose of muscle relaxant will not paralyse the larynx.*

Distribution of positively charged ammonium ions (i.e., muscle relaxants) limits molecules to the extracellular fluid, all have a small volume of distribution ~0.2 l/kg. However, septic patients may easily double their volume of extra cellular fluid (one of the markers of a sick patient is the amount of wet weight they put on).

Therefore, if you are going to paralyse the patient to aid in re-intubation, **always use a nerve stimulator!**

This may make intubation even over a bougie difficult (the non paralysed larynx will “grip” the bougie in spasm). This will result in trauma to the larynx and even more swelling/spasm.

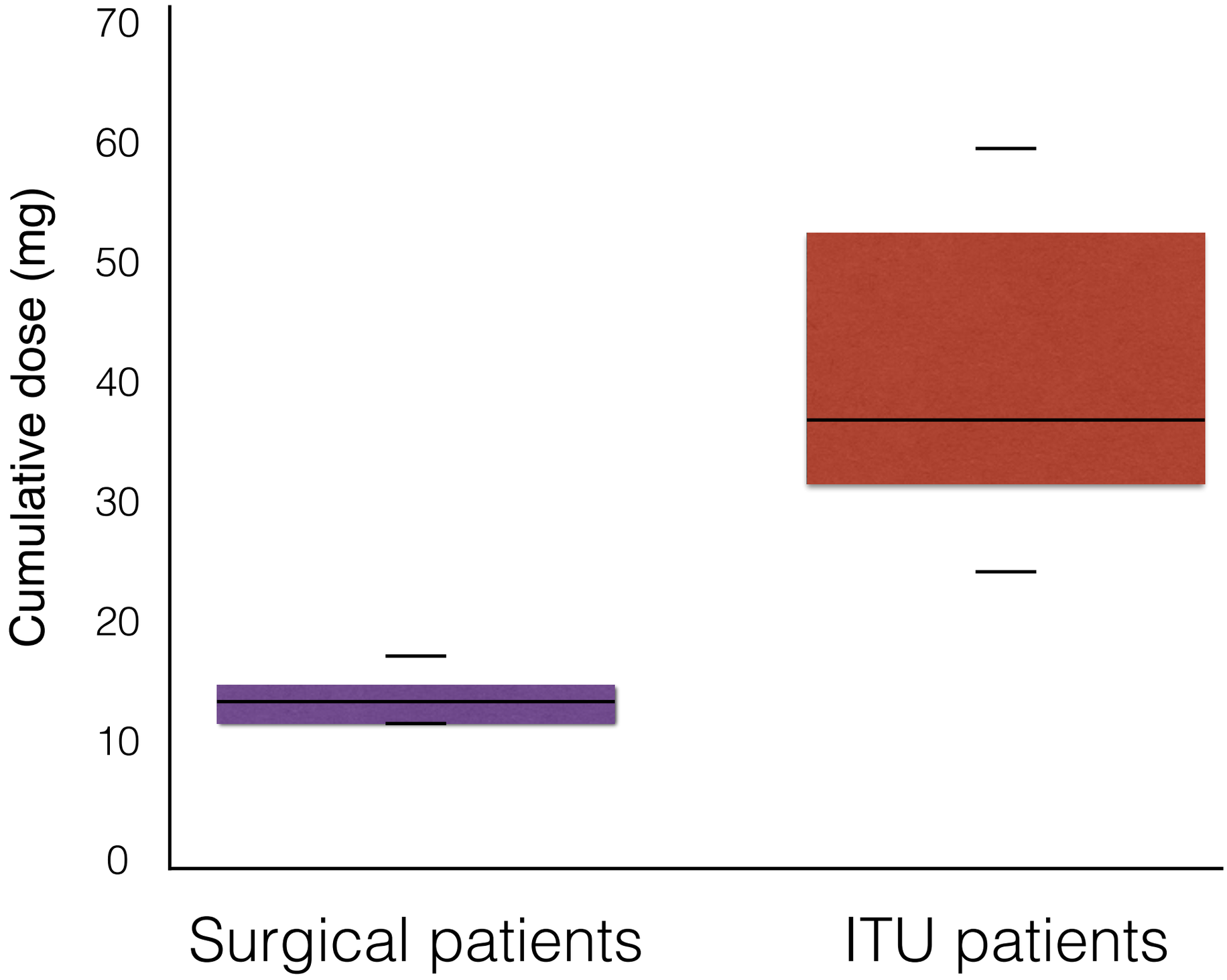
Bottom Line :

