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Chapter 9

PREGNANCY AND ABORTION

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The role of caring for a pregnant adolescent can be rewarding, but it also possess unique challenges. A significant number of adolescent pregnancies are unintended and therefore providing comprehensive counseling is important even before the initiation of sexual activity. By understanding the risk factors the patient may further be provided delivery of appropriate health prevention/promotion services. It is also important for the health provider to continue to be an integral part of the life of the teenager and her child for an optimal development and growth.

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INTRODUCTION

Pregnancy among adolescents across the world and specifically in the United States continues to be a significant public health concern. The United States leads the developed world in adolescent birth rates with over 750,000 US adolescents (aged 15-19) becoming pregnant each year (1)(see figure 1).

Figure 1. US teenagers have higher pregnancy rates, birthrates and abortion rates than adolescents in other developed countries.

Fortunately, in the last decade there has been a decline in teen pregnancy. There are multiple reasons for this decline based on data from the Alan Guttmacher Institute. First, there has been a change in the behavior of sexually experienced teens. Second, in the past two decades, there has been an increase in the percentage of sexually experienced teens who report using a method of contraception at their first sex (2). The reason for the most impact on this decline is that the overall contraception use has not only increased, but more effective methods are available and being utilized. For example, the injectable contraceptive (Depo-Provera™) and the contraceptive implant (Norplant™) were
introduced in the early 1990s (3). The Food and Drug Administration (FDA) in 2006 has approved progesterone-only implant called (Implanon™). These methods have improved the teenager's compliance by removing the responsibility of a daily medication.

Despite this decline, as of 2004, 41.2% of all pregnancies were in adolescents 15 to 19 years of age (4). In the United States 22% of women report giving birth before age 20 years. Compared to other developed countries, Great Britain reports 15%, Canada 11 %, and France 6% (5). Despite the higher incidence of adolescent pregnancy in the United States, the sexual activity of teens and the age of onset of first sexual intercourse is consistent across developed countries. In the United States, levels of reported sexual intercourse by adolescents decreased during the 1990s for both sexes after an increase in the previous two decades (6,7). Despite this, a study that was initiated between 1998 and 2001 to investigate adolescent sexuality, found that sexually active teens in the United Stares were less likely to use any contraceptive method and especially less likely to use highly effective hormonal methods than their peers in other developed countries (3).

**DIAGNOSIS OF PREGNANCY**

The diagnosis of pregnancy can be made by utilizing these three diagnostic tools. a) History and physical exam b) Hormonal assays and c) Radiology-Ultrasound.

**History and physical exam**

The history taking involves a complete account of the menstrual history, last menstrual period, contraceptive use, and vaginal bleeding. Other notable signs and symptoms that occur during the first trimester include amenorrhea, breast changes, possible nausea and vomiting. In cases of an ectopic pregnancy, abdominal pain may be a presenting symptom.

On physical exam, changes in the uterus, cervix, and breasts should be noted. Initial signs include softening and elongation of cervix (Hegar sign), which is seen at about six weeks of gestation and an enlarged
uterus on bimanual exam (around 12 weeks). There is venous congestion of the cervix at around 12 weeks resulting in its bluish discoloration (Chadwick sign) (8).

**Hormonal assays**

Various hormones (e.g. Pregnancy-specific beta-1 glycoprotein, Placental Protein 5) are secreted by the cytotrophoblast and syncytiotrophoblast. However, measuring the levels of these hormones may not be economically and commercially feasible. The most common hormone used to detect pregnancy is Beta-human chorionic gonadotropin (β-hCG). This hormone is detected in the urine and serum, 8 to 10 days after conception and implantation of the embryo and syncytiotrophoblast. The sensitivity of this assay in urine in most pregnancy test kits is 25 mIU/ml. In the serum β-hCG can be detected in concentration as low as 5 mIU/ml (9). Care must be taken to interpret accurately the false positive β-hCG test results. Serum progesterone level is another assay (after a positive β-hCG) that can be helpful in testing ectopic pregnancy and spontaneous abortion. The level of this hormone is generally greater than 25 ng/ml in a viable intra-uterine pregnancy. However in cases of a nonviable pregnancy the level falls less than 5 ng/ml. Early Pregnancy Factor (EPF) is the earliest marker (after fertilization) that is detectable in less than 48 hours of conception (10). This assay currently has limited use clinically but may be a very useful test in the future.

**Radiology**

Transvaginal ultrasound (TYUS) can detect an intrauterine pregnancy much earlier than the traditional Transabdominal ultrasound (TAUS). TVUS is also better in obese women and can be done in patients who don't have a full urinary bladder that is needed for the TAUS. A gestational sac can be detected by a TYUS at around 4 to 5 weeks into gestation. Some clinicians correlate the US results with the quantitative hCG level, also known as discriminatory level. For e.g. GS may be noted.
with a hCG level as low as 300 mIU/ml and has a discriminatory level of 3,600 mIU/ml.

