6TH EDITION

ESSENTIALS of Maternity, Newborn, and Women's Health Nursing

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This book is dedicated to the love of my life, my husband, Glenn, who fortifies me and encourages me in all my endeavors. Appreciate your support, encouragement, and your expertise in editing. You are my rock and I am so blessed to have you at my side. And also, to my children, Brian and Jennifer, and my grandchildren—Alyssa, Leyton, Sandon, Peyton, Wyatt, Michael, Rylan, Brody, Veda, and Reese—who bring me life's greatest joys. You make it all worthwhile.

—SUSAN SCOTT RICCI

ABOUT THE AUTHOR

SUSAN SCOTT RICCI

Susan Scott Ricci earned a diploma in nursing from the Washington Hospital Center School of Nursing with a BSN and an MSN from the Catholic University of America located in Washington, DC, as well as an MEd in Counseling from the University of Southern Mississippi. She is licensed as a women's health nurse practitioner (APRN) by the University of Florida. She recently renewed her national certification as a certified nurse educator (CNE). She has worked in numerous women's health care settings including labor and birth, postpartum, prenatal, and family planning ambulatory care clinics. Susan has spent more than 30 years in practice and in nursing education teaching in LPN, ADN, and BSN programs. She is involved in several professional nursing organizations and holds memberships in Sigma Theta Tau International Honor Society of Nursing, Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN), American Nurses Association (ANA), National Association of OB/GYN Nurses, Who's Who in Professional Nursing, American Nurses Association, and the Florida Council of Maternal–Child Nurses.

With Susan's wealth of practical and educational experience, it is essential to concentrate on evidence-based nursing practice and reduce the amount of "nice to know" information that is presented to students. As an educator, she recognizes the tendency for nursing educators to want to "cover the world" when teaching, rather than focusing on the facts that students need to know for safe practice. With this mission in mind, Susan has directed her energy to the birth of these essential facts in this textbook.

She recognizes that nursing school instructional time is reduced, as the world of health care is expanding exponentially. Therefore, with the valuable instructional time allotted, she has recognized the urgent need to present pertinent facts as concisely as possible to promote application of knowledge within nursing practice.

PREFACE

This textbook is designed as a practical approach to understanding the health of women in a maternity context and the health of their newborns. Women in our society are becoming empowered to make informed and responsible decisions regarding their health and that of their newborns, but to do so, they need the encouragement and support of the nurses who care for them. This textbook focuses on the reproductive issues of women throughout the lifespan and arms the student or practicing nurse with essential, "need-to-know" information to care for women and their families and to assist them to make the right choices safely, intelligently, and with confidence.

Since the women and their families who are cared for come from well beyond our nation's borders, more cultural and global aspects of maternity and women's health care have been included in the sixth edition. The United States is part of the international community, and as such, nurses must understand and respect diverse cultures and their customs to truly play an important role as a global partner. More inclusive language has been included to represent all races and genders with reproductive issues. Nurses care for a variety of women from many continents, so they must be armed with appropriate tools to meet their clients' diverse needs. Also, more evidence-based research findings have been included in this sixth edition for nurses to validate their practice and interventions.

ORGANIZATION

Each chapter of this textbook reviews an important dimension of general health throughout the female life cycle and addresses risk factors, lifestyle choices that influence well-being, appropriate interventions, and nursing education topics to preserve female health and that of the newborn.

The text is divided into eight units.

Unit 1: Introduction to Maternity, Newborn, and Women's Nursing

Unit 1 helps build a foundation for the student beginning with the study of maternal–newborn and women's health nursing by exploring contemporary issues and trends and community-based nursing.

Unit 2: Women's Health Throughout the Lifespan

Unit 2 introduces the student to select women's health topics, including the structure and function of the reproductive system, common reproductive concerns, sexually transmitted infections, problems of the breast, and benign disorders and cancers of the female reproductive tract. This unit encourages students to assist women in maintaining their quality of life, reducing their risk of disease, and becoming active partners in their own health promotion activities and with their health care professionals.

Unit 3: Pregnancy

Unit 3 addresses topics related to normal pregnancy, including fetal development, genetics, and maternal adaptation to pregnancy. Nursing management during normal pregnancy is presented in a separate chapter encouraging application of basic knowledge to nursing practice. This nursing care chapter covers maternal and fetal assessment throughout pregnancy, interventions to promote self-care and minimize common discomforts, and client education.

Unit 4: Labor and Birth

Unit 4 begins with a chapter on the normal labor and birth process, including maternal and fetal adaptations. This is followed by a chapter discussing the nurse's role during normal labor and birth, which includes maternal and fetal assessment, pharmacologic and nonpharmacologic comfort measures and pain management, and specific nursing interventions during each stage of labor and birth.

Unit 5: Postpartum Period

Unit 5 focuses on maternal adaptation during the normal postpartum period. Both physiologic and psychological aspects are explored. Paternal adaptation is also considered. This unit also focuses on related nursing management, including assessment of physical and emotional status, promoting comfort, assisting with elimination, counseling about sexuality and contraception, promoting nutrition, promoting family adaptation, and discharge planning.

Unit 6: The Newborn

Unit 6 covers physiologic and behavioral adaptations of the normal newborn. It also delves into nursing management of the normal newborn, including immediate assessment and specific interventions as well as ongoing assessment, physical examination, and specific interventions during the early newborn period.

Unit 7: Childbearing at Risk

Unit 7 shifts the focus to at-risk pregnancy, childbirth, and postpartum care. Preexisting conditions of the woman, pregnancy-related complications, at-risk labor, emergencies associated with labor and birth, and medical conditions and complications affecting the postpartum woman are covered. Treatment and nursing management are presented for each medical condition. This organization allows the student to build on a solid foundation of normal material when studying the at-risk content.

Unit 8: The Newborn at Risk

Unit 8 continues to focus on at-risk content. Issues of the newborn with birth weight variations, gestational age variations, congenital conditions, and acquired disorders are explored. Treatment and nursing management are presented for each medical condition. This organization helps cement the student's understanding of the material.

RECURRING FEATURES

To provide the instructor and student with an exciting and user-friendly text, a number of recurring features have been developed.

Key Terms

A list of terms that are considered essential to the chapter's understanding is presented at the beginning of each chapter. Each key term appears in boldface, with the definition included in the text. Newly added to this edition are phonetic pronunciations for some of the most difficult-to-pronounce key terms.

Learning Objectives

Learning objectives included at the beginning of each chapter guide the student in understanding what is important and why, allowing them to prioritize information for learning. These valuable learning tools also provide opportunities for self-testing or instructor evaluation of student knowledge and ability.

Words of Wisdom

Each chapter opens with inspiring Words of Wisdom, which offer helpful, timely, and interesting thoughts. These WOW statements set the stage for each chapter and give the student valuable insight into nursing care of women and newborns.

Case Studies

Real-life scenarios present relevant maternity, newborn, and women's health information that is intended to perfect the student's caregiving skills. Questions about the scenario provide an opportunity for the student to critically evaluate the appropriate course of action.

Unfolding Patient Stories

Written by the National League for Nursing, Unfolding Patient Stories are an engaging way to begin meaningful conversations in the classroom. These vignettes, which appear at the end of the chapter of select chapters, feature patients from Wolters Kluwer's *vSim for Nursing | Maternity* (codeveloped with Laerdal Medical) and DocuCare products; however, each Unfolding Patient Story in the book stands alone, not requiring purchase of these products.

Evidence-Based Practice

The consistent promotion of evidence-based practice is a key feature of the text. Throughout the chapters, pivotal questions addressed by current research have been incorporated into Evidence-Based Practice boxes, which cite studies relevant to the chapter content.

Healthy People 2030

Throughout the textbook, relevant Healthy People 2030 objectives are outlined in box format. The nursing implications or guidance provided in the box serves as a road map for improving the health of women, mothers, and newborns.

Teaching Guidelines

An important tool for achieving health promotion and disease prevention is health education. Throughout the textbook, Teaching Guidelines raise awareness, provide timely and accurate information, and are designed to ensure the student's preparation for educating women about various issues.

Drug Guides

Drug Guide tables summarize information about commonly used medications. The actions, indications, and significant nursing implications presented assist the student in providing optimal care to women and their newborns.

Common Laboratory and Diagnostic Tests

Common Laboratory and Diagnostic Test tables in many of the chapters provide the student with a general

understanding of how a broad range of disorders are diagnosed. Rather than reading the information repeatedly throughout the narrative, the student is then able to refer to the table as needed.

Clinical Judgment & Nursing Process

The Clinical Judgment & Nursing Process boxes provide concrete examples of each step of the nursing process and are provided in numerous chapters. Found within the nursing process overview section of the chapter, they summarize issue- or system-related content and outline a guide for delivering care.

Comparison Charts

These charts compare two or more disorders or other easily confused concepts. They serve to provide an explanation that clarifies the concepts for the student.

