

major desaturation events (oxygen saturation measured by pulse oximetry $\leq 85\%$ for 30 s or longer) in 67 children with a higher incidence by a factor of 2 in those whose anesthesiologist did not have the oximeter data available. These studies suggested that the oximeter allowed early recognition and intervention, thus preventing a minor desaturation event from progressing to a major desaturation event.^{3,4} We also found a higher incidence of these major desaturation events in children younger than 2 yr. I do not know whether it is possible for Wilder *et al.* to go back and examine the anesthesia records from the 144 children in their cohort who had two or more anesthetic exposures to determine whether hypoxic events were recorded, but it might be a useful endeavor. I suggest that we need to look at other issues beyond simple exposure to anesthetic agents as possible contributory factors and look forward to more wonderful work from the Mayo group.

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The Elephant in the Room

To the Editor:—The conclusion reached by Wilder *et al.*¹ that exposure to multiple anesthetics is a significant risk factor in the development of learning difficulties is a headline-grabbing statement with far-reaching consequences for all providers of children's services. However, we believe there has been an insufficient attempt to draw attention to the elephant in the room: that children who require multiple operations usually have significant medical diagnoses, and/or syndromes with associated morbidities, that in turn are associated with a higher incidence of learning disorders than the general population has. Though this information on diagnoses is essential to interpret the data, it is only accessible on-line, and there is no information at all on the actual surgical procedures involved. Further analysis of the on-line data reveals that 22 of the 45 patients with multiple exposure to anesthesia have severe comorbidity or congenital anomalies that are frequently associated with learning difficulties. It should come as no surprise that children with cerebral palsy, Sturge-Weber syndrome, a history of meningitis, or cleft lip and palate have a higher incidence of learning difficulties than the general population.² Of the remaining 23 patients, 13 have serious otitis media. Even such isolated "minor" conditions are known to be associated with an increased incidence of educational delay.³

An attempt has been made to adjust statistically for neonatal factors but not for the effect of comorbidity. Though the inability to adjust for comorbidity is referred to in the text, we believe this omission is so significant that it invalidates any conclusion from this study. We are therefore afraid that this study does not contribute sensibly to the important discussion about potential anesthetic neurotoxicity in the immature human brain.

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"If the Odds Are a Million to One Against Something Occurring, Chances Are 50–50 It Will"*

To the Editor:—Given the potential ramifications of findings linking early anesthesia exposure to the later development of learning disabilities (LDs), we expectantly read the article by Wilder *et al.*¹ titled "Early Exposure to Anesthesia and Learning Disabilities in a Population-based Birth Cohort." This topic was not only of interest to the medical community, but also garnered significant attention from the lay media. However, despite the authors' interesting and thought-provoking conclusion that multiple anesthetic exposure in children before age 4 yr increased the risk of developing a subsequent LD, we caution against the overinterpretation of associations without investigation of potentially important medical, psychological, and psychosocial confounders.

For example, Wilder *et al.* used a less stringent, study-defined definition of LD, as opposed to that of the *Diagnostic and Statistical Manual of Mental Disorders* published by the American Psychiatric Association.^{1,2} Included in the *Diagnostic and Statistical Manual of Mental Disorders* criteria is the following caveat: "If a sensory deficit is present, the learning difficulties must be in excess of those usually associated with the deficit."² This *Diagnostic and Statistical Manual of Mental Disorders* provision to the diagnosis of an LD is particularly relevant to the authors' study, which included multiple children with known medical diagnoses associated with sensory deficits. Similarly, many of the patients in the study cohort who received multiple anesthetics and were subsequently diagnosed with a LD also had medical diagnoses that may have contributed to their low achievement and led

* —Anonymous.