**Title of Presentation:** Epidural Management for Emergency Cesarean Delivery: Where, When, and with What?

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**Learning Objectives:** (minimum of 2):

- Describe optimization of labour analgesia epidural catheters for emergent cesarean deliveries.
- Describe emergency cesarean categorization and how it can help make decisions.
- Describe the relationship between decision-to-delivery intervals and maternal and fetal outcomes.

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**Background:** Epidural analgesia for labour pain relief is very common and many of these patients need to come to the operating theatre for an emergency cesarean delivery. In most cases the in dwelling epidural catheter can be used to provide anaesthesia for the operation (using high dose local anaesthetic drugs) compared to analgesia (using low dose local anaesthetic / opioid mixtures), which had previously been provided during labour. The anaesthesiologist needs to communicate well with other members of the decision making team so that the urgency of the operation is understood. In the UK there are 4 grades of cesarean delivery with grade 1 being the most urgent (an immediate threat to the life or the mother or the baby) and grade 4 being done for purely elective reasons at a time to suit all members of the team.

The 30 min Decision to Delivery Interval (DDI) has historically been used as a standard for the delivery of the baby during a cesarean delivery. However there is poor evidence that it correlates with neonatal outcome and in some cases a short DDI can be detrimental to the health of the mother and her baby. More recent work relates to the Bradycardia to Delivery interval since the onset of fetal compromise / hypoxia does not start at the time a decision is made to deliver the baby, but the time bradycardia starts. It has been shown that in irreversible cases of fetal compromise (e.g. placental abruption, cord prolapse) an increasing BDI correlates with a decreasing fetal pH at delivery.

There are a variety of local anaesthetic drugs (and adjuvants) available which can be used to top up the epidural catheter, including 2% lidocaine with adrenaline and 0.75% ropivacaine. These drugs are often combined with opioids such as fentanyl or sufentanil. Lidocaine 2% with adrenaline according to a recent metaanalysis appears to provide the fastest onset of action whereas 0.75% ropivacaine is associated with the lowest incidence of intraoperative discomfort during cesarean delivery.

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**Major Teaching Points (minimum of 3):**

1. Epidural management for emergency cesarean delivery starts with good multidisciplinary communication.
2. The 30 min DDI is now regarded as an audit standard and there is evidence most caesarean deliveries can be performed within 75 min with the most urgent being performed in much less than 30 minutes. The BDI concept is currently being evaluated as a more sensitive tool to predict poor fetal outcome.
3. High concentration local anaesthetics and adjuvants should be used to provide anaesthesia using the indwelling epidural catheter.

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**Potential Clinical Implications:** a clear understanding of various aspects of anaesthetic management of caesarean delivery. Understanding the decision making processes which culminates in a cesarean delivery
Future Areas of Research (suggest at least 2):
- Can further drug adjuvants to local anaesthetic agents used to top up epidural catheters for cesarean delivery improve the speed of onset of the anaesthetic block and reduce the incidence of intraoperative pain.
- What is the ideal method of testing the anaesthesia block before cesarean delivery

Key References / Further Reading (no more than 10 – please see sample document for proper examples):
4. Thomas J et al. National cross sectional survey to determine whether the decision to delivery interval is critical in emergency caesarean section. BMJ 2004; 328 (7441): 665