Nursing Procedures

Step-by-step Nursing Procedures are presented in a clear, concise format to facilitate competent performance of relevant procedures as well as to clarify any variations when appropriate.

Consider This!

In every chapter, the student is asked to Consider This! These first-person narratives engage the student in real-life scenarios experienced by their patients. The personal accounts evoke empathy and help the student to perfect caregiving skills. Each box ends with an opportunity for further contemplation, encouraging the student to think critically about the scenario.

Take Note!

The *Take Note!* feature draws the student's attention to points of critical emphasis throughout the chapter. This feature is often used to stress life-threatening or otherwise vitally important information.

Tables, Boxes, Illustrations, and Photographs

Abundant tables and boxes summarize key content throughout the book. Additionally, beautiful illustrations and photographs help the student visualize the content. These features allow the student to quickly and easily access information.

Key Concepts

At the end of each chapter, Key Concepts provide a quick review of essential chapter elements. These bulleted lists help the student focus on the important aspects of the chapter.

References and Websites

References that were used in the development of the text are provided at the end of each chapter. These listings enable the student to further explore topics of interest. Many online websites are provided as a means for the student to electronically explore relevant content material. These resources can be shared with women, children, and their families to enhance patient education and support.

Developing Clinical Judgment

The Developing Clinical Judgment sections appear at the end of each chapter to assist the student in reviewing essential concepts. They include:

- **Practicing for NCLEX**—These NCLEX-RN style questions (multiple choice, multiple response, fill in the blanks) test the student's ability to utilize critical thinking in the application of the nursing process to chapter material. The questions are styled similarly to the national licensing exam (NCLEX-RN).
- **Critical Thinking Exercises**—These exercises challenge the student to incorporate new knowledge with previously learned concepts and reach a satisfactory conclusion. They encourage the student to think critically, problem solve, and consider their own perspective on given topics.
- **Study Activities**—These interactive activities promote student participation in the learning process. This section encourages increased interaction/learning via clinical, online, and community activities.
- **Answers**—Answers to the Developing Clinical Judgment questions are provided to instructors on thePoint.

INCLUSIVE LANGUAGE

A note about the language used in this book: Wolters Kluwer recognizes that people have a diverse range of identities, and we are committed to using the most inclusive, nonbiased language possible in our products. In line with the principles of nursing, we strive not to define people by their diagnoses, but to recognize their personhood first and foremost, using as much as possible the language diverse groups use to define themselves, and including only information that is relevant to nursing care. We strive to better address the unique perspectives, complex challenges, and lived experiences of diverse populations traditionally underrepresented in

health literature. When describing or referencing populations discussed in research studies, we will adhere to the identities presented in those studies to maintain fidelity to the evidence presented by the study investigators. We follow best practices of language set forth by the *Publication Manual of the American Psychological Association*, 7th edition, but acknowledge that language evolves rapidly, and we anticipate continuing to modify our language in future editions of our products.

TEACHING–LEARNING PACKAGE

Instructor's Resources

Tools to assist you with teaching your course are available upon adoption of this text on thePoint at http://thePoint.lww.com/Ricci6e.

- An **E-Book** on thePoint gives you access to the book's full text and images online.
- A **Test Generator** lets you put together exclusive new tests from a bank containing **over 800 questions** to help you in assessing your students' understanding of the material. Test questions link to chapter learning objectives.
- **PowerPoint presentations** with **Guided Lecture Notes** provide an easy way for you to integrate the textbook with your students' classroom experience, either via slide shows or handouts. Multiple choice and true/false questions are integrated into the presentations to promote class participation.
- An **Image Bank** lets you use the photographs and illustrations from this textbook in your PowerPoint slides or as you see fit in your course.
- **Pre-Lecture Quizzes** (and answers) are quick, knowledge-based assessments that allow you to check students' reading.
- Sample **Syllabi** provide guidance for structuring your maternity nursing courses and are provided for four different course lengths: 4, 6, 8, and 10 weeks.
- **Journal Articles**, updated for the new edition, offer access to current research available in Lippincott Williams & Wilkins journals.
- **Watch and Learn Videos**
  Free video clips located on thePoint highlight key aspects of pregnancy and birth.

Contact your sales representative or check out LWW.com/Nursing for more details and ordering information.

Lippincott CoursePoint+

The same trusted solution, innovation, and unmatched support that you have come to expect from Lippincott CoursePoint+ is now enhanced with more engaging learning tools and deeper analytics to help prepare students for practice. This powerfully integrated, digital learning solution combines learning tools, case studies, virtual simulation, real-time data, and the most trusted nursing education content on the market to make curriculum-wide learning more efficient and to meet students where they're at in their learning. And now, it's easier than ever for instructors and students to use, giving them everything they need for course and curriculum success!

Lippincott CoursePoint+ includes:

- Engaging course content provides a variety of learning tools to engage students of all learning styles.
- A more personalized learning approach, including adaptive learning powered by PrepU, gives students the content and tools they need at the moment they need it, giving them data for more focused remediation and helping to boost their confidence.
- Varying levels of case studies, virtual simulation, and access to Lippincott Advisor help students learn the critical thinking and clinical judgment skills to help them become practice-ready nurses.
- Unparalleled reporting provides in-depth dashboards with several data points to track student progress and help identify strengths and weaknesses.
- Unmatched support includes training coaches, product trainers, and nursing education consultants to help educators and students implement CoursePoint with ease.

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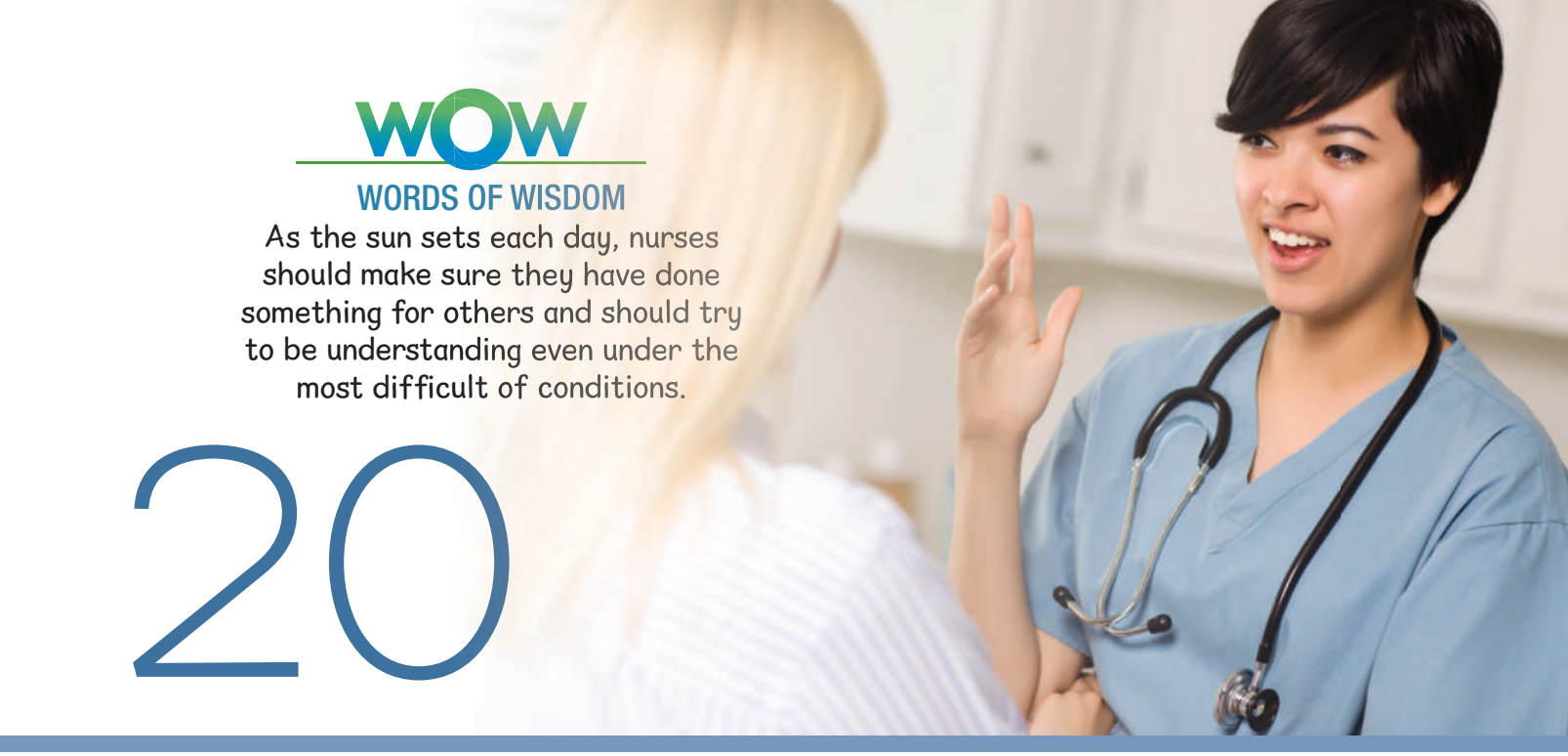

WOW

WORDS OF WISDOM

As the sun sets each day, nurses should make sure they have done something for others and should try to be understanding even under the most difficult of conditions.

