Orthostetrics: Management of Orthopedic Conditions in the Pregnant Patient

To the Editor:
A recent article by Matthews et al1 offers information about managing orthopedic conditions in pregnant patients. Although several aspects of orthopedic care are discussed, it was the discussion of imaging and radiation exposure that gave me pause.

The authors state that diagnostic examinations rarely expose a fetus to doses above 50 mGy, and that at this dose, risk to the fetus is negligible. The authors go on to state that, “To further reduce fetal radiation exposure, careful shielding of the patient, including all sides of the abdomen and pelvis, is recommended for nonpelvic procedures,” citing the American College of Obstetricians and Gynecologists (ACOG) Committee Opinion Number 299, published in September 2004.2 However, on review of this document, there is no such recommendation. The only comment regarding shielding of a pregnant patient is that, “Commonly during pregnancy, the uterus is shielded for nonpelvic procedures.”

The authors’ statement not only misrepresents the opinion of the ACOG but also ignores the potential risks of shielding pregnant patients. First, all modern imaging systems (including mammography, radiography, fluoroscopy, and computed tomography [CT]) have automated exposure systems that help ensure adequate image quality. They work by increasing the amount of radiation used to image thick, attenuating tissues and using less radiation when imaging thinner, less attenuating tissues.3,4 Consequently, if an attenuating material enters the imaging field of view when automatic exposure control is being used, the system will adjust the amount of radiation to be able to “see through” the material, increasing radiation delivered to both mother and fetus.

A second risk is that relevant anatomy is obscured. If a CT chest study is ordered to rule out pulmonary embolism, and a lead apron is placed over the patient’s abdomen to help protect the fetus, there is a real concern that the apron will cover the lower portion of the lungs. The physician is now unable to fully evaluate the images for the presence of embolism. This may result in suboptimal image interpretation or the need to repeat the scan.

The discussion of shielding pregnant patients can be divided into 2 categories—examinations in which the fetus is inside the imaging field (eg, lumbar spine radiograph, pelvic CT) and examinations in which the fetus is outside the imaging field (eg, cervical spine, extremity, head CT). Clearly, shielding when the fetus is in the imaging field is counterproductive. When the fetus is outside the imaging field, most scattered radiation is absorbed by the mother before ever reaching the fetus. The radiation to which the fetus is exposed is internal scatter generated within the mother. External shielding will do nothing to limit the fetus’s exposure to internally scattered radiation.

The primary, and arguably only, reason for shielding pregnant patients is to provide peace of mind to them, and patient reassurance can certainly have significant value. However, it is important to recognize that shielding is not necessary for the well-being of the fetus, and that further, shielding a pregnant patient carries a risk of increasing the fetus’s radiation exposure.

Rebecca Marsh, PhD
Aurora, Colorado

The author has no relevant financial relationships to disclose.

REFERENCES

Reply:
We thank Dr Marsh for carefully reviewing a subject mentioned in our article on which she is clearly an expert. Critiques of this nature, in our opinion, strengthen the subject matter and add depth to publications.

After carefully reviewing ACOG Committee Opinion Number 299,1 we agree that it does not explicitly recommend shielding all sides of the abdomen and pelvis during nonpelvic procedures; however, it does state that this is a commonly performed practice. This is our general recommendation, as we do shield pregnant patients during nonpelvic orthopedic procedures, and does not represent the ACOG guidelines.
Dr Marsh also mentions a valid point affirmed in an American College of Radiology practice guideline that we cited—that shielding pregnant patients may help with their emotional well-being but not effectively alter the dose to the uterus. Again, shielding pregnant patients during nonpelvic surgical procedures is common practice at our institution. Perhaps further research on the utility of this practice is warranted.

Leslie J. Matthews, PharmD  
David B. McConda, MD  
Trapper A. J. Lalli, MD  
Scott D. Daffner, MD  
Morgantown, West Virginia

Drs Matthews, McConda, and Lalli have no relevant financial relationships to disclose. Dr Daffner is on the speaker’s bureau of DePuy-Synthes and holds stock in Amgen and Pfizer.

REFERENCES


doi: 10.3928/01477447-20151119-02