NEVER UNDERTAKE THIS LIGHTLY.

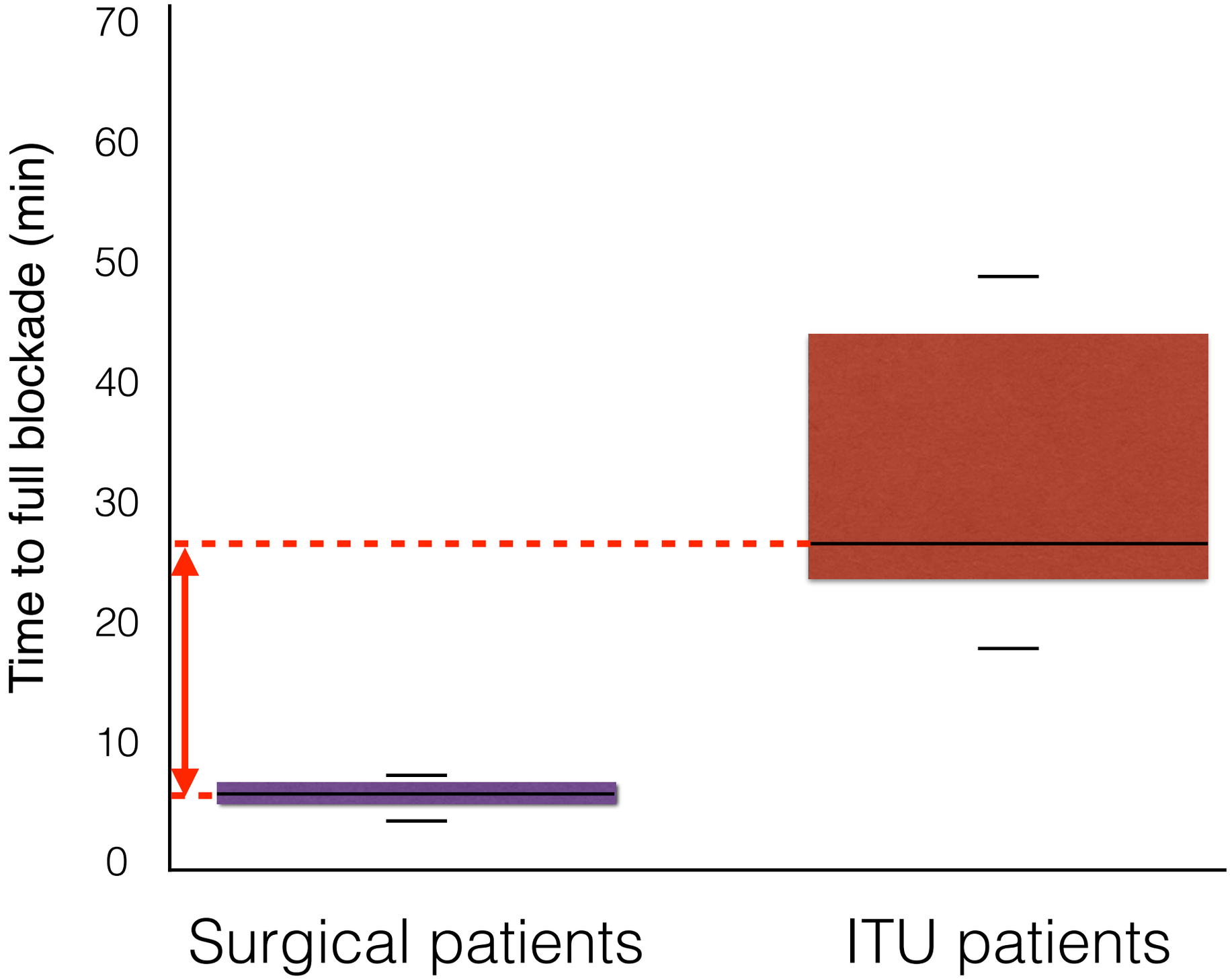
ONLY CHANGE THE TUBE ONCE YOU HAVE TRIED EVERYTHING ELSE.