20

Nursing Management of the Pregnancy at Risk: Selected Health Conditions and Vulnerable Populations

LEARNING OBJECTIVES

Upon completion of the chapter, you will be able to:

1. Identify conditions present before pregnancy that can have negative effects on a pregnancy.
2. Examine how a condition present before pregnancy can affect the pregnant person physiologically and psychologically when they become pregnant.
3. Evaluate the nursing assessment and management for a pregnant person with diabetes from that of a pregnant person without diabetes.
4. Explore how congenital and acquired heart conditions can affect a pregnancy.
5. Design the nursing assessment and management of a pregnant person with cardiovascular disorders and respiratory conditions.
6. Differentiate the types of anemia affecting pregnant people in terms of prevention and management.
7. Relate the nursing care needed for the pregnant person with an autoimmune disorder.
8. Compare the most common infections that can jeopardize a pregnancy and propose possible preventive strategies.

KEY TERMS

acquired immunodeficiency syndrome (AIDS) (ă-kwĪrd' im'yū-nō-dō-fish'en-sē sin'drōm)
adolescence
anemia
fibromyalgia (fi-bro-my-al-gi-a)
gestational diabetes mellitus
human immunodeficiency virus (HIV)
neonatal opioid withdrawal syndrome (NOWS)
perinatal drug misuse
pregestational diabetes
teratogen

9. Develop a plan of care for the pregnant person who is HIV-positive.
10. Outline the nurse's role in the prevention and management of adolescent pregnancy.
11. Determine the impact of pregnancy on a person over the age of 35.
12. Analyze the effects of substance misuse during pregnancy.

Rose, a 16-year-old who appears far along in her pregnancy, came into the clinic wheezing and having difficulty catching her breath. She had missed several previous prenatal visits but arrived at the clinic today in distress. Rose has a history of asthma since she was 5 years old. How might her current condition affect her pregnancy? Is this picture typical of a pregnant person with asthma?

INTRODUCTION

Pregnancy can be a special time in a person's life, but it can also be anxiety producing if it is accompanied by medical conditions that might complicate the pregnancy and jeopardize the fetal outcome. Ideally, the pregnant person is free of any conditions that can affect a pregnancy, but in reality, many people enter pregnancy with a multitude of health-related or psychosocial issues that can have a negative impact on the outcome. Currently, because of the obesity epidemic in the United States and people postponing their pregnancies until later in their lives, nurses will increasingly see more people with medical conditions that affect their pregnancies.

Many pregnant people express hope that their babies are born healthy. Nurses can play a major role in helping this become a reality by educating people about health promotion before they become pregnant. Conditions such as diabetes, cardiac and respiratory disorders, anemia, autoimmune disorders, and specific infections can frequently be controlled through close prenatal management so that the impact on pregnancy is minimized. Nurses can provide pregnancy prevention strategies when counseling adolescents. Meeting the developmental needs of pregnant adolescents is a challenge. Finally, lifestyle choices can place many people at risk during pregnancy, and nurses need to remain nonjudgmental when working with these populations. The use of alcohol, nicotine, and illicit substances during pregnancy is addressed in Healthy People 2030 as outlined in Healthy People 2030 box.

Chapter 19 described pregnancy-related conditions that place the pregnant person at risk. This chapter addresses common conditions that can have a negative impact on pregnancy and special populations at risk, outlining appropriate nursing assessment and management for each condition or situation. The unique skills of nurses, in conjunction with the other members of the health care team, can increase the potential for a positive outcome in many high-risk pregnancies.

DIABETES MELLITUS

Diabetes is a global public health concern with potential implications for the health of pregnant people with diabetes and their offspring. The prevalence of this condition in pregnancy has been increasing in relation to the global epidemic of obesity. Worldwide, one in seven pregnant people are diagnosed with gestational diabetes, which confers short- and long-term health risks for both the pregnant person and their child (Fuller et al., 2022). People in ethnic minority groups are affected more frequently than White European people (15% vs. 6%) (Fuller et al., 2022). Diabetes is a chronic disease characterized by a relative lack of insulin or the absence of the hormone that is necessary for glucose metabolism. The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of the eyes, kidneys, nerves, heart, and blood vessels.

With diabetes, there is a deficiency of or resistance to insulin. This interferes with the body's ability to obtain essential nutrients for fuel and storage. Pregestational diabetes and gestational diabetes greatly affect the profound metabolic alterations during pregnancy that are necessary to support the growth and development of the fetus.

Diabetes is commonly classified based on disease etiology (Balasubramanyam, 2024). These groups include:

- **Pregestational diabetes**: Alteration in carbohydrate metabolism identified before conception
  - **Type 1 diabetes**: Absolute insulin deficiency due to autoimmune beta cell destruction
  - **Type 2 diabetes**: Insulin resistance or deficiency due to a progressive loss of beta cell insulin secretion frequently on the background of insulin resistance
- **Gestational diabetes mellitus**: Glucose intolerance with its onset during pregnancy usually diagnosed in the second or third trimester of pregnancy that was not clearly overt prior to gestation. Gestational diabetes

has become increasingly prevalent over the last three decades (Gregory & Ely, 2022).

Gestational diabetes is associated with neonatal complications such as macrosomia, hypoglycemia, birth trauma due to shoulder dystocia, and respiratory distress syndrome. Maternal complications include hypertension, preeclampsia, cesarean birth, and increased risk of developing diabetes mellitus (Rodriguez & Mahdy, 2023). Further specific issues related to the effects of diabetes on the pregnant person and fetus are provided in Table 20.1. During the past several decades, great strides have been made in improving the outcomes of pregnancy in people with diabetes, but this chronic metabolic disorder remains a high-risk condition during pregnancy. A favorable outcome requires commitment on the pregnant person's part to adhere to frequent prenatal visits, dietary restrictions, self-monitoring of blood glucose levels, frequent laboratory tests, intensive fetal surveillance, and perhaps hospitalization.

Pathophysiology

Pregnancy is characterized by a series of metabolic changes that promote accumulation of adipose tissue in early pregnancy followed by insulin resistance later in gestation. Maternal metabolism is directed toward supplying adequate nutrition for the fetus. In pregnancy, placental hormones cause insulin resistance at a level that tends to parallel the growth of the fetoplacental unit. As the placenta grows, more placental hormones are secreted. Human placental lactogen (hPL), progesterone, cortisol, prolactin, and growth hormone (somatotropin) increase in direct correlation with the growth of placental tissue, rising throughout the last 20 weeks of pregnancy and causing insulin resistance. Subsequently, insulin secretion increases to overcome the resistance of these two hormones. In the pregnant person without diabetes, the pancreas can respond to the demands for increased insulin production to maintain normal glucose levels throughout the pregnancy. However, the person with glucose intolerance or diabetes during pregnancy cannot cope with changes in metabolism resulting from insufficient insulin to meet needs during gestation (Fu & Retnakaran, 2022).

Reduced sensitivity to insulin in the liver, muscle, and adipose tissue, and a progressive decline in pancreatic beta cell function lead to impaired insulin secretion, eventually resulting in hyperglycemia (Sharma et al., 2022). With gestational diabetes, pancreatic beta cell dysfunction likely exists prior to pregnancy. This problem is then unmasked by the development of insulin resistance during pregnancy, which requires enhanced insulin production to maintain normal blood glucose ranges.

Therapeutic Management

Therapeutic care for the pregnant person with diabetes focuses on glycemic control, to decrease risk to both the pregnant person and the fetus.

TABLE **20.1** • Diabetes and Pregnancy: Effects on the Birthing Parent and Fetus

Effects on the Parent	Effects on the Fetus/Neonate
• Polyhydramnios due to fetal diuresis caused by hyperglycemia • Gestational hypertension of unknown etiology • Ketoacidosis due to uncontrolled hyperglycemia • Preterm labor secondary to premature membrane rupture • Stillbirth in pregnancies complicated by ketoacidosis and poor glucose control • Hypoglycemia as glucose is diverted to the fetus (occurring in the first trimester) • Urinary tract infections resulting from excess glucose in the urine (glucosuria), which promotes bacterial growth • Chronic monilial vaginitis due to glucosuria, which promotes the growth of yeast • Difficult labor, cesarean birth, postpartum hemorrhage secondary to an overdistended uterus to accommodate a macrosomic infant	• Cord prolapse secondary to polyhydramnios and abnormal fetal presentation • Congenital anomaly due to hyperglycemia in the first trimester (cardiac problems, neural tube defects, skeletal deformities, and genitourinary problems) • Macrosomia resulting from hyperinsulinemia stimulated by fetal hyperglycemia • Birth trauma due to the increased size of the fetus, which complicates the birthing process (shoulder dystocia) • Preterm birth secondary to polyhydramnios and an aging placenta, which places the fetus in jeopardy if the pregnancy continues • Fetal asphyxia secondary to fetal hyperglycemia and hyperinsulinemia • Intrauterine growth restriction secondary to maternal vascular impairment and decreased placental perfusion, which restricts growth • Perinatal death due to poor placental perfusion and hypoxia • Respiratory distress syndrome resulting from poor surfactant production secondary to hyperinsulinemia inhibiting the production of phospholipids, which make up surfactant • Polycythemia due to excessive red blood cell (RBC) production in response to hypoxia • Hyperbilirubinemia due to excessive RBC breakdown from hypoxia and an immature liver unable to break down bilirubin • Neonatal hypoglycemia resulting from ongoing hyperinsulinemia after the placenta is removed • Subsequent childhood obesity and carbohydrate intolerance

Cunningham, F. G., Leveno, K. J., Dashe, J. S., Hoffman, B. L., Spong, C. Y., & Casey, B. M. (2022d). Diabetes mellitus. In F. G. Cunningham, K. J. Leveno, J. S. Dashe, B. L. Hoffman, C. Y. Spong, & B., M. Casey, *William's obstetrics* (26th ed.). McGraw Hill.