**FACTORS AFFECTING TEEN PREGNANCY**

Although, the sexual activity among teenagers has decreased recently, younger teens continue to be at an increased risk for non-consensual sex (11). As much as 47 percent of high school teenagers have already had sexual intercourse and 14 percent of them have had four or more sexual partners. A third of the sexually active high school teenagers failed to use condoms during their last intercourse (12). Half of the teen pregnancies happen within six months of initiation of sexual intercourse (11). In the last few decades, teen pregnancy rates have steadily decreased overtime due to legalization of abortion and effective contraception methods (13). However there was a three percent increase in pregnancy rate among 15 to 19 year per 1,000 females in 2006 (14). Several factors have been indicted in teen pregnancy. Early sexual activity is often cited as a predominant factor in teenage pregnancy. Early puberty, poverty, substance use, poor school performance and dropouts, lack of career goals, parental inattention toward teens, and past history of being sexually abused are few reasons that may lead to early sexual activity (11).

**AFTER THE DIAGNOSIS: THE NEXT STEP**

Once the diagnosis has been made, the next step is to inform the patient in a quiet and confidential setting. This information should not be shared with others, unless the clinician is concerned about the patient’s safety and or the safety of others. It is important to be sensitive to the patient’s cultural, social, religious and family values that may influence her reaction as well as her options for the pregnancy. While assessing the patient’s reaction, the clinician needs to make sure that the patient understands her diagnosis.
Furthermore, determining if the patient had been or is being sexually, emotionally or physically abused needs to be discussed at time of diagnosis of pregnancy. Incest may be a reason for the pregnancy. A study consisting of 535 young women (ninety-three percent of the sample was 17 years or younger at first pregnancy) found that 66% of the women were victims of sexual abuse and 62% were sexually abused prior to their first pregnancy (15). In these cases, as well as in cases of developmentally delayed children or adolescents a report must be made to appropriate authorities.

In the initial discussion with the patient, be aware of state laws regarding consent of a minor to prenatal care. As of April, 2008, there are 35 states and the District of Colombia that allow some minors to consent to prenatal care. Included are 28 states that allows all minors to consent to prenatal care; four states require a minor to be of a specific age to consent to prenatal care and three scares allow a minor who is considered mature enough to understand the nature and consequences of treatment to consent to prenatal care. There are 15 states without an explicit policy on the consent of minors for prenatal care (16).

**Dating the pregnancy**

At the initial visit, it is important to date the pregnancy as accurately as possible, because this information is useful when discussing the patient's options. The gestational age is usually calculated using the Naeglele's rule: To the first day of the last menstrual period (LMP), add 7 days, subtract 3 months, and add 1 year to obtain the expected date of delivery (17). Using the menstrual cycle may not be accurate in patients who are uncertain of their LMP, or have an irregular menstrual cycle. In these cases sonography is an appropriate method for pregnancy dating (18).

**Medical and psychosocial history**

The immediate goals of this visit are to identify any potential complications which would require immediate attention. To identify these risk factors it is necessary to review the patient's medical, sexual,
family and social history. Obtain a detailed medical history including chronic medical conditions, surgeries, and any medications including prescription, over the counter and alternative medications the patient has taken in the past or is currently taking. The provider should also obtain a clear sexual history, as there may be risk factors that would warrant testing for sexually transmitted infections. Family history should also be reviewed focusing on obstetric and gynecological problems, bleeding disorders, and congenital abnormalities. Finally, reviewing the social history of the patient will provide an overview of the level of support the patient may have. Also discuss illicit drug, tobacco, and alcohol use in both the past and the present. Although the patient may not abuse substances at the time of diagnosis, this may have served as a coping mechanism and thus put her at risk for future use.

**Counseling**

Having the time necessary to spend with the patient may be difficult in a busy clinical setting, but it is important to address some issues at the time she receives the diagnosis. It may be appropriate to refer her to a social service agency to receive further help. Establishing rapport is always essential when beginning to counsel an adolescent. This is extremely necessary when the adolescent is receiving the information that she is pregnant. The patient and/or parent or caregiver may have suspected the pregnancy, which may have prompted the office visit; however it is important to deliver the diagnosis to the adolescent in the absence of others.

The majority of adolescent pregnancies are described as "unintended". More than 75% of teen pregnancies are considered unplanned or unintended and 35% end in abortion. For those that continue with the pregnancy, 40-60% of births are considered to be the result of unintended pregnancies (19).

The patient’s reaction to the pregnancy can vary from anger to guilt to denial, and there are many other emotional reactions as well. She may want the baby and display excitement, but for varying reasons. From an idealistic perspective, she may view the child as an achievement without fully comprehending the responsibility. Often, the baby may represent
someone to love and to receive love. She may experience fear of reactions from parents, friends and the father of the baby. Fear of societal judgment can often be a common reaction. Furthermore, she may have fear of the future: pregnancy, delivery, and caring for the child. Finally, some adolescents may believe the pregnancy will serve as a commitment by the father of the baby (20). Giving her time to express her reaction allows her to explore these emotions and will aid the clinician in further understanding her social situation.

