



## **Pregnancy Testing Prior to Anesthesia and Surgery**

**Committee of Origin: Quality Management and Departmental Administration**

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### Indications for Preoperative Pregnancy Screening:

Surgical indications for preoperative pregnancy screening should be based upon risk for fetal harm during, or subsequent to, the surgical procedure. Surgeries involving the uterus and uterine cavity and procedures disrupting uterine blood flow place the fetus at high-risk. Uterine surgeries include dilation and curettage, hysteroscopy, endometrial ablation, myomectomy, and hysterectomy. Surgeries disrupting uterine blood flow include procedures involving the heart and vascular system including the aorta, common iliac arteries, internal iliac arteries, uterine arteries, and ovarian arteries. Intra-abdominal laparoscopic procedures have indeterminate fetal risk.<sup>1</sup>

Additional consideration for preoperative screening should be made if the procedure is expected to expose a fetus to potential teratogens. These may take the form of x-rays or teratogenic medications.<sup>2</sup>

No currently used anesthetic agents have been shown to have any teratogenic effects in humans of any age when using standard clinical doses and duration.<sup>2</sup> The 2012 ASA Practice Advisory for Preanesthesia Evaluation concluded that the scientific literature is inadequate to inform patients or physicians on whether anesthesia causes harmful effects during pregnancy.<sup>3</sup> The current scientific literature is also inadequate to inform patients or physicians whether anesthesia may have adverse neurodevelopmental effects on the fetus during pregnancy.

The ASA Practice Advisory for Preanesthesia Evaluation recommended that pregnancy testing may be offered to female sex patients of childbearing age for whom the result would alter the patient's medical management.<sup>3</sup>

### Accuracy of Early Pregnancy Testing:

Early pregnancy testing is both highly sensitive and specific approximately 14 days post-conception. While false-negative and false-positive results do exist, they are relatively infrequent and can be ruled out through both clinical correlation and quantitative hCG. Implantation is required for serum hCG to rise, which takes place between six and 12 days after ovulation and fertilization. While blood pregnancy tests can be positive within 10 days following fertilization and ovulation, urine pregnancy tests can be positive 14 days following fertilization and ovulation. Sensitivity of urine  $\beta$ -hCG is >99% and specificity is 99.2%.<sup>4</sup> In the perioperative setting, detection of urine  $\beta$ -hCG >25 IU/L optimizes both sensitivity and specificity of test results. Detection below 25 IU/L lowers specificity by 10% while minimally reducing time between conception and testing.<sup>4</sup> Point-of-care urine  $\beta$ -hCG testing by nursing staff is accurately and easily performed.<sup>5</sup>

While home pregnancy tests frequently advertise >99% accuracy for detecting pregnancy on the first day of the missed menses, home pregnancy tests have large variation in the lower limit of detectable  $\beta$ -hCG (between 6.3 and 100 IU/L).<sup>6</sup> Additionally, there is variation in the specificity of home pregnancy tests.<sup>6</sup> As a result, home pregnancy tests cannot be recommended as a



substitute for hospital point-of-care testing. False positive results are relatively uncommon and false negative results are also relatively uncommon once a pregnancy is established. Sporadic reports appear in the literature of home pregnancy tests displaying positive results when exposed to urine not containing  $\beta$ -hCG. In other cases, tumors can secrete compounds similar to  $\beta$ -hCG, resulting in positive tests.<sup>6</sup> Finally, individual variation in the presence of  $\beta$ -hCG forms can result in false negative tests.<sup>7</sup>

#### Medicolegal Concerns:

Medicolegal risks of failing to detect early pregnancy prior to anesthesia are very small for anesthesiologists. Out of a database of over 10,500 claims in the Anesthesia Closed Claims database, there are only 7 claims in which undiagnosed pregnancy was an issue.<sup>8</sup> These included 3 claims for miscarriage in which a pregnancy test was not performed, including one planned hysterectomy where the gynecologist failed to preoperatively diagnose the pregnancy. A payment was made on behalf of the anesthesia team and the gynecologist in this claim, but not in the other 2 claims with non-gynecologic surgery. A pregnancy test was performed prior to anesthesia/surgery in 4 claims for fetal loss, but the anesthesiologist failed to check the results preoperatively. These claims resulted in payment on behalf of the anesthesiologist in 3 out of 4 cases. Hence, other than for surgical indications, routine pregnancy testing may pose greater medicolegal risk to anesthesiologists due to failure to check the result or failure to document informed consent of risk of miscarriage prior to elective surgery.

#### Ethical Considerations:

There are many ethical issues for routine pregnancy screening.<sup>9</sup> The patient has the right to decide to have pregnancy screening prior to receiving an anesthetic. Coercing a patient into having a pregnancy test against their wishes violates patient autonomy.<sup>9</sup> Informed consent for pre-procedure pregnancy testing should be obtained to respect a patient's self-determination (autonomy) of decision making. Informing the patient of the risks, benefits, and alternatives related to preoperative pregnancy testing including false positive and false negative pregnancy test results serves to support the ethical principles promoting the patient's best interests (beneficence) and avoiding harm (nonmaleficence). Ideally, preoperative educational resources regarding testing should be provided to patients prior to scheduling a procedure/surgery to allow patients to make an informed decision. A patient's privacy should be respected and therefore physicians or institutional representatives should clarify with the patient, to whom in addition to the patient, the pregnancy test result can or must be revealed. Institutions should have a policy in place to clarify how and by whom the patient is informed of a positive pregnancy test. Institutions should establish a process to provide counseling and prenatal care for those patient populations in need of support. At risk groups, including minors, institutionalized patients, or patients who do not have decision-making capability, or patients in a situation where they are not able to express their wishes and values, should receive special consideration, which may involve medical consultation, ethics review, and legal counsel.

In addition to the above recommendations, policies for preoperative pregnancy screening of minors prior to elective diagnostic and therapeutic procedures should recognize the serious, sensitive and unique implications of testing in this subgroup of patients.<sup>10,11</sup> Informed consent or assent should be attempted and ideally obtained from the adolescent patient with provisions for as much confidentiality and trust as possible between the patient and care providers. Also, recognize that in some states the patient could attain the status of a medically emancipated minor once confirmed



as pregnant and their rights may include the decision to disclose or withhold positive results from parents or guardians. Institutions' policies regarding pregnancy testing and notification of minors should be consistent with applicable state regulatory or statutory authority.

Anesthesiologists and surgeons/proceduralists should be able to recuse themselves without question or repercussion from an elective case if their values/beliefs are in conflict with provision of care. The physician should refer the patient to an alternative healthcare provider in a timely manner.

#### Recommendations:

1. Pregnancy testing may be offered to female sex patients of childbearing age and for whom the result would alter the patient's management, but testing should not be mandatory. Informed consent or assent of the risks, benefits, and alternatives related to preoperative pregnancy testing should ideally be obtained. Best practice may employ shared decision-making between patients and providers.
2. In facilities where an informed consent process is adopted as policy, local policy development should also consider any associated documentation requirements.
3. Preanesthetic educational materials should ideally be developed and given to patients to allow them to make an informed decision. This material should include information about false positives and negatives of pregnancy testing and that the scientific literature is inadequate to inform patients or physicians on whether exposure to anesthesia causes unknown harmful effects during early pregnancy.

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