ALWAYS HAVE LOTS OF BACK UP in both material and most importantly man-power (i.e., have a medical colleague and nurse along side).

Cumulative doses of cisatracurium



Time of neuromuscular blockade



The Limits of Succinylcholine for Critically Ill Patients

Antonia Blanié, MD, Catherine Ract, MD, Pierre-Etienne Leblanc, MD, Gaëlle Cheisson, MD, Olivier Huet, MD, Christian Laplace, MD, Thomas Lopes, MD, Julien Pottecher, MD, Jacques Duranteau, MD, PhD, and Bernard Vigué, MD, PhD

In a prospective, observational study, 131 critically ill patients intubated with succinylcholine

Potassium measurements made before and after (Kafter) succinylcholine

The only significant factor associated with K rise was the length of ICU stay before intubation

The factors associated with Kafter =/>6.5 mmol/L were:

- the length of ICU stay
- the presence of acute cerebral pathology.

The threshold of **16 days** was found highly predictive of acute hyperkalemia

Anesthesiology 2006; 104:158–69

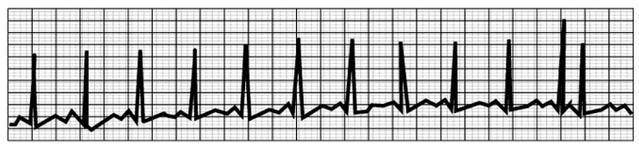
Succinylcholine-induced Hyperkalemia in Acquired Pathologic States

Etiologic Factors and Molecular Mechanisms

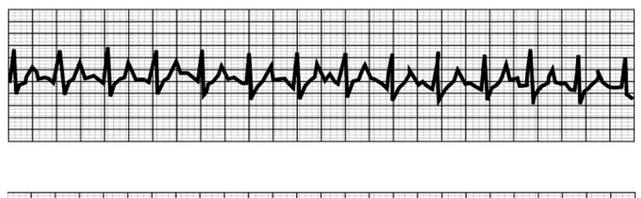
J. A. Jeevendra Martyn, M.D., F.R.C.A., F.C.C.M., Martina Richtsfeld, M.D.,†*

Arterial K^+ Time

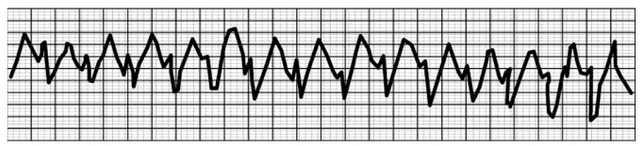
3.8 mMol/L Pre - SCh



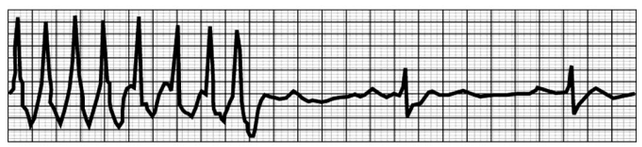
8.3 mMol/L 2 min after



9.2 mMol/L 5 min after



7.2 mMol/L 23 min after with defibrillation



4.2 mMol/L 24 min after

Defibrillation is **ineffective** in the presence of high potassium levels. High levels of **calcium** may revert this, and **repeat** doses may be required while monitoring the response to electrocardiography