It is imperative to keep the patient's safety in mind. The person performing the counseling should ask her how she believes her family, caregiver, and father of the baby will react to the news. Does she feel at risk or in danger of reaction? Most teens greatly fear sharing the news with loved ones and generally anticipate negative reactions. She may find it reassuring that while most families and caregivers may be initially surprised, angry or disappointed, overall, the majority then show emotional support. It is important to strongly recommend that she share the news with persons she cares for as they may serve as her support system. Also, inquire about the beliefs and attitudes of the people toward teen pregnancy that she intends to share the news with.

The final step in discussion is to address the patient's options. She may or may not be ready to discuss her options and based on her personal beliefs, this could be a very short discussion. Again, it is important to be aware of one's own beliefs and if it is difficult to counsel the patient in an objective manner, and referring her to a place of nonbiased support is the most appropriate action.

The American Academy of Pediatrics reviewed and endorsed principles initially published in 1989 regarding counseling an adolescent about pregnancy options. The policy is for the pediatrician to give the adolescent other concerned persons information on all available options to help the adolescent make an informed decision. The options available to the adolescent usually include carrying her pregnancy to delivery and raising the baby, carrying her pregnancy to delivery and placing the baby for adoption or terminating her pregnancy (21). You should advise the adolescent that it is important to take some time to consider her options. It may be very helpful to schedule more clinic visits to allow her to fully evaluate her options and ask questions.
However, it is also important to discuss that a decision does need to be made in a timely manner not only for a termination decision, but also delaying prenatal care can have poorer outcomes for the baby. Furthermore, avoiding the decision making will only reduce her options. Be familiar with financial and social community resources for referral purposes. Financial resources are often available not only if she chooses to continue the pregnancy, but also if she chooses termination. Being familiar with legal aspects of her options is also an important discussion.

Many states in the United States have varying degrees of parental involvement required in a minor's decision to terminate a pregnancy and other countries may have different rules and laws, so important that you as a pediatrician be aware of the local legal aspects. Thirty-five states require some parental involvement in a minor's decision to have an abortion. Of those 35 states, 22 states require parental consult only and two of those states require consent of both parents; 11 states require parental notification only and one state requires both parents to be notified. Of the 35 states, all have an alternative process for minors seeking abortion. A judicial bypass procedure exists to allow the minor to bypass parental involvement and obtain approval from a court for termination of a pregnancy. Six states also permit a minor to obtain an abortion, if a grandparent or other adult relative is involved in the decision.

Finally, most states that require parental involvement make exceptions to these laws under specific circumstances. Twenty-nine states permit a minor to obtain an abortion in a medical emergency and 14 states allow a minor to obtain an abortion in cases of abuse, sexual assault, incest or neglect (22).

**Continuing the pregnancy**

If the patient has made the decision to continue with the pregnancy, referring her to a comprehensive multidisciplinary service specifically for adolescents should be the optimal place for her to receive medical, psychosocial, and nutritional care (23). An appointment should be made within one to two weeks. Encourage her to identify someone who is a caring supportive adult, and who can accompany her to her visits. She
may have anxiety surrounding this appointment and a phone prior to the visit as well as after may provide support. Often, when patients are pregnant they transfer care to their obstetrician and may not visit their primary care physician during the pregnancy. However, specifically in the teen population, keeping contact with your patient will provide support to her as well as make the transition back to your clinic smoother once she has given birth.

**ADOPTION**

Adoption is not a common choice for adolescents to make when discussing pregnancy options. In the United States only 5% of those who give birth allow their babies to be adopted (24). The low rate of adoption among this population has not always been the trend. In the 1950's, 95% of pregnant teenagers chose adoption, compared to 14% in 1971, and since the 1980s it has remained steady at 5%. This decrease in adoption is thought to be due to a decrease in the public perception or stigma of teen pregnancy and the greater acceptability of being a single parent (25). Some of the barriers to choosing adoption include the lack of the professional discussing this option. The absence of adoption dialogue may also be due to lack of knowledge by the professional offering counseling. Furthermore, a teen may be reluctant to choose this option because she is worried about the psychological stress of infant as well as the feeling of self-abandonment (24). Finally, there is often a misperception or lack of knowledge of the adoption process leaving the adolescent less likely to consider adoption (26).

Because of these barriers, it is important for the health provider to be educated on the adoption process and refer to a social agency if there are any questions that cannot be answered. When considering the options, the adolescent's choice is most influenced by the mother of the teen and the male partner. Prior to pregnancy, the closest friend of the adolescent was more influential on decisions compared to the mother (25). The most common characteristic of those who choose adoption are the teens whose parents favor adoption and/or have a few parenting peer models (27).

Indeed it is important to be familiar with the types of adoption that exist, the terminology that surrounds the adoption process and the legal
process that occurs. Finally, although the practitioner may not be able to fully answer questions that the patient may have, being familiar with the local resources will enable her to obtain this information.


**TERMINATION OF PREGNANCY**

Abortion is a worldwide public health concern. The World Health Organization has reported that 53 million unplanned pregnancies result in artificial termination each year (28). It is estimated that one third of all abortions are performed under unsafe conditions leading to 13% of all maternal deaths (29). In the United States, 4 out of 5 teenage pregnancies are unintended and about one-third of all adolescent pregnancies end in induced abortion. Abortion rates have declined steadily among young and older adolescents of all races in the United States since 1990 (30).

