



# Screening and Testing for Pregnancy in Adolescents Undergoing Radiologic Procedures—Why, How, and When?



■ Lorie Reilly, MSN, CRNP, CPNP-AC; and Eve Bosnick, MSN, APRN, PNP-BC

**ABSTRACT:** Adolescents are a subset of patients with unique developmental and behavioral risks that present a challenge to radiology staff in determining risk of pregnancy when performing procedures using ionizing radiation. This article presents information to guide thinking and help develop policies for screening and testing. A review of the current guidelines by the American College of Radiology is applied to a case study to illustrate the why, how, and when of pregnancy screening and/or testing in adolescents undergoing radiologic procedures. (*J Radiol Nurs* 2016;35:111-118.)

**KEYWORDS:** Pregnancy testing; Radiation exposure; Teen pregnancy; Pregnancy screening.

## INTRODUCTION

The average age of menses among adolescents in the United States is approximately 12.43 years (Pitts & Gordon, 2011), and a significant number of adolescents in this age group have had sexual intercourse and are at risk for pregnancy (Cox, 2011; Kann et al., 2014). General practice guidelines for screening and testing for pregnancy for females of reproductive age undergoing procedures that involve ionizing radiation may not

take into account these unique aspects of adolescent development and behavior. Screening policies and procedures for teens, as opposed to adult females, should demonstrate an understanding of the physiology of puberty and potential fertility of teens, as well as, developmental and behavioral risks.

Adolescents age 12 years and above (as well as those younger who have had their first menses) should be screened for pregnancy to minimize the risk of harm of radiation exposure associated with a potential pregnancy. Technologists, nurses, and physicians should not assume that they are not pregnant, and pregnancy status should be verified before proceeding with a radiologic examination or procedure.

## CASE STUDY PART A

A 13-year 4-month-old female comes to your radiology suite with a chief complaint of abdominal pain. She has been referred for a computed tomography (CT) scan of the abdomen and pelvis for a complaint of persistent lower abdominal pain, nausea, and vomiting. Her mother states that her daughter started her menses approximately 5 months ago but they have been irregular. They believe that her last menses was 5 weeks ago. Mom is asked by the radiology technologist/nurse to leave the room briefly for a confidential screen and

Lorie Reilly, MSN, CRNP, CPNP-AC, Nurse Practitioner, Department of Sedation, Radiology and Vascular Access Nursing, The Children's Hospital of Philadelphia and Advanced Senior Lecturer, Pediatric Acute Care Nurse Practitioner Program, University of Pennsylvania School of Nursing, Philadelphia, PA; Eve Bosnick, MSN, APRN, PNP-BC, Director, Adolescent Health and Wellness Center, Advocate Mainline Pediatrics; Nurse Practitioner, Covenant House of Pennsylvania, and Teaching Faculty, Lecturer, Primary Care Pediatric Nurse Practitioner Program, University of Pennsylvania School of Nursing, Philadelphia, PA.

Corresponding author: Lorie Reilly, The Children's Hospital of Philadelphia, Department of Sedation, Radiology and Vascular Access Nursing, University of Pennsylvania School of Nursing, 302 Keatley Drive, Mount Laurel, NJ 08054. E-mail: [reillyl@email.chop.edu](mailto:reillyl@email.chop.edu)

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the patient denies risk of pregnancy or onset of sexual activity.

The case study previously mentioned will illustrate the why, how, and when of screening and testing for pregnancy in an adolescent undergoing radiology procedures.

### **Discussion of Case Study Part A**

The scenario describes a typical patient that could present to the radiology department. Preteens and adolescents account for a small but increasing number of patients who require diagnostic imaging using CT and other medical imaging where there exists potential radiologic risk to a developing embryo or fetus (Larson, Johnson, Schnell, Salisbury, and Forman, 2011). Approximately, 5-9 million CT examinations are performed annually on children in the United States (The National Cancer Institute, 2012). The use of CT in children is estimated to rise at about 10 percent annually due to increased ease of use and availability (The National Cancer Institute, 2012). Pregnancy screening policies of institutions and facilities that care for potentially pregnant teens should extend to all procedures which could be considered a risk to the developing fetus. These include radiologic procedures, fluoroscopy, procedures with anesthesia, surgical procedures, and pharmaceutical therapeutics.

Although Donaldson, Napier, Ward-Jones, Wheeler, and Spargo (2012) noted a low incidence of previously unrecognized pregnancy in pediatric patients undergoing anesthesia, it is still important to identify pregnancy status in advance of any procedure that may result in unintended harm to the fetus. The International Commission of Radiology recommends screening for pregnancy in for all women of child-bearing age due to the cumulative impact of radiologic procedures and the potential teratogenicity (Dauer et al., 2012). Glotz de lima et al. (2013) found that 3.9 per 1,000 women had previously unknown pregnancies that would have been undetected before cardioablation or electrophysiologic studies. Urine pregnancy testing should be offered to all female pediatric patients who have reached menarche before undergoing general anesthesia (Donaldson et al., 2012), but this is not always the practice in all health care settings. Goyal et al. (2013) stressed that the diagnosis or exclusion of pregnancy is critical to the clinical assessment of adolescent females (aged 14-21 years) yet noted overall low rates of pregnancy testing in emergency rooms, particularly for patients who present with reproductive health-related symptoms needing to undergo radiologic imaging.

This highlights the need for increased awareness of screening and testing for pregnancy in all settings where

procedures may be performed that pose a risk to a fetus. For example, a single chest x-ray produces less fetal exposure than a CT scan of the abdomen and spine (see Table 1).

Screening for pregnancy in adolescent females undergoing radiologic procedures as opposed to adult females is a complex topic that requires understanding of menstrual physiology and puberty; knowledge of risk of pregnancy in teens; pregnancy screening and testing procedures; knowledge of consent and confidentiality requirements; risk of radiation exposure to the fetus; skills at communication with teens and families; and coordination and training of radiology technologists, nurses, physicians, and office staff to provide safe care.

### **Overview of Menarche and Puberty**

For young females, menstruation and ovulation can take a long time to develop regular, predictable cycles (Pitts & Gordon, 2011). Because of inconsistent pulsatile gonadotropins (ie, follicular stimulating hormone and luteinizing hormone), ovulation can occur at any time and is often heralded by menarche (Pitts & Gordon, 2011). Although many newly menarchal females are not fully ovulatory, and therefore not at risk of pregnancy, there still remains the potential for ovulation at the onset of and potentially before menarche in certain females (Pitts & Gordon, 2011). Because the cycle can take up to 2 years to fully regulate, the last menstrual period may not be reliable data for or against the risk of pregnancy early in female development (Pitts & Gordon, 2011). In addition, many young teens are poor historians with regard to the date of onset of their last menstrual period (Cox, 2008).

Health care staff can improve a young patient's ability to remember their last menstrual period by looking at a calendar together and identifying important activities such as holidays or family vacations which can help the patient place the first day of their last menses. Still, many young females do not monitor or document their menses carefully enough to make this information reliable (Daley, Sadler, and Reynolds, 2013; Emans, 2011; Cox, 2008).

### **Earlier Development of Secondary Sex Characteristics and Sexual Risk Taking**

Young females may have developed secondary sex characteristics, breasts and pubic hair before the onset of menarche (Pitts & Gordon, 2011). The average age for the onset of secondary sex characteristics has decreased in females in the United States, likely due to an increase in fat cell production of estrogen so that females as young as age 8 years may have already begun breast development and are considered normal

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