

Repeated anesthesia can affect childrens ability to learn

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There is a link between repeated anaesthesia in children and memory impairment, though physical activity can help to form new cells that improve memory, reveals new research from the Sahlgrenska Academy at the University of Gothenburg, Sweden.

The study has been published in the *Journal of [Cerebral Blood Flow & Metabolism](#)*.

"Paediatric anaesthetists have long suspected that children who are anaesthetised repeatedly over the course of just a few years may suffer from impaired memory and learning," says Klas Blomgren, professor at the Queen Silvia Children's Hospital and researcher at the Sahlgrenska Academy. "This is a theory that is also supported by foreign research."

His research team discovered, by chance, a link between stem cell loss and repeated anaesthesia when working on another study. They wanted to find out what happens to the brain's stem cells when exposed to strong magnetic fields, for example during an MRI scan. The study was carried out using rats and mice, and showed that while the magnetic fields did not have any tangible effects on the animals, the repeated anaesthesia did.

"We found that repeated anaesthesia wiped out a large portion of the stem cells in the hippocampus, an area of the brain that is important for memory," says Blomgren. "The stem cells in the hippocampus can form new nerve and glial cells, and the formation of nerve cells is considered

important for our memory function."

Their results could also be linked to impaired memory in animals as they got older. The effect was evident only in young rats or mice that had been anaesthetised, not when adult animals were anaesthetised. This may be because stem cells are more sensitive in an immature brain, even though there are fewer of them as we get older.

"Despite extensive attempts, we have not been able to understand exactly what happens when the stem cells are wiped out," says Blomgren. "We couldn't see any signs of increased cell death, but are speculating that the stem cells lose their ability to divide."

Another treatment that wipes out the brain's stem cells is radiotherapy, which is used with cancer patients. Blomgren and his research team have previously used animal studies to show that [physical activity](#) after radiotherapy can result in a greater number of new stem cells and partly replace those that have been lost.

"What's more, the new nerve cells seem to work better in animals that exercise. Now that we know this, we can come up with treatments that prevent or reverse the loss of stem cells after repeated anaesthesia," says Blomgren, who believes that the findings will lead to greater awareness of the problems and inspire further research into the reasons for the loss of [stem cells](#).

[Anaesthesia](#) is the use of anaesthetics, which are administered to patients by inhalation and/or injection before a surgical procedure. Patients then fall asleep, relax their muscles and feel no pain whatsoever. Often a combination of several different drugs is given via a cannula. These take around 15-20 seconds to work, depending on when the anaesthetic reaches the brain.

Provided by University of Gothenburg

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