A possible explanation for this decline is that adolescent pregnancy and birth rates have also declined. This may be attributed to increased contraceptive use by adolescents (see figure 1) (31).

Most abortions occur during the first 8 weeks of gestation. Not only do abortions have a higher medical risk later in the pregnancy, but also, an earlier abortion is less stigmatized both socially and legally. The timing of when the abortion occurs differs somewhat for adolescents. Compared to adults, adolescent women and African American teens are more likely to have late abortions. There are many reasons for teens delaying pregnancy termination in comparison with adult women. Adolescents do not recognize the signs and symptoms of pregnancy and often do not consider pregnancy as a reason for amenorrhea. This is especially true if they have a previous history of irregular menstrual cycles (32). Because of the delay in the diagnosis of pregnancy, if termination of the pregnancy is the decision, this is often further delayed. Furthermore, obtaining an abortion may require traveling significant distances as 80 percent of counties in the United States do not have an abortion provider. Financial barriers may certainly affect adolescents seeking abortions. In most states, abortion is not covered by state Medicaid programs (16).

If the patient has made the decision for termination of the pregnancy, there are steps that need to be taken. Of course, confirmation of the
pregnancy is important using either serum or urine hCG test. A physical exam and ultrasonography should be performed to estimate gestational age. Options for approaches to termination may be limited depending on the gestational age. Screening should be completed for sexually transmitted infections including Chlamydia trachomatis and Neisseria gonorrhea. HIV testing should be offered. Further laboratory evaluation should include Rhesus status, urinalysis and a complete blood count. All Rh negative women should receive immune globulin at the time of the abortion to prevent possible sensitization and resulting in erythroblastosis fetalis with future pregnancies. Finally it is imperative that pre-abortion counseling takes place. Inquire about the decision-making process that brought her to this conclusion. Ask if anyone was a part of this process and who she considers a support. A follow-up phone call following the procedure will provide her with reassurance and an opportunity to discuss feelings she may have. A contraception plan must also be in place prior to the abortion as well as a discussion on protection against sexually transmitted infections.

**Approaches to termination of pregnancy**

There are medical and surgical methods for termination of pregnancy. Medical termination refers to the uses of Prostaglandins and/or Mifepristone, and Methotrexate with Prostaglandins. The option of medical abortion has a lower rate of success than surgical abortion. It is a safe option, but does require the access to a specialized center should heavy bleeding occur and further care needs to be available. Although it does require more office visits many women choose this option. In a study from the United Kingdom, the most frequent reason for choosing the medical method was to avoid aspects associated with the surgical option, mainly the anesthetic (61%). Furthermore, 32 percent of women chose it for the process being simpler and natural. Those who chose the surgical procedure generally wanted to avoid the awareness and involvement in the process of termination (49%) and were concerned about the pain (16%) or emotional impact (14%) of the medical termination (33).
The most typical regimen for medication abortion includes Mifepristone followed by Misoprostol, which was approved by the Food and Drug Administration (FDA) for abortion in 2001. Mifepristone is a potent progesterone antagonist, which leads to decidual necrosis and detachment of the trophoblast. Misoprostol is a synthetic prostaglandin E1 analog, which causes uterine contractions, cervical softening, and expulsion of the products of conception. Methotrexate, an antimetabolite, can also be used in conjunction with Misoprostol. The FDA approved protocol (there are multiple other well published protocols) can be initiated at less than 49 days of gestation and requires three office visits by the patient: administration of oral Mifepristone, followed 48 hours later by oral Misoprostol in the health care provider's office, and then a follow-up appointment in 14 days.

Side effects of medical methods are moderate to heavy bleeding, pain, nausea, vomiting and diarrhea. These side effects can vary depending on the protocol and gestational age (34). The mean duration of vaginal bleeding (estimated from the time of the last dose of Misoprostol) ranges from 10 to 17 days (7). In cases in which Misoprostol failed to terminate pregnancy, congenital abnormalities in the infants including scalp or skull defects, cranial-nerve palsies, and limb defects such as talipes equinovarus, have been reported (35). Methotrexate can have a cytotoxic effect on the fetus including limb defects. Because of this, careful follow up with vaginal ultrasonography is mandatory (36). Medical termination of pregnancy is considered successful if complete expulsion of the products of conception occurs without the need for surgical intervention. It is not recommended after nine weeks of gestation due to the high incidence of failure and uterine bleeding (37). It is important to counsel the adolescent that if this method is chosen, she needs to plan in a safe and private environment following the ingestion of an abortifacient agent for the expulsion of the products of contraception.