Preconception Counseling for the Person With Pregestational Diabetes

Pregestational diabetes is a significant public health problem that increases the risk for structural birth defects affecting both maternal and neonatal pregnancy outcomes. People who have pregestational diabetes need comprehensive prenatal care. Achieving good metabolic control during the period prior to conception is essential to reducing congenital malformations that can occur in pregnancies complicated by diabetes. Preconception counseling is essential for the person with pregestational diabetes to ensure that the disease state is stable. The goals of preconception care involve a discussion of potential adverse outcomes and specifically are to:

- Integrate the person into the management of their diabetes.
- Achieve the lowest glycosylated hemoglobin A1c (HgbA1C) test results without excessive hypoglycemia.
- Ensure effective contraception until stable glycemia is achieved.
- Identify and evaluate long-term diabetic complications such as retinopathy, nephropathy, neuropathy, cardiovascular disease (CVD), and hypertension (Seely & Powe, 2024).

Care for the Pregnant Person With Diabetes

Lifestyle modification, nutritional changes, and encouragement of physical activities form the primary mode of therapy for diabetes during pregnancy. Therapeutic care of the pregnant person with diabetes mellitus focuses on tight glucose control. The recommendations include a fasting blood glucose level below 95 mg/dL with postprandial levels below 140 mg/dL at 1 hour and below 120 mg/dL at 2 hours (ElSayed et al., 2023). Such tight control has been advocated because it is associated with a reduction in macrosomia.

PHARMACOLOGIC THERAPY FOR DIABETES

The person with type 1 diabetes will need to continue insulin therapy throughout pregnancy. For the person with gestational diabetes, nutritional management and exercise may be all that are necessary. Pharmacologic therapy is considered if nutrition and exercise fail to maintain target glucose levels.

In uncontrolled gestational diabetes, in which target glycemic levels cannot be reached, insulin is also required. The Americans With Disabilities Act (ADA) affirms the use of insulin as the first-line pharmacotherapy for gestational diabetes when medication is necessary to control blood glucose levels (ElSayed et al., 2023). Insulin, which does not cross the placenta, has historically been the medication of choice for treating hyperglycemia in pregnancy. Combining intermediate- and short-acting insulin yields the best result for most patients. Two insulin doses are given daily with two thirds of the total insulin in the morning to cover the energy needs of the active day and one third at night. Insulin pump technology can also be used to regulate glucose levels. Generally, for the person with type 1 diabetes, insulin doses are reduced in the first trimester to prevent hypoglycemia resulting from increased insulin sensitivity as well as from nausea and vomiting. Short-acting insulins, which do not cross the placenta, may help reduce postprandial hyperglycemia and episodes of hypoglycemia between meals.

Some patients with diabetes cannot use insulin safely during pregnancy due to cost, language barriers, lack of comprehension, or cultural influences. Oral agents may be used as an alternative, after a discussion of risks. Metformin readily crosses the placenta and can cause neonatal hypoglycemia. It should not be used in pregnant people with hypertension or preeclampsia (ElSayed et al., 2023). Insulin therapy or oral hypoglycemic agents in addition to diet and exercise are major elements of achieving glycemic control (see Evidence-Based Practice 20.1).

After giving birth, the overt glycemic abnormalities of gestational diabetes usually resolve. This phenomenon suggests that diabetes is transient and that the consequences of gestational diabetes end with the birth of the infant. However, for the birthing parent, childbirth is not the end of the story. The diagnosis of gestational diabetes heralds future health risks. Knowledge of this "failed" stress test conveys new information about their future risk for type 2 diabetes, which warrants further screening and prevention efforts during the postpartum period and beyond.

Nursing Assessment

Nursing assessment begins at the first prenatal visit. A thorough history and physical examination in conjunction with specific laboratory and diagnostic testing aids in developing an individualized plan of care for the person with diabetes. Early screening, ideally before 13 weeks' gestation, is important to identify pregestational diabetes (Trout, 2019).

Health History and Physical Examination

For the person with pregestational diabetes, obtain a thorough history of the preexisting diabetic condition. Ask about the duration of the disease, management of glucose levels (insulin injections, insulin pump, or oral hypoglycemic agents), dietary adjustments, presence of vascular complications and current vascular status, current insulin regimen, and technique used for glucose testing. Review any information that they may have received as part of their preconception counseling and measures that were implemented during this time.

EVIDENCE-BASED PRACTICE **20.1**

Effects of Resistance Exercise on Blood Glucose Level and Pregnancy Outcome in Patients With Gestational Diabetes Mellitus: A Randomized Controlled Study

BACKGROUND

Gestational diabetes accounts for about 90% to 95% of the total number of people with hyperglycemia during pregnancy and has increased by more than 30% in the last two decades. Adverse outcomes of this condition include preterm births, neonatal respiratory distress, fetal macrosomia, and increased risk of type 2 diabetes 5 to 10 years post childbirth for both the birthing parent and offspring. It is important to prevent these adverse outcomes to improve the health of parent and child. The purpose of this study was to investigate the effect of resistance exercise versus aerobic exercise on blood glucose level, insulin utilization rate, and pregnancy outcomes.

STUDY

Excessive gestational weight gain is associated with several adverse events and pathology during pregnancy for both the birthing parent and the fetus. Physical activity is an essential component for people with gestational diabetes. Exercise increases glucose uptake and increases insulin sensitivity, thus decreasing insulin resistance. Early intervention can positively impact pregnancy outcomes.

A randomized controlled trial included 100 pregnant people divided into an aerobic exercise group (51) and a resistance exercise group (49). Both groups received exercise intervention for 50 to 60 minutes, three times weekly, lasting for 6 weeks, in addition to their routine maternity care.

Findings

The resistance exercise group showed better postprandial blood glucose and exercise compliance than the aerobic exercise group. Resistance exercise is easier to perform, has better adherence, and is conducive to being carried out throughout pregnancy and postpartum.

Nursing Implications

The result of this study indicates that resistance and/or aerobic exercise throughout pregnancy can reduce the risk of adverse events and lower glucose levels. Resistance exercise is easier to perform, especially in late pregnancy because it can be carried out in a sitting position or lying down. Nurses should inform people about the benefits of exercise and provide literature and resources about specific exercises to engage in. Writing out a "prescription" for the type and amount of exercise may help people recognize the importance of this intervention and encourage them to do it. Encourage them to keep a daily log to track their regimen, and ask about it at every prenatal visit.

Adapted from Xie, Y., Zhao, H., Zhao, M., Huang, H., Liu, C., Huang, F., & Wu, J. (2022). Effects of resistance exercise on blood glucose level and pregnancy outcome in patients with gestational diabetes mellitus: A randomized controlled trial. *BMJ Open Diabetes Research and Care*, *10*(2), e002622. https://doi.org/10.1136/bmjdrc-2021-002622

Be knowledgeable about the person's nutritional requirements and assess the adequacy and pattern of their dietary intake. Assess their blood glucose self-monitoring in terms of technique, frequency, and ability to adjust the insulin dose based on the changing patterns. Ask about the frequency of episodes of hypoglycemia or hyperglycemia to ascertain their ability to recognize and treat them. Continue to assess for signs and symptoms of hypoglycemia and hyperglycemia.

During antepartum visits, assess the patient's knowledge about their disease, including the signs and symptoms of hypoglycemia, hyperglycemia, and diabetic ketoacidosis; insulin administration techniques; and the impact of pregnancy on their chronic condition. If possible, have the person demonstrate their technique for blood glucose monitoring and insulin administration if appropriate. Exercise patience and understanding while frequently encouraging and reinforcing all verbal instructions with written material (Fig. 20.1).

