

USCOM in the Operating Theatre – Clinical Case Study 2



The measure of life.

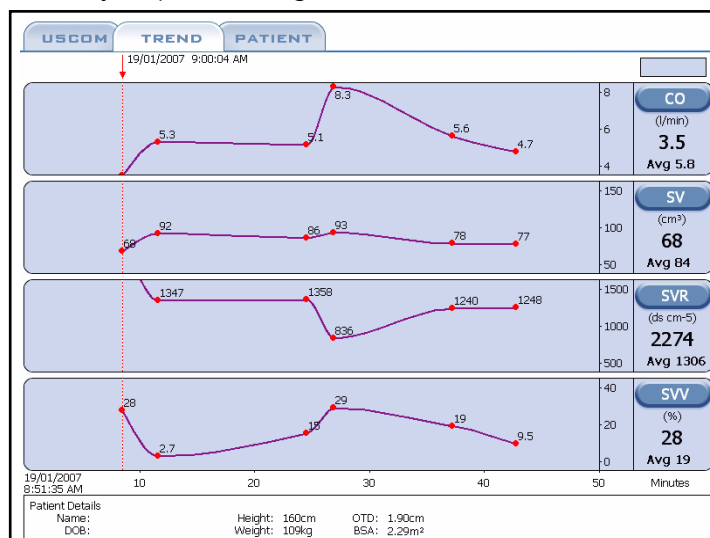
USCOM in the Operating Theatre

Obstetric Hypertension and Anaesthesia? Haemodynamic stability.

It is hardly surprising that major changes in the patient's haemodynamic status occur during surgery. Firstly, they may be on a host of medications for pre-existing. Patients may well have been given a bowel prep, which can cause significant loss of fluid from the body, as can pre-operative vomiting, pre-op fasting for many hours or even overnight. The anaesthetist will then use a plethora of drugs which have significant cardiovascular activity, ranging from myocardial depression to vasodilation. There may be blood loss or evaporative loss of fluid from the open abdomen, there may be antibiotics given intravenously which can have vascular activity, and as if all this wasn't enough, the anaesthetist may well use an epidural or spinal anaesthetic as well. What if the patient has pain, what will that do to their haemodynamics?

Whilst the measurement of blood pressure, heart rate and pulse oximetry are routine, do these really tell us much about the true haemodynamic picture?

A 24 year-old female with pregnancy-induced hypertension is undergoing caesarean section under a spinal anaesthetic. Due to the vasodilation which spinal anaesthesia produces, there can be marked falls in venous return with a consequent drop in stroke volume and cardiac output. The drop in venous return can lead to a fall in myocardial contractility as per Starling's Law.



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In this situation, should we give fluid or should we use a vasopressor? And if so, how then much?

Should we use a combination of the two? If we use an excessive dose of vasopressor, will this reduce the uterine blood flow with harmful effects on the baby?

About half-way through the case we see an abrupt fall in SVR and a sharp rise in cardiac output. Why was this?

In fact this followed the administration of 10 units of syntocinon i.v. Syntocinon causes uterine contraction which we want to occur just after delivery, but it can also produce marked vasodilation. This patient had sufficient cardiac reserve to maintain her blood pressure by increasing her cardiac output significantly, but what if she had pre-existing heart disease and was not able to do this? In this situation we could give the syntocinon in small increments while monitoring her cardiovascular responses. Simple!

Initially, following the vasodilation produced by the spinal block, the patient has a relative hypovolaemia, which shows as a high SWV. In response to rapid fluid administration, her SWV decreases to a more normal level. However, following the vasodilation produced by the syntocinon, we see an abrupt rise in SWV again indicating a relative hypovolaemia due to the vasodilation.