Medical abortion is an option for nearly all healthy adolescents seeking abortion in early pregnancy and may be offered through 63 days from the last menstrual period. Absolute contraindications include suspicion of ectopic pregnancy, current anticoagulation or clotting disorder, and allergy to Mifepristone or Misoprostol (16). Further contraindications include women with adrenal failure or severe asthma
and those receiving long-term glucocorticoid therapy (36). The efficacy for women with a pregnancy of less than 56 days' duration, the overall success rate with the combined use of Methotrexate and Misoprostol ranges from 84 to 97 percent. Efficacy is often defined as either immediate success (complete abortion before the administration of Misoprostol or during the 24 hours after its administration) or delayed success (complete abortion more than 24 hours after the administration of Misoprostol). The rate of immediate success is much lower than the overall success rate, because abortion is often delayed (36). In 12 to 35 percent of women abortion occurs approximately 20 to 30 days after the administration of Misoprostol (7). Among women with pregnancies of 49 days' duration or less, the success rate associated with the use of Mifepristone and a Prostaglandin ranges from 92 to 98 percent (38).

The most commonly used method for termination of pregnancy is suction curettage in the United States (39). It is usually performed between the 7th and 13th gestational weeks. Dilatation of the cervix is performed to allow insertion of instruments and removal of products of conception. Under seven weeks gestational age, dilatation of the cervix is not always necessary. There are various methods used to dilate the cervix including rigid or osmotic dilators or by using pharmacologic methods such as Misoprostol. By dilating the cervix, you can help prevent injuries that may occur during the surgical procedure including cervical laceration and uterine perforation. Risk factors for complications of this procedure include cervical stenosis, uterine anomalies, severe uterine flexion, and advanced gestational age (40).

Rigid dilatation is performed using instruments with increasing diameters. Osmotic dilators such as laminaria or the synthetic version, Lamicel, may decrease the risk of cervical injury and the risk of uterine perforation (41). Osmotic dilators have the disadvantage of time. They are placed several hours prior to the procedure to give them time to soften the cervix. Laminaria are packed in place with two 4 x 4 gauze sponges. Following insertion they are left in place for 12 to 18 hours. The patient is instructed to remain to clinic when instructed of if she develops cramping, bleeding, rupture of membranes, or fever. Failure to remove laminaria with 48 hours of placement can result in a severe infection.

Misoprostol, a Prostaglandin E1 analog, can also be used for preoperative cervical ripening. It is comparable to osmotic dilators in
reducing the amount of force needed for cervical dilatation (42). As mentioned previously, early complications from this procedure can include cervical laceration and uterine perforation. Other early complications include severe hemorrhage and the development of a hematoetra (also known as uterine distension syndrome or postabortal syndrome. This complication presents with immediate postoperative pain without vaginal bleeding. Onset is usually within the first hour after completion of the procedure. Treatment consists of immediate uterine evacuation and intramuscular Methylergonovine to ensure contraction of the uterus (43). The maternal mortality rate for first trimester abortions is lower than second trimester (0.1 to 0.4 deaths per 100,000 versus 1.7 to 8.9 per 100,000) (44).

Second trimester abortions (>13 weeks) account for 12% of abortions in the United States. Dilatation and Extraction (D&E) is the most common technique used for second trimester pregnancy termination in the United States. A greater amount of cervical dilatation is needed compared to the first trimester, thus osmotic dilators are often used (45). Under conscious sedation or general anesthesia, laminaria are removed and modified ovum forceps are inserted through the cervix to extract the fetus and placenta (46). The risk for hemorrhage and or perforation is great because the uterus is much larger, softer and more vascular. Acute risks include uterine injury, uterine atony, and amniotic fluid embolism (47).

Although a D&E is the most commonly used method for second trimester abortion, labor induction may also be used. Medications such as prostaglandins are used to induce labor, and the patient undergoes labor similar to the birthing process (16).

A significant concern from both healthcare providers and patients is whether obtaining an abortion will have a negative psychological impact on the patient. In adult women the research has clearly shown that abortion does not cause severe negative psychological sequelae when the female has freely chosen to terminate the pregnancy (48). Evaluating the psychological impact of abortion is especially important in the adolescent population due to the implications on legislation and health care policy. Although there are fewer studies particularly examining this population, there is research with positive results. Zabin et al (49) conducted a study of 360 adolescents aged 11-21 years, seeking pregnancy tests and
observed them for two years after obtaining a pregnancy test. The study examined those with negative pregnancy tests, those with positive test who terminated the pregnancy, and those with positive tests who carried to term. The overall results of the study showed that there was no evidence of negative psychological sequelae resulting from abortion (49).

However, Adler et al. (50) commented that while these studies prove that the adolescent is similar to the adult female regarding risk for psychological issues following an abortion, it is still important to screen the pregnant adolescent to determine those that are at risk. Factors which may be associated with a negative postabortion response include age, religion/religiosity, length of gestation, type of medical procedure, difficulty in deciding on abortion, wanting to be pregnant, perceived social support, relationship with partner, level of preabortion psychological functioning (48, 50). A study by Pope et al. (50) found similar results. The two variables that significantly correlated with a higher risk for postabortion psychological dysfunction were the subjects' preabortion emotional state, and the degree to which they felt pressured by their partners. The authors' recommendations were to obtain a preabortion assessment of baseline psychological functioning (focusing on depression) and to assess the degree to which the decision to favor the abortion is her own rather than succumbing to pressure from others. By taking these extra steps the provider can identify those adolescents who are at risk for adjustment difficulties if she chooses termination of pregnancy (50).