Assess the risk for gestational diabetes at the first prenatal visit. Risk factors for gestational diabetes include:

- Overweight (body mass index [BMI] 25 to 29.9) or obesity (BMI ≥30)
- History of gestational diabetes or polyhydramnios in a previous pregnancy
- First-degree relative with diabetes
- Polycystic ovary syndrome
- Previous infant weighing more than 9 lb (4,000 g)
- Hypertension before pregnancy or in early pregnancy
- Hispanic, Native American, Pacific Islander, or African ancestry
- Signs and symptoms of glucose intolerance (polyuria, polyphagia, polydipsia, fatigue) (Rodriguez & Mahdy, 2023)

FIGURE 20.1 The nurse is demonstrating the technique for self-blood glucose monitoring with a pregnant patient who has diabetes.

People with clinical characteristics consistent with a high risk for gestational diabetes should undergo glucose testing as soon as feasible.

Also assess the person's psychosocial adaptation to their condition. This assessment is critical to gain cooperation for a change in regimen or the addition of a new regimen throughout pregnancy. Identify their support systems and note any financial constraints, because they will need intense monitoring and frequent fetal surveillance.

Laboratory and Diagnostic Testing

The diagnosis of preexisting previously undiagnosed diabetes may be made in early pregnancy. Screening for gestational diabetes routinely occurs at 24 to 28 weeks' gestation. Table 20.2 provides information on diagnosing and classifying hyperglycemia in pregnancy. People with pregestational diabetes and those diagnosed with gestational diabetes require ongoing maternal and fetal surveillance to promote the best outcome.

SURVEILLANCE

Maternal surveillance may include:

- Urine check for protein (may indicate the need for further evaluation for preeclampsia) and for nitrates and leukocyte esterase (may indicate a urinary tract infection)
- Urine check for ketones (may indicate the need for evaluation of eating habits)
- Kidney function evaluation every trimester for creatinine clearance and protein levels

TABLE 20.2 • Recommendations for Diagnosing and Classifying Hyperglycemia in Pregnancy

When	Diagnosis	Test	Cutoff for Diagnosis
First prenatal visit	Overt (pregestational) diabetes	Fasting HgbA1C Random	126 mg/dL >7% 200 mg/dL
24–28 weeks	Gestational diabetes	Fasting	<92 mg/dL
		75 g OGTT–1 hour	<180 mg/dL
		75 g OGTT–2 hour	<153 mg/dL

HgbA1C, glycosylated hemoglobin; OGTT, oral glucose tolerance test.

American Diabetes Association. (2020a). Classification and diagnosis of diabetes: Standards of medical care in diabetes—2020. *Diabetes Care*, *43*(Supplement 1), S14–S31. https://doi.org/10.2337/dc20-S002; and American Diabetes Association. (2020b). Glycemic targets: Standards of medical care in diabetes—2020. *Diabetes Care*, *43*(Supplement 1), S66–S76. https://doi.org/10.2337/dc20-S006

- Eye examination in the first trimester to evaluate the retina for vascular changes
- HgbA1C every 4 to 8 weeks to monitor glucose trends (Zera & Brown, 2023)

Fetal surveillance may include ultrasound to provide information about fetal growth, activity, and amniotic fluid volume and to validate gestational age.

Nursing Management

The ideal outcome of every pregnancy is a healthy newborn and birthing parent. Nurses can be pivotal in realizing this positive outcome for people with pregestational or gestational diabetes by implementing measures to minimize risks and complications. Since the person with diabetes is considered to be at high risk, prenatal visits occur more frequently (every 2 weeks up to 28 weeks and then twice a week until birth), providing the nurse with numerous opportunities for ongoing assessment, education, and counseling (Clinical Judgment & Nursing Process 20.1).

Providing Appropriate Nutrition

In addition to the nursing interventions provided earlier, the person with gestational diabetes needs nutritional counseling from the nurse or a registered dietitian. Nutritional management focuses on maintaining balanced glucose levels and providing enough energy and nutrients for the pregnant person and developing fetus while avoiding ketosis and minimizing the risk of hypoglycemia in people treated with insulin. For the patient to adopt and follow the nutritional plan, it must be in keeping with their present cultural dietary patterns and not radically different (Palmer, 2021). Nutrient-dense carbohydrates are a vital part of the diet, as they support glucose control, reduce free fatty acids, improve insulin action, and provide vascular benefits (Krewson, 2022). It is recommended to limit consumption of sugary beverages; read food labels; and include grains, oats, beans, vegetables, fruit, and dairy products in the diet. People who receive dietary advice and follow it have been shown to have better pregnancy outcomes than those who do not receive dietary advice (Helm et al., 2022).

Recommend three healthy meals per day using the Diabetes Plate Method. With this method, the pregnant person with diabetes should plan each meal based on a 9-in-diameter dinner plate half-filled with nonstarchy vegetables, quarter filled with lean protein, and quarter filled with complex carbohydrate foods, accompanied by water or other zero-calorie beverages. Snacks should be high in protein, fiber, and/or healthy fats (Diabetes Food Hub Team, 2020). For assistance with meal planning, refer patients to the American Diabetes Association's Diabetes Food Hub site (https://www.diabetesfoodhub.org/articles/tips-for-using-the-diabetes-food-hub-meal-planner-and-grocery-list.html) (Fig. 20.2).

CLINICAL JUDGMENT & NURSING PROCESS 20.1 Overview of the Pregnant Person With Type 1 Diabetes

Patty, a 30-year-old pregnant person with type 1 diabetes, presents to the maternity clinic for preconception care. She has had diabetes for 8 years and takes insulin twice daily by injection. She does blood glucose self-monitoring four times daily. She reports that her disease is fairly well controlled but says, "I'm worried about how my diabetes will affect a pregnancy and my baby. Will I need to make changes in my routine? Will my baby be normal?" She reports that she recently had a foot infection and needed to go to the emergency department because it led to an episode of ketoacidosis. She states that her last HgbA1C test results were abnormal.

NURSING ANALYSIS: Altered health maintenance: Maternal related to lack of knowledge regarding care in the diabetic condition in pregnancy as evidenced by questions about the effect on pregnancy, possible changes in regimen, and pregnancy outcome

OUTCOME IDENTIFICATION AND EVALUATION

The patient will demonstrate increased knowledge of type 1 diabetes and its effects on pregnancy as evidenced by proper techniques for blood glucose monitoring and insulin administration, the ability to modify insulin doses and dietary intake to achieve control, and verbalization of the need for glycemic control prior to pregnancy with blood glucose levels remaining within normal range.

INTERVENTIONS: *Providing Patient Teaching*

- Assess patient's knowledge of diabetes and pregnancy *to establish a baseline from which to develop an individualized teaching plan.*
- Review the underlying problems associated with diabetes and how pregnancy affects glucose control *to provide patient with a firm knowledge base for decision making.*
- Review signs and symptoms of hypoglycemia and hyperglycemia and prevention and management measures *to ensure patient can deal with them should they occur.*
- Provide written materials describing diabetes and care needed for control *to provide an opportunity for patient's review and promote retention of learning.*
- Observe patient administering insulin and self-glucose testing for technique and offer suggestions for improvement if needed *to ensure adequate self-care ability.*
- Discuss proper foot care *to prevent future infections.*
- Teach home treatment for symptomatic hypoglycemia *to minimize risk to patient and fetus.*
- Outline acute and chronic diabetic complications *to reinforce the importance of glucose control.*
- Discuss the use of contraceptives until blood glucose levels can be optimized before conception occurs *to promote the best possible health status before conception.*
- Explain the rationale for good glucose control and the importance of achieving excellent glycemic control before pregnancy *to promote a positive pregnancy outcome.*
- Review self-care practices (blood glucose monitoring and frequency of testing; insulin administration; adjustment of insulin dosages based on blood glucose levels) *to foster independence in self-care and feelings of control over the situation.*
- Refer patient for dietary counseling *to ensure optimal diet for glycemic control.*
- Outline obstetric management and fetal surveillance needed for pregnancy *to provide patient with information on what to expect.*
- Discuss strategies for maintaining optimal glycemic control during pregnancy *to minimize risks to patient and fetus.*

NURSING ANALYSIS: Acute anxiety related to the threat to self and fetus as evidenced by questions about the effect of the patient's condition on the baby and baby being healthy

OUTCOME IDENTIFICATION AND EVALUATION

The patient will openly express feelings related to diabetes and pregnancy as evidenced by statements of feeling better about their preexisting condition and pregnancy outlook, and statements of understanding related to future childbearing by linking good glucose control with positive outcomes for both the patient and offspring.

