

# TRANSFORMING THE EPIDURAL EXPERIENCE

*Patient care and safety in obstetric epidural analgesia*

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Labour pains can be some of the worst pains a woman may experience in her lifetime. At KK Women's and Children's Hospital (KKH), the Department of Women's Anaesthesia provides anaesthesia, critical care and pain management services for women. The department also specialises in obstetric anaesthesia, which includes providing epidural analgesia during labour, regional anaesthesia for caesarean delivery and critical care for high risk obstetric conditions.

The gold standard of pain relief during labour is the provision of epidural analgesia. This involves the infusion of pain-relieving drugs directly into the epidural space – the outermost part of the spinal canal – via a small catheter. Epidural analgesia provides effective pain relief with minimal or no sedation, allowing the mother to participate fully during the labour and delivery process.

## RESEARCH FINDS MOTHERS' TIMING IS BEST

At KKH, the majority of first-time mothers request for epidurals early in the labour process. Past studies have suggested that the timing of an epidural may affect the duration of labour, as well as the likelihood of needing a Caesarean section.

To better enable women to make informed choices on pain relief during childbirth, in 2014, the department led a research investigation into the timing of epidural administration, establishing that the right time to administer an epidural is when the patient requests for it.

Researchers from KKH, Duke-NUS Graduate Medical School, Singapore Clinical Research Institute and a medical student from NUS Yong Loo Lin School of Medicine, Singapore, collaborated on a

Cochrane systemic review comparing the effects of early and late epidurals during labour. The team reviewed data from nine studies involving 15,752 first-time mothers who were randomly assigned to 'early' or 'late' groups. During labour, those in the 'early' group were given epidurals when they were less than four to five centimetres dilated, while those in the 'late' group waited until they were four to five centimetres or more dilated.

The review found that those who had early epidurals were no more or less likely to need a Caesarean section than those who had late epidurals. Earlier epidurals also made no difference to the likelihood of needing an assisted birth involving forceps or suction, or to the amount of time spent in the second, 'pushing' stage of labour.

The findings of the review provide evidence-based assurance to mothers and healthcare providers that if the mother requests for epidural early in labour, this would not lead to adverse outcomes reported by some studies.

The medical evidence also supports guidelines by the American College of Obstetricians and Gynaecologists in 2006, which suggested that maternal request is a sufficient medical indication for pain relief during labour.

## PATIENT-CONTROLLED EPIDURAL WINS MATERNAL SATISFACTION

At KKH, patients in labour are also empowered with greater autonomy over their pain control, with the use of patient-controlled epidural analgesia (PCEA). This allows patients to self-administer additional pain medications into the epidural space at the press of a button, individualising the pain relief experience. The use of PCEA may also potentially result in fewer amounts of pain medications consumed during labour. Since 2012, nearly 90 percent of patients administered with PCEA have reported their labour epidural experience as excellent or good.

Innovative epidural delivery systems – such as the computer-integrated patient-controlled epidural analgesia (CI-PCEA), and automated mandatory bolus epidural administration techniques – have been investigated at KKH with promising results. The department is currently conducting a further clinical trial – Collaborative Outcomes with Labour Epidural Use Study (COLEUS) – to evaluate these systems' effectiveness in delivering an optimal pain relief experience. COLEUS is funded by National Medical Research Council, Singapore.



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## CARE FRAMEWORK STRENGTHENS MATERNAL SAFETY

The department provides round-the-clock pain relief support for birthing patients, and administers about 400 epidurals for labour and delivery pain each month. Epidural pain relief is maintained using low dose concentrations of local anaesthetics with opioids, to provide a high quality of analgesia with reduced motor blockade – the loss of motor function – in the lower body.

However, a small proportion of women who receive epidural analgesia for labour pain may still continue to experience residual motor blockade for some time after delivery. This can cause weakness in the lower limbs, and may lead to a risk of falls in the immediate postnatal period.

To reinforce patient safety and reduce the risk of falls after delivery, the hospital has in place a rigorous care framework to identify and monitor women at high risk of post-delivery residual motor blockade. This is implemented by a multidisciplinary team consisting of medical professionals from the department, and the hospital's Delivery Suite, obstetric wards and Acute Pain Service.

Key measures of the care framework include:

01

### ASSESS



Assessing patients for residual motor blockade immediately after delivery, using a modified Bromage scale, which reflects the level and extent of motor blockage.

02

### TRANSPORT



Transporting patients who are experiencing residual motor blockade via wheeled bed; these patients are not permitted to be transported by wheelchair, or walk, until their blockade has resolved.

03

### REGISTER



Registering patients on a dedicated observation chart, to alert nurses and reviewing anaesthetists to provide heightened monitoring and assessment for residual weakness and numbness.

Each month, seven to 13 women are identified to experience residual motor blockade for some time after delivery, and receive close monitoring via this care framework.

## EDUCATING FOR EXCELLENCE IN OBSTETRIC ANAESTHESIA

As the largest major obstetric anaesthesia teaching centre in Singapore, the department provides supervision and training for the SingHealth Anaesthesiology Residency Program (SHARP) and National Healthcare Group Residency Program. The hospital is a constant training ground for obstetric anaesthesia residents, who each undergo training for two to three months. To improve the interaction and communication between residents and faculty, debates and case-based discussions are also incorporated into the curriculum to hone residents' critical analysis and decision-making skills.

Placing patient safety as the highest priority, the department has developed training modules emphasising progressive competency in epidural analgesia, through epidural simulation training. Residents are assessed through competency-based learning and procedural skills tests under direct supervision by specialist faculty anaesthetists. This rigorous education helps to equip residents to advance the standards and possibilities of obstetric care into the future.

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Dr Sng Ban Leong's research interests include obstetric epidural analgesia, closed-loop systems, chronic post-surgical pain and the use of supraglottic airway for general anaesthesia in Caesarean section. He has received a National Medical Research Council (NMRC) Clinical Trials Grant for obstetric epidural delivery system research, NMRC Transition Award for chronic pain research and SingHealth Foundation Grant for vasopressor delivery system research.

In addition to his roles at KKH, Dr Sng is also Assistant Professor at Duke-NUS Graduate Medical School, and a Clinician-Scientist Mentor and Core Faculty for the SingHealth Anaesthesiology Residency Program.