CARING FOR THE PREGNANT TEENAGER

As a health care provider of the pregnant adolescent, it is important to recognize the varying risks that she may face compared to adult pregnant females. As mentioned previously, research has shown that prenatal care regimens which provide social and behavioral services along with medical care improve the prenatal course, health of the mother, and neonatal outcomes (51). Furthermore, although the primary care provider may not be providing primary obstetric care, it is important to continue care of the mother to provide risk assessment and counseling on a continuing basis.
Despite an overall decline in adolescents' use of illicit drugs, smoking, and alcohol, there continues to be a high rate of substance abuse among adolescents in the United States (52). Due to this high prevalence, pregnant adolescent females are at risk for substance abuse especially during the first trimester. Obtaining a risk assessment of the female's behavior prior to pregnancy is informative as it will serve as a possible predictor of her behavior during pregnancy. The use of alcohol during the first coitus is a strong predictor of problem drinking before pregnancy as well as predicted drinking during the first trimester of pregnancy. Knowing her history and risk-taking behavior and then counseling may prevent the teratogenic effects of alcohol on fetus. Research has shown that the more educated the patient is on the fetal effect of alcohol, the less likely she is to drink during pregnancy (53). Furthermore, taking the time to understand the patient's social support as well as socioeconomic status may further predict risk-taking behavior during her pregnancy. Controlling for age and drinking during the first sexual encounter, pregnant adolescents from lower socioeconomic families were more likely to use alcohol before and after the first trimester. Moreover, girls who were more satisfied with their social support were less likely to use alcohol after the first trimester (54).

Tobacco use in the adolescent population continues to be a widespread public health concern. The Center for Disease Control (CDC) reported in 2006 that 23% of high school students in the United States are current cigarette smokers. Each day 4,000 young people between the ages of 12 and 17 years initiate cigarette smoking (55). In 2004, the Surgeon General reported that smoking during pregnancy increases the risk of complications including premature delivery, low birth weight infants, stillbirths and SIDS. In an adult study of females with a high prevalence of smoking it is estimated that cessation during pregnancy could prevent 10% of perinatal deaths, 35% of low birth weight births, and 15% of preterm deliveries (56). Obtaining a history of smoking cigarettes may provide a clue to other substance use. A secondary analysis of 1640 pregnant adolescents between the ages 15 and 19 years found that 53 percent of all users of either alcohol and/or cocaine had smoked cigarettes within 12 months prior to delivery. Furthermore, in this same study, smokers were four times more likely to use alcohol or cocaine compared to nonsmokers (57).
Marijuana is the most frequently used illicit drug in the United States and its use is on the rise especially among junior and high school students (58). The Youth Risk Behavior Surveillance in 2005 revealed that 38 percent of high school students had used marijuana at some point in their lives and 20 percent were reported as current users (used within the last month of completing the survey) (59). Studies on the effects of the fetus remain controversial. However, there is recent data that shows there may be later defects including cognitive deficits, impulsivity, inattention and hyperactivity. Furthermore, depressive symptoms, and substance abuse disorders have also been linked to in utero exposure to cannabis (60,61).

Cocaine use among adolescents is less compared to marijuana. Adolescents account for 6.2 percent of cocaine users in the United States. This is a decline in this specific age group over the last several years (6). Cocaine's effects in pregnancy are most likely related the amount abused and the gestational age of pregnancy. There are known and well researched adverse outcomes, including spontaneous abortion, prematurity, abruptio placenta, fetal demise, low birth weight, abnormal length and head circumference(s) (62).

Prescription drug abuse has increased dramatically over the recent years and in the United States has become a significant problem. A recent study published by Manchikanti et al. (63) revealed that 80 percent of the global opioid supply and 99 percent of the global Hydrocodone supply are being consumed by Americans. Furthermore, research has shown that 8.2 percent of teenagers between the ages 12 and 17 years have misused prescription drugs including opioids, stimulants, tranquilizers, and sedatives. Three percent of that population have endorsed symptoms related to prescription medication misuse in the past few years (63). There is evidence that shows that opioid use during pregnancy is not without negative consequences. Opiate dependent pregnant females show an increase in obstetric complications including preeclampsia, third trimester bleeding, malpresentation, nonreassuring fetal status, passage of meconium, low birth weight and an increase in perinatal mortality and puerperal morbidity (64).

Obtaining an accurate substance abuse can be difficult especially in the adolescent population. Many teens will not endorse substance abuse as they may not consider prescription medications as an abused
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substance especially if they are obtaining pills from a parent’s or caregiver’s prescription. Furthermore, it is always important to consider that patient will often under-report their drug and alcohol use. In counseling the patient and obtaining an accurate history it is important to explain to the patient the importance of knowing her complete drug and alcohol history to better care for not just her, but also the health of the fetus.