INTERVENTIONS: *Minimizing Anxiety*

- Review the need for a physical examination *to evaluate for any effects of diabetes on the patient's health status.*
- Explain the rationale for assessing patient's blood pressure, vision, and peripheral pulses at each visit *to provide information related to possible effects of diabetes on health status.*
- Identify any alterations in the present diabetic condition that need intervention *to aid in minimizing risks that may increase patient's anxiety level.*
- Review potential effects of diabetes on pregnancy *to promote patient understanding of risks and ways to control or minimize them.*
- Encourage active participation in decision making and planning pregnancy *to promote feelings of control over the situation and foster self-confidence.*
- Discuss feelings about future childbearing and managing pregnancy *to help reduce anxiety related to uncertainties.*
- Encourage patient to ask questions or voice concerns *to help decrease anxiety related to the unknown.*
- Emphasize the use of frequent and continued surveillance of patient and fetal status during pregnancy *to reduce the risk of complications and aid in alleviating anxieties related to the unknown.*
- Provide positive reinforcement for healthy behaviors and actions *to foster continued use and enhancement of self-esteem.*

FIGURE 20.2 The pregnant patient with diabetes eating a nutritious meal to ensure adequate glucose control.

Promoting Physical Activity

Exercise is another important component of comprehensive prenatal care for the pregnant person with glucose intolerance. Regular exercise helps maintain glucose control by increasing the uptake of glucose into the cells and decreasing central body weight, hypertension, and dyslipidemia. This will ultimately decrease the person's insulin requirement. Regular physical activity has been proven to result in marked benefits for the birthing parent and fetus. Maternal benefits include improved cardiovascular function, limited pregnancy weight gain, decreased musculoskeletal discomfort, reduced incidence of muscle cramps and lower limb edema, mood stability, and reduction of gestational diabetes mellitus and gestational hypertension. Fetal benefits include decreased fat mass, improved stress tolerance, and advanced neurobehavioral maturation. Moderately intense exercise for 20 to 30 minutes on most days, or at least 150 minutes of moderately intense aerobic activity per week, is recommended (Onaade et al., 2021).

TAKE NOTE!

Nutrient requirements and recommendations for weight gain for the pregnant person with diabetes are the same as those for pregnant people without diabetes.

Promoting Optimal Glucose Control

At each visit, review blood glucose levels, including any laboratory tests and self-monitoring results. Ask the patient if they have had any episodes of hypoglycemia and what they did to alleviate them. Reinforce with the patient the need to perform blood glucose monitoring (usually four times a day, before meals and at bedtime) and to keep a record of the results. If appropriate, obtain a fingerstick blood glucose level to evaluate the accuracy of self-monitoring results. Also assess the patient's techniques for monitoring blood glucose levels and for administering insulin if ordered and offer support and guidance. If they are receiving insulin therapy, assist with any changes needed if glucose levels are not controlled. The goal is a fasting glucose level below 95 mg/dL and a 1-hour postprandial level below 140 mg/dL or a 2-hour postprandial level below 120 mg/dL (ElSayed et al., 2023). Obtain a urine specimen and check for glucose, protein, and ketones.

Preventing Complications

Assess the patient closely for signs and symptoms of complications at each visit. Anticipate possible complications and plan appropriate interventions or referrals. Check for blood pressure changes and evaluate for proteinuria when obtaining a urine specimen. These might suggest the development of preeclampsia. Measure the fundal height and review gestational age. Note any discrepancies between fundal height and gestational age or a sudden increase in uterine growth. These may suggest hydramnios.

Encourage the patient to perform daily fetal movement counts to monitor fetal well-being. Tell them specifically when to notify the health care provider. Also prepare the patient for the need for frequent laboratory and diagnostic testing to evaluate fetal status. Assist with serial ultrasounds to monitor fetal growth and with nonstress tests and biophysical profiles to assess fetal well-being.

CONSIDER THIS!

Scott and I had been busy all day setting up the new crib in our nursery, and we finally sat down to rest. I was due any day, and we had been putting this off until we had a long weekend to complete the task. I was excited to think about decorating my new daughter's room. I was sure that she would love it as much as I loved her already. A few days later, I barely noticed any fetal movement, but I thought that she must be as tired as I was by this point.

That night I went into labor and kept looking at the worried faces of the nurses and the midwife in attendance. I had been diagnosed with gestational diabetes a few months ago and had tried to follow the instructions regarding diet and exercise, but old habits are hard to change when you are 38 years old. I was finally told after a short time in the labor unit that they couldn't pick up a fetal heartbeat and an ultrasound was to be done; still no heartbeat was detected. Scott and I were finally told that our daughter was stillborn. All I could think about was that she would never get to see all the colors in the nursery.

Providing Patient Education and Counseling

The pregnant person with diabetes requires counseling and education about the need for strict glucose monitoring, diet and exercise, and signs and symptoms of complications. Encourage the patient and family to make any lifestyle changes needed to optimize the pregnancy outcome. At each visit, stress the importance of performing blood glucose screening and documenting the results. With proper instruction, the patient and family will be able to cope with all the changes in their body during pregnancy (Teaching Guidelines 20.1).

Instruct the patient about the benefits of breastfeeding related to blood glucose control. Breastfeeding helps normalize blood glucose level, so it should be encouraged. Also teach the person receiving insulin for diabetes that their insulin needs after birth will drastically decrease. People with gestational diabetes are at risk of developing type 2 diabetes and prediabetes in the postpartum period. Lactation is considered beneficial for maternal postpartum weight loss and control of glycemic metabolism, so it should be encouraged. Breastfeeding for more than 6 months reduces one's risk of recurrent gestational diabetes; a greater amount of breastfeeding in a lifetime decreases the risk of developing type 2 diabetes (Melov et al., 2022).

Review discussions about the timing of birth and the rationale. Counsel the patient about the possibility of cesarean birth for an infant who is large for gestational age (LGA). Inform the person who will be giving birth vaginally about the possible need for augmentation with oxytocin (Pitocin).

TAKE NOTE!

In the person with well-controlled diabetes, birth is typically not induced before term unless complications, such as preeclampsia or fetal compromise, arise. An early delivery date might be set for the person with poorly controlled diabetes or a large fetus who is having complications.

CARDIOVASCULAR DISEASE

Maternal heart disease has emerged as a major threat to cardiovascular health in pregnant people. Up to 4% of pregnant people may have cardiovascular complications despite a lack of previously diagnosed cardiac disease, and more than 25% of maternal deaths are attributed to CVD (American College of Obstetricians and Gynecologists [ACOG], 2022b). Pregnancy has profound effects on the cardiovascular system. These effects include increased cardiac output secondary to a 50% increase in intravascular volume, a decrease in blood pressure, and an increase in heart rate. Cardiac output is further

TEACHING GUIDELINES 20.1 Teaching for the Pregnant Person With Diabetes

- Be sure to keep your appointments for frequent prenatal visits and tests for fetal well-being.
- Perform blood glucose self-monitoring as directed, usually before each meal and at bedtime. Keep a record of your results and call your health care provider with any levels outside the established range. Bring your results to each prenatal visit.
- Perform daily fetal kick counts. Document them and report any decrease in activity.
- Drink eight to ten 8-oz glasses of water each day to prevent bladder infections and maintain hydration.
- Wear proper, well-fitted footwear when walking to prevent injury.
- Engage in a regular exercise program such as walking to aid in glucose control, but avoid exercising in temperature extremes.
- Consider breastfeeding your infant to lower your blood glucose levels.
- If you are taking insulin:
  - Administer the correct dose of insulin at the correct time every day.
  - Eat breakfast within 30 minutes after injecting regular insulin to prevent a reaction.
  - Plan meals at a fixed time and snacks to prevent extremes in glucose levels.
- Avoid simple sugars (cake, candy, cookies), which raise blood glucose levels.
- Know the signs and symptoms of hypoglycemia and the treatment needed:
  - Sweating, tremors, cold, clammy skin, headache
  - Feeling hungry, blurred vision, disorientation, irritability
  - Treatment: Drink 8 oz of milk and eat two crackers or take two glucose tablets.
  - Treatment: Carry "glucose boosters" (such as hard candies) to treat hypoglycemia.
- Know the signs and symptoms of hyperglycemia and the treatment needed:
  - Dry mouth, frequent urination, excessive thirst, rapid breathing
  - Feeling tired, flushed, hot skin, headache, drowsiness
  - Treatment: Notify your health care provider because hospitalization may be needed.
- Wear a diabetic identification bracelet at all times.
- Wash your hands frequently to prevent infections.
- Report any signs and symptoms of illness, infection, and dehydration to your health care provider, because these can affect blood glucose control.
- Remember, prevention is the best strategy for disease control!

affected in the third trimester by maternal positioning (Mohamad, 2022). The cardiovascular adaptations during pregnancy are well tolerated by the normal heart but may unveil undiagnosed underlying heart disease or tip the hemodynamic balance and lead to decompensation in those with existing heart disease. Pregnancy is a predictor of future cardiovascular health (Iftikhar & Biswas, 2023).

Congenital and Acquired Heart Disease

Congenital heart disease often involves structural defects that are present at birth but may not be discovered at that time (Table 20.3). Due to modern surgical techniques to correct these conditions, many people can complete a successful pregnancy at relatively low risk when appropriate counseling and optimal care are provided. Increasing numbers of people with complex congenital heart disease are reaching childbearing age. Complications such as growth restriction, preterm birth, newborn congenital heart defect, and fetal and neonatal mortality are more common among children of birthing parents with congenital heart disease (Waksmonski, 2023).

