

# Small association of surgical anesthesia before age four, later academic performance

November 7 2016

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Credit: Lynn Greyling/public domain

A study of children born in Sweden suggests a small association between

exposure to anesthesia for surgery before the age 4 with slightly lower school grades at age 16 and slightly lower IQ scores at 18, according to an article published online by *JAMA Pediatrics*.

Pia Glatz, M.D., of the Karolinska Institutet, Stockholm, Sweden, and coauthors conducted a nationwide study of more than 2 million children born in Sweden from 1973 through 1993 by using a variety of [national health care](#) databases, school achievement registries, and the military conscription register.

The main study group included 33,514 children who had one [surgery](#) and exposure to anesthesia before the age of 4 and then no subsequent surgery or hospitalization until the age of 16, along with 159,619 comparable children who had not had surgery or been exposed to anesthesia before the age of 16. Another group of 3,640 children with multiple surgical procedures also was studied.

In the main study group, exposure to anesthesia for surgery before the age of 4 was associated with an average difference of 0.41 percent lower school grades and 0.97 percent lower IQ test scores. There was no difference in schools grades with one exposure to anesthesia for surgery before the age of 6 months, between 7 to 12 months, between 13 to 24 months or between 25 to 36 months, according to the results.

Among children with multiple surgical procedures before the age of 4, those with two exposures to anesthesia had 1.41 percent lower average school grades and those children with three or more anesthesia exposures had 1.82 percent lower average school grades, the authors report.

The authors note the study is unable to disentangle the potential effects of anesthesia, the influence of perioperative management, the influence of surgery or its underlying cause.

"While more vulnerable subgroups of children may exist, the low overall difference in academic performance after childhood exposure to surgery is reassuring. These findings should be interpreted in light of potential adverse effects of postponing surgery," the authors conclude.

**More information:** *JAMA Pediatr.* Published online November 7, 2016. [DOI: 10.1001/jamapediatrics.2016.3470](https://doi.org/10.1001/jamapediatrics.2016.3470)

Provided by The JAMA Network Journals

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