While obtaining a complete psychosocial history a careful review of the patient’s psychiatric history including any conditions within her family should be included. Anxiety and depression are more common in pregnant adolescents in comparison to non-pregnant adolescents (65-67). In a study by Caputo & Bordin (65) of 120 pregnant adolescents found that 23 percent had anxiety, 21 percent had depression and almost 17 percent had suicidal ideation. Freitas et al. (68) showed that there is a higher incidence of attempted suicide among pregnant teens compared to non-pregnant teens of the same cohort. Their study also had similar results of an increase in depression and anxiety among the pregnant adolescent population (68). Multiple studies have been performed examining the prevalence of mental illness among pregnant adolescents, and, while some studies show varying ranges of mental illness, one factor which has been consistent among the research is the significance of a social support system perceived by the female. Also, conflict with the father was strongly associated with an increased rate of depression among pregnant and postpartum adolescents (67).

Postpartum period is a critical time for the presence of mental illness among this population and indicates a need for close follow up from the primary care provider. In a prospective study by Schmidt et al (69) of 623 adolescent mothers, more than 50 percent experienced moderate to severe depressive symptoms during the first postpartum year. African Americans appeared to have the lowest rates of symptoms, but a higher rate of recurrence, when compared with Mexican-Americans and Caucasians (69). More family conflict, fewer social supports and low self esteem all were associated with increased rates of postpartum depression (70). Identifying teens that are at risk is imperative not only for the care of the adolescent, but also for the infant. There is clear evidence that shows that postpartum depression impacts the relationship between the mother and child by interfering with bonding, and the overall
development of the child (7). If symptoms persist over the first six months of the child’s life, developmental delay may occur (72).

**PREVENTION OF TEEN PREGNANCY**

Considering the high teen pregnancy rate in the United States, it is important to determine the public education about sex and contraception that is being provided as well as if this information is serving as an effective mechanism in helping to aid improving the rate of unintended pregnancies. The content of sex education remains controversial. Sexual education generally is taught in two different agendas. The first is abstinence-only sex, which promotes that sex should only be in a marital relationship. The second, comprehensive sexuality education, includes a discussion on abstinence, but also provides information on contraception to prevent unintended pregnancy and various methods to protect against sexually transmitted infections. Mainstream medical professional organizations, including the American College of Obstetricians and Gynecologists (ACOG), the Society of Adolescent Medicine (SAM), the American Academy of Pediatrics (AAP), the American Medical Association (AMA), and the American Public Health Association (APHA)and many others oppose abstinence-only education and endorse comprehensive sexuality education (see table 1).

**Table 1. Selected medical, public health and educational organizations supporting comprehensive sexual education. Source: Sexuality Information and Education Council of the United States**

American Academy of Child and Adolescent Psychiatry
American Academy of Pediatrics
American Association for Health Education
American Association of Family and Consumer Sciences
American Association of School Administrators
American College of Nurse-Midwives
American College of Obstetricians and Gynecologists
American Counseling Association
American Medical Association
Despite the significant difference between the United States and other developed countries and the policy statements of professional organizations the federal government funds contribute solely to abstinence only education and there is no designated federal funding that exists for comprehensive sexuality education (73).

**SEX EDUCATION POLICY**

For the fiscal year 2006, the federal government provided $178 million for abstinence-only education through Title V, Section 510 of the Social Security Act in 1096 (Section 510), Community-Based Abstinence Education (CBAE) projects and the Adolescent Family Life Act program (55,74). Federal law has established an eight point definition of abstinence-only education that emphasizes that sex outside of marriage is wrong and harmful. The law also prohibits programs from advocating contraceptive use or discussing contraceptive methods except to
emphasize their failure rates (75,76). Furthermore, between 1995 to 2002 research showed that abstinence-only education had increased in recent years, and education on birth control methods had decreased (77).

It is important for policy-makers, educators, parents and health care providers to be aware of government recommendations, what is being taught, and if these methods are succeeding. Health care providers need to be especially aware that they have the opportunity to provide counseling services and education to adolescents who may not be receiving information regarding sexual activity from other sources. The role of the primary care provider is to counsel and educate the sexually active patient on contraception, prevention of sexually transmitted infections, and family planning services. Prior to the onset of puberty it is recommended to engage in anticipatory conversations with the adolescent regarding pubertal changes. This not only provides the patient with knowledge of what to expect during puberty, but also creates a foundation of communication to enable the patient to feel more comfortable in future conversations. It is important to be aware of the patient's and his or her family values, cultural and religious beliefs which may affect adolescent sexuality.

For the sexually active teen, encourage communication with his or her partner: A study published in 2007 (78), illustrated that, the teens who communicated more with their parents about everyday life issues, the more likely they were to discuss contraception or sexually transmitted infections with their partners prior to sex. Although it is recommended to discuss sexuality with their teen, this study showed that parents can still serve as a protective factor by simply talking about a range of issues (78).