People with certain congenital conditions should avoid pregnancy. These include Fontan circulation for tetralogy of Fallot or transposition of the great arteries, bicuspid aortic valve stenosis with ascending aorta

TABLE 20.3 • Selected Heart Conditions Affecting Pregnancy

Condition	Description	Management
Congenital		
Atrial septal defect (ASD)	Congenital heart defect involving a communication or opening between the atria with left-to-right shunting due to greater left-sided pressure Arrhythmias present in some people	Treatment with atrioventricular nodal blocking agents and at times with electrical cardioversion
Ventricular septal defect (VSD)	Congenital heart defect involving an opening in the ventricular septum, permitting blood flow from the left to the right ventricle Complications include arrhythmias, heart failure, and pulmonary hypertension.	Rest with limited activity if symptomatic
Acquired		
Mitral valve prolapse	Very common in the general population, occurring most often in younger people Leaflets of the mitral valve prolapse into the left atrium during ventricular contraction The most common cause of mitral valve regurgitation if present during pregnancy Usually improvements in mitral valve function due to increased blood volume and decreased systemic vascular resistance of pregnancy; most people are able to tolerate pregnancy well.	Most people are without symptoms; diagnosis is made incidentally. Occasional palpitations, chest pain, or arrhythmias in some people, possibly requiring beta-blockers Usually, no special precautions are necessary during pregnancy.
Mitral valve stenosis	Most common chronic rheumatic valvular lesion in pregnancy Causes obstruction of blood flow from the atria to the ventricle, thereby decreasing ventricular filling and causing a fixed cardiac output Resultant pulmonary edema, pulmonary hypertension, and right ventricular failure In most pregnant people, this condition can be managed medically.	General symptomatic improvement with medical management involving diuretics, beta-blockers, and anticoagulant therapy Activity restriction, reduction in sodium, and potentially bed rest if the condition severe
Aortic stenosis	Narrowing of the opening of the aortic valve, leading to an obstruction to left ventricular ejection People with mild disease can tolerate hypervolemia of pregnancy; with progressive narrowing of the opening, cardiac output becomes fixed. Diagnosis can be confirmed with echocardiography. For most people, care can consist of medical therapy, bed rest, and close monitoring.	Diagnosis confirmed with echocardiography Pharmacologic treatment with beta-blockers and/or antiarrhythmic agents to reduce the risk of heart failure and/or dysrhythmias Bed rest/limited activity and close monitoring

TABLE 20.3 • Selected Heart Conditions Affecting Pregnancy (*continued*)

Condition	Description	Management
Peripartum cardiomyopathy	Rare congestive cardiomyopathy that may arise during pregnancy Multiparity, age, multiple fetuses, hypertension, an infectious agent, autoimmune disease, or cocaine use may contribute to its presence. Development of heart failure in the last month of pregnancy or within 5 months of giving birth without any preexisting heart disease or any identifiable cause	Preload reduction with diuretic therapy Afterload reduction with vasodilators Improvement in contractility with inotropic agents Nonpharmacologic approaches include salt restriction and daily exercise such as walking or biking. The question of whether another pregnancy should be attempted is controversial due to the high risk of repeat complications.
Myocardial infarction (MI)	Rare during pregnancy, but incidence is expected to increase as people become pregnant later in life and the risk factors for coronary artery disease become more prevalent. Factors contributing to MI include family history, stress, smoking, age, obesity, multiple fetuses, hypercholesterolemia, and cocaine use. Increased plasma volume and cardiac output during pregnancy increase the cardiac workload as well as the myocardial oxygen demands; imbalance in supply and demand may contribute to myocardial ischemia.	Usual treatment modalities for any acute MI along with consideration for the fetus Anticoagulant therapy, rest, and lifestyle changes to preserve the health of both parties

Cunningham, F. G., Leveno, K. J., Dashe, J. S., Hoffman, B. L., Spong, C. Y., & Casey, B. M. (2022b). Cardiovascular disorders. In F. G. Cunningham, K. J. Leveno, J. S. Dashe, B. L. Hoffman, C. Y. Spong, & B., M. Casey, *William's obstetrics* (26th ed.). McGraw Hill; Mohamad, T. N. (2022). Cardiovascular disease and pregnancy. *Medscape*. https://emedicine.medscape.com/article/162004-overview; and Iftikhar, S. F., & Biswas, M. (2023). Cardiac disease in pregnancy. *StatPearls*. https://www.ncbi.nlm.nih.gov/books/NBK537261/

diameter greater than 50 mm, and Marfan syndrome with aorta dilation greater than 45 mm (Waksmonski, 2023).

Acquired heart diseases are conditions affecting the heart and its associated blood vessels that develop during a person's lifetime. Acquired heart diseases include chronic hypertension, coronary artery disease, coronary heart disease, rheumatic heart disease, diseases of the pulmonary vessels and the aorta, diseases of the tissues of the heart, and diseases of the heart valves. Chronic hypertension is discussed in Chapter 19. Contraindications to pregnancy for people with acquired heart disease include severe arterial pulmonary hypertension of any cause, severe mitral stenosis, and severe systemic ventricular systolic dysfunction (Waksmonski, 2023) (see Table 20.3).

Many people are postponing childbearing until their 30s and 40s. With advancing maternal age, underlying medical conditions such as hypertension, diabetes, and hypercholesterolemia contributing to ischemic heart disease become more common and increase the incidence of acquired heart disease complicating pregnancy. Coronary artery disease and myocardial infarction may result (Cunningham et al., 2022b).

A person's ability to function during pregnancy is often more important than what the particular cardiovascular condition is and can be classified by risk. The risk categories are based on how much the patient is limited during physical activity, normal breathing, and varying degrees of shortness of breath and/or chest pain:

- *Risk Class I*: No detectable increased risk of maternal mortality and no increase or a mild increase in morbidity; prepregnancy/pregnancy counseling suggested. Select conditions under this classification might include pulmonic stenosis, patent ductus arteriosus, and mitral valve prolapse.
- *Risk Class II*: Small increased risk of maternal mortality or moderate increase in morbidity; prepregnancy/pregnancy counseling and cardiac consult every trimester. Select conditions under this classification include atrial or ventricular septal defect, repaired tetralogy of Fallot defects, and most arrhythmias.
- *Risk Classes II and III*: Intermediate increased risk of maternal mortality or moderate to severe increase in morbidity; prepregnancy/pregnancy counseling with a cardiologist consult every trimester. Delivery at appropriate level hospital. Select conditions include mild left ventricular impairment or hypertrophic cardiomyopathy.
- *Risk Class III*: Significantly increased risk of maternal mortality or severe morbidity; prepregnancy/pregnancy counseling, cardiologist consult every other month, prenatal care, and delivery at the appropriate level hospital. Select conditions in this classification include moderate left ventricular impairment, mechanical valve, moderate mitral stenosis, and ventricular tachycardia.
- *Risk Class IV*: Pregnancy contraindicated. Extremely high risk of maternal mortality or severe morbidity. Cardiac team consult and follow-up monthly (Iftikhar & Biswas, 2023).

The classification may change as the pregnancy progresses, and the pregnant person's body must cope with the increasing stress on the cardiovascular system resulting from the numerous physiologic changes taking place. Typically, a person with class I or II cardiac disease can go through a pregnancy without major complications. A person with class III disease needs frequent visits with the cardiac care team throughout pregnancy. A person with class IV disease should typically be advised to avoid pregnancy (Waksmonski, 2023). People with cardiac disease may benefit from preconception counseling so that they know the risks before deciding to become pregnant. Maternal mortality varies directly with the functional class at pregnancy onset.

Pathophysiology

Numerous hemodynamic changes occur in all pregnant people. These normal physiologic changes can overstress the cardiovascular system, increasing the risk for problems. Increased cardiac workload and greater myocardial oxygen demand during pregnancy place additional stress on the cardiovascular system, resulting in increased risk for morbidity and mortality.

TAKE NOTE!

Uterine blood flow increases by at least 1 L/min, requiring the body to produce more blood during pregnancy. This results in a 25% increase in red blood cells (RBCs), a 50% expansion of plasma volume during pregnancy, and an overall hemodilution. In addition, the increase in total red blood cellular volume includes an increase in clotting factors and platelets, defining the hypercoagulable state of pregnancy (Cunningham et al., 2022a). These changes start as early as the second month of gestation.

Normal physiologic changes are important for a successful adaptation to pregnancy but create unique physiologic challenges for the patient with cardiac disease (Comparison Chart 20.1).

Therapeutic Management

Ideally, a person with a history of congenital or acquired heart disease should consult their health care provider and undergo a risk assessment before becoming pregnant. This risk assessment must consider the person's functional capacity, exercise tolerance, degree of cyanosis, medication needs, and history of arrhythmias. The impact of heart disease on a person's childbearing potential needs to be clearly explained, and providing information on how pregnancy may affect them and the fetus is important. This allows people to make an informed choice about whether they wish to accept the risks associated with pregnancy. When possible, any surgical procedures, such as valve replacement, should be done before pregnancy to improve fetal and maternal outcomes (Cunningham et al., 2022b).

