attenuation factor probably underestimates the acoustic exposure in fluid-filled tissue.

A homogeneous tissue model with attenuation coefficient of 0.3 decibels/cm megahertz throughout the beam path is commonly used when estimating exposure levels. The model is conservative in that it overestimates the *in situ* acoustic exposure when the path between the transducer and site of interest is composed entirely of soft tissue. When the path contains significant amounts of fluid, as in many first- and second-trimester pregnancies scanned transabdominally, this mode may underestimate the *in situ* acoustic exposure. The amount of underestimate depends on each specific situation.[13]

So as, we gaze appreciatively at the "donut" surrounding the nerves, what is that increased exposure time doing on a cellular basis? We do not know. But the injection of fluid may alter tissue acoustic attenuation factors to more closely resemble *in vitro* conditions favorable to inertial cavitation, the effects of which increase with exposure time. The same product literature notes that we should structure the performance of studies to minimize exposure times.

In addition, bubbles represent an acoustical interface where energy release occurs. These bubbles may be iatrogenic or produced in the rarefaction phase of the acoustical wave.[14,15] Are practitioners assiduous about avoiding bubbles in the injected local anesthetic? What happens to a room-temperature, nondegassed liquid injected into a body-temperature subject? What of bubbles in a local anesthetic to which sodium bicarbonate has been added? Data show that bubbles decrease the cavitation threshold from 1.9-2.4 MPa to less than 0.65 MPa (filtered water data).[12] Product information for the SonoSite L38×/10-5 probe (SonoSite, Inc., Bothell, WA) shows an acoustical pressure of 2.345 MPa in the PW/Doppler mode or 2.89 MPa in the CPD mode. We have no information on the effect(s) of these potential sources of ultrasound cytotoxicity/neurotoxicity enhancement.

Ongoing studies in which thousands of ultrasound-assisted regional anesthetics have been performed without notable adverse effects are reassuring.[16] However, we remember other reports wherein the remarkable safety of spinals in tens of thousands of cases were discussed, and then a complication shows up; *i.e.*, transient neurologic symptoms. The flip side to those observations is that if effects do occur, such as those I have been discussing above, they are unusual events with high significance. Again, for those of us familiar with product development, one would want to specifically identify and mitigate just such occurrences through risk analysis. However, we have not performed or obtained that risk analysis for ultrasound-guided regional anesthesia.

In lieu of an outright moratorium on ultrasound-guided regional anesthesia, we must at least take reasonable precautions until additional research results are available: Limiting local anesthetic concentration to that necessary for achieving the desired result, limiting ultrasound exposure times, eliminating bubbles in injection solutions, not carbonating local anesthetics, warming local anesthetic solutions before use (degassing), and not spending time admiring the "donut." Until safety questions have been definitively answered, ultrasound-guided regional anesthesia deserves a continued high level of scrutiny.

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Green Breast Milk after Propofol Administration

To the Editor:—We would like to report an unusual observation of green breast milk after propofol administration. A 33-yr old woman underwent emergency laparoscopic removal of an ectopic pregnancy under general anesthesia with 474 mg propofol as a target-controlled infusion, fentanyl, remifentanil, mivacurium, and metamizole.

Preoperative medication included dimenhydrinate, metamizole, and piritramide, with additional metamizole, butylscopolamine, and metoclopramide postoperatively.

About 8 h after surgery, the patient reported that the first breast milk pumped showed a bluish green color, which changed to green during the course of the day, and which resolved 48 h postoperatively. Urine color was not monitored. Metabolites of phenoles like propofol (2, 6-diisopropylphenol) are a known cause of green urine.[1] The exact chromophoric compound responsible is not known. As propofol is also excreted into the breast milk,[2] it was suspected as a cause in this case.

A breast milk sample obtained 30 h after the initial color change was evaluated for possible propofol conjugated metabolite content. The sample was acid hydrolyzed, extracted with ethyl acetate, and analyzed by gas chromatography/mass spectroscopy, but there was no significant differ-

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ence in the free propofol concentration (24 ng/ml) as compared with an unhydrolyzed sample, and thus no evidence for conjugated propofol metabolites.[3] Metoclopramide, which can cause green urine,[4] could not be detected in the breast milk sample. Green breast milk is described after iron intake. Also, low casein and lactose content might cause green breast milk.[5]

In conclusion, a still unknown chromophoric substance, presumably derived from propofol, caused a green coloration of the breast milk in this patient. Risks to a nursed infant are unknown. The mechanism of propofol coloration of breast milk remains unknown.

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