As discussed earlier, the primary care provider has a responsibility to discuss contraception with both male and female adolescents. Providing access to contraception is an important method of decreasing the rate of unintended pregnancies (79). It is important for the provider to be familiar with the various methods. While clinicians are often the main source of information regarding contraception, they often have misconceptions surrounding contraception, specifically, the combined oral contraceptive. Most of the misconceptions included, weight gain, hirsutism, acne, breast cancer risk, and future reproductive health (80).
Finally, one of the most important aspects in discussion with an adolescent is to address confidentiality. The primary reason adolescents may not obtain family planning or contraception education or services is concern of lack of confidentiality (79,81). States vary in their legislation regarding adolescent sexuality and confidentiality. Reviewing a specific state's requirements and then implementing a standard of care in the office setting can ensure both consistent and reassuring care for the patient, and also, safety for the office staff.

Providing a safe, nonthreatening, nonjudgmental place for the adolescent facing issues surrounding sexuality can lead to teens becoming more comfortable with changes occurring, and further promote healthy decision-making skills.

**PUBLIC HEALTH ISSUES**

Teen pregnancy is a major public health problem in the United States. The consequences of pregnancy on the teen and the fetus are complex and often result in lower socio economic and education status (82,83). This can cause serious long-term psychological impact on the teen. They are also at a greater risk of living as a single parent and can face hardships while they raising their child. Teen mothers are also at greater risk of becoming pregnant again. Data from the 1990's estimated that as much as 63 percent of teen mothers became pregnant within 1.5 years of their previous pregnancy (82). These teen mothers are less likely to utilize prenatal care. Conversely, they may be dependent on state and federal welfare for long period of time.

Children born to teen mothers are more likely to be of low birth weight and are often born premature. This puts the baby at risk for many neonatal/perinatal complications including fetal death. These children may have developmental, behavioral, and cognitive difficulties that often lead them to acquire lower educational attainment. They are also at risk of abuse and neglect. Since there is a significant impact on the teen mother and their child it is vital to understand the factors that may influence teen pregnancy. The following paragraphs will describe these factors.
- Early puberty: It is estimated that 10 to 15 percent of teen girls mature earlier than their peers and are less likely to effectively cope with their transition during puberty and therefore are at a greater risk of engaging in a high risk sexual behavior with the opposite gender (84). These teens often have company of older friends. This can be a direct risk factor for substance use initialization such as alcohol, and also indulgence in early sexual activity. Several studies have shown a direct link between early menarche and alcohol and cigarette use (84-86). Early menarche and early sexual activity often leads teens to have multiple partners and partners that are older to ll1em as well. Under the effect of alcohol, a teen may be disinhibited and also unlikely to use condoms and have unprotected intercourse (84).

- Inadequate contraceptive use: Although more teenagers are using contraceptives at the time of their initial intercourse, about half of the teen pregnancies occur in the first six months of sexual intercourse (11,87). Teens that use prescription contraceptives are less likely to use barrier contraceptives and thus are at a risk for pregnancy and sexually transmitted infections. Teens who are academically successful and are in a stable relationship and those who participate in programs that are open about sexual practices and contraceptive use are less likely to indulge in unsafe sexual practices (11,88).

- Childhood experiences: Adverse childhood experiences can led to whole host of negative outcome. Adverse experience can include emotional, physical, sexual abuse in childhood years. Other situations such as separated and divorced parents and parental substance use can also affect children and teens negatively. Teens that are exposed to such experiences are likely to indulge in early sexual activity, substance use, suicide attempts, and unintended pregnancy in adolescence and adult life as well (83,89). Family connectedness can greatly influence the childhood experiences in a positive way and thus decrease the negative impact of teen pregnancy and bad fetal outcome (83).

- Sexual victimization: Sexual victimization plays a very important role in early sexual activity and teen pregnancy but is
likely to be underreported. It is estimated that in the US about 7 to 9 percent of children and teens in the urban areas experience forced intercourse and dating violence (90). National data from 2006 suggest that as many as 1 in 4 women, teens and young adults, are subject to sexual coercion. It is also a well known fact that females are much more likely to be victimized when compared to males. Both boys and girls who have been previously been sexually victimized are at a greater risk for being part of teen pregnancy themselves. Boys who have gone through such victimization have a sense of inadequacy and can often adopt hyper masculine characteristics when it comes to their sexual behavior (91). As a result these males often have multiple sexual partners and indulge in early sexual activity (90).

- Socio-economic status (SES): Poverty is a major contributor in teen pregnancy. In the US, more than two third of adolescents who give birth to a child are from low-income families. It is also true that teenagers who undergo abortion belong to lower SES (11). Low academic achievement, high school drop out rates, decreased potential for generating income, and low health care utilization are factors that are well associated with lower SES. These directly affect the early sexual activity, teen pregnancy, and compromise fetal outcome.

**CONCLUSION**

Even though teen pregnancy rate has gone down recently, caring for a pregnancy teenager can be challenging. It is crucial to prevent teen pregnancy by implementing appropriate health prevention/promotion policies in a health care setting. A comprehensive contraceptive management approach should also be part of the standard when caring for a teen. Once a pregnancy has occurred, a pregnant teen should be offered a multi-disciplinary intervention to help her through the challenging process. This includes, her options of keeping/terminating the pregnancy and/or adoption possibilities. Finally, it is very crucial for a health care provider to continue to be part of the care during the teen’s pregnancy and post-delivery years to care for the young mother and her child.
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