If the patient presents for care after becoming pregnant, prenatal counseling focuses on the impact of the hemodynamic changes of pregnancy, the signs and symptoms of cardiac compromise, and dietary and lifestyle changes needed. More frequent prenatal visits (every 2 weeks until the last month and then weekly) are usually needed to ensure the health and safety of the pregnant person and fetus.

COMPARISON CHART 20.1 Cardiovascular Changes: Prepregnancy Versus Pregnancy

Measurement	Prepregnancy	Pregnancy
Heart rate	72 (±10 bpm)	+10%–20%
Cardiac output	4.3 (±0.9 L/min)	+30%–50%
Blood volume	5 L	+20%–50%
Stroke volume	73.3 (±9 mL)	+30%
Systemic vascular resistance	1,530 (±520 dyne/cm/sec)	–20%
Oxygen consumption	250 mL/min	+20%–30%

Cunningham, F. G., Leveno, K. J., Dashe, J. S., Hoffman, B. L., Spong, C. Y., & Casey, B. M. (2022a). Maternal physiology. In F. G. Cunningham, K. J. Leveno, J. S. Dashe, B. L. Hoffman, C. Y. Spong, & B., M. Casey, *William's obstetrics* (26th ed.). McGraw Hill; and Iftikhar, S. F., & Biswas, M. (2023). Cardiac disease in pregnancy. *StatPearls*. https://www.ncbi.nlm.nih.gov/books/NBK537261/

Nursing Assessment

Explore the patient's history. The key risk factors linked to CVD-related maternal morbidity and mortality include race/ethnicity (higher risk in non-Hispanic Black people vs. non-Hispanic White people), age (older than 40 years), hypertension, obesity (BMI ≥30), cigarette smoking, and hypercholesterolemia (American Heart Association, 2022). Frequent and thorough assessments are crucial during the antepartum period to ensure early detection of and prompt intervention for problems. Assess vital signs, noting any changes. Auscultate the apical heart rate and heart sounds, being especially alert for abnormalities, including rhythm irregularities or murmurs. Check the patient's weight and compare it with baseline and weights obtained on previous visits. Report any weight gain outside the expected parameters. Inspect the extremities for edema and note any pitting.

Question the patient about fetal activity and ask if they have noticed any changes. Report any changes such as a decrease in fetal movements. Ask the patient about

any symptoms of preterm labor, such as low back pain, uterine contractions, increased pelvic pressure, and vaginal discharge, and report them immediately. Assess the fetal heart rate and review serial ultrasound results to monitor fetal growth.

Assess the patient's lifestyle and their ability to cope with the changes of pregnancy and its effect on cardiac status and ability to function. Evaluate the patient's understanding of their condition and what restrictions and lifestyle changes may be needed to provide the best outcome for them and their fetus. A healthy infant and birthing parent at the end of pregnancy is the ultimate goal. As the patient's pregnancy advances, expect their functional class to be revised based on their level of disability. Suggest realistic modifications.

The nurse plays a major role in recognizing the signs and symptoms of cardiac decompensation. Decompensation refers to the heart's inability to maintain adequate circulation. As a result, tissue perfusion in the pregnant person and the fetus is impaired. Common complaints of normal pregnancy, such as dyspnea, fatigue, palpitations, orthopnea, and pedal edema, mimic symptoms of worsening cardiac disease and create challenges when trying to evaluate pregnant people with cardiac disease.

TAKE NOTE!

Assessing the pregnant person with heart disease for cardiac decompensation is vital because their hemodynamic status impacts the health of the fetus.

Nursing Management

Nursing care for the pregnant person with heart disease focuses on assisting with measures to stabilize their hemodynamic status because a decrease in maternal blood pressure or volume will cause blood to be shunted away from the uterus, thus reducing placental perfusion. Pregnant people with cardiac disease also need assistance in reducing risks that would lead to complications or further cardiac compromise; therefore, education and counseling are critical. Collaboration between the cardiologist, obstetrician, perinatologist, and nurse is needed to promote the best possible outcome.

Drug therapy may be indicated for the pregnant person with a cardiac disorder. Possible drugs include diuretics such as furosemide to prevent heart failure, digitalis to increase contractility and decrease heart rates, antiarrhythmic agents (lidocaine), beta-blockers (labetalol), or calcium channel blockers (nifedipine) to treat hypertension, and anticoagulants (low-molecular-weight heparin). Warfarin (Coumadin) is not recommended because it crosses the placenta and may have teratogenic effects (UpToDate, Inc., 2024).

The U.S. Food and Drug Administration (FDA) is no longer using drug categories A, B, C, D, and X. The package inserts include three separate categories that provide information in a narrative format. The goal of this labeling is to provide information about the drug to the consumer. They now use specific subheadings under each of the three categories: pregnancy, lactation, and females and males of reproductive potential.

Encourage the patient to continue taking their cardiac medications as prescribed. Review the indications, actions, and potential side effects of the medications. Reinforce the importance of frequent prenatal visits and close medical supervision throughout the pregnancy.

Discuss the need to conserve energy. Help the patient prioritize household chores and child care to allow rest periods. Encourage the patient to rest in the side-lying position, which enhances placental perfusion.

Encourage the patient to eat nutritious foods and consume a high-fiber diet to prevent straining and constipation. Discuss limiting sodium intake if indicated to reduce fluid retention. Contact a dietitian to assist the patient in planning nutritionally appropriate meals.

Assist the patient in preparing for diagnostic tests to evaluate fetal well-being. Describe the tests that may be done, such as electrocardiogram (ECG), and explain the need for serial nonstress testing, usually beginning at approximately 32 weeks' gestation. Instruct the patient on how to monitor fetal activity and movements. Urge them to do this daily and report any changes in activity immediately.

Although the morbidity and mortality rates of pregnant people with cardiac disease have decreased greatly, hemodynamic changes during pregnancy (increased heart rate, stroke volume, cardiac output, and blood volume) have a profound effect, which may increase cardiac work and might exceed the functional capacity of the diseased heart. These changes may result in pulmonary hypertension, pulmonary edema, heart failure, or maternal death (Iftikhar & Biswas, 2023). Explain the signs and symptoms of these complications and review the signs and symptoms of cardiac decompensation, encouraging the patient to notify their health care provider if any occur.

Provide support and encouragement throughout the prenatal period. Assess the support systems available to the patient and family and encourage their use. If necessary, assist with referrals to community services for additional support.

ASTHMA

During pregnancy, the respiratory system is affected by hormonal changes, mechanical changes, and prior respiratory conditions. These changes can cause a patient with a history of compromised respiration to decompensate during pregnancy. Chronic respiratory conditions such as asthma can have a negative effect on the growing fetus when alterations in oxygenation occur in the pregnant

person. The outcome of pregnancy in a person with asthma depends on the severity of the oxygen alteration as well as the degree and duration of hypoxia in the fetus.

Asthma

Worldwide, the prevalence of asthma among pregnant people is on the rise. Pregnancy leads to a worsening of asthma for about one third of people. Another third will remain unchanged, while the last third will see their symptoms improve (American Academy of Allergy Asthma & Immunology, 2023). Asthma affects up to 8% of pregnancies and is associated with an increased risk of preeclampsia, fetal growth restriction, preterm birth, low birth weight, and maternal and fetal mortality (Shebl & Chakraborty, 2023). As asthma severity increases, the risks also increase.

Remember Rose, the pregnant adolescent with asthma in acute distress described at the beginning of the chapter? What therapies might be offered to control her symptoms? Should she be treated differently than someone who is not pregnant? Why or why not?

Pathophysiology

Asthma is a chronic inflammatory response of the respiratory tract to various stimuli such as allergens (pollen and animal dander), irritants (cigarette smoke and chemicals), stress, infections (colds or flu), and physical exertion. The bronchioles constrict in response to these stimuli. Asthma is characterized by intermittently recurrent or persistent symptoms of bronchoconstriction, including breathlessness, wheezing, chest tightness, cough, and sputum production. In addition to bronchoconstriction, inflammation of the airways occurs and tenacious mucus is produced, limiting air movement and making ventilation difficult (Cunningham et al., 2022c).

The normal physiologic changes of pregnancy affect the respiratory system. Although the respiratory rate does not change, vital capacity and inspiratory capacity increase by 20% by late pregnancy. Diaphragmatic elevation and a decrease in functional lung residual capacity occur late in pregnancy, which may reduce the person's ability to inspire deeply to take in more oxygen. Both oxygen consumption and the metabolic rate increase, placing additional stress on the respiratory system (Cunningham et al., 2022c).

Therapeutic Management

The primary goal of asthma management during pregnancy is to maintain adequate oxygenation of the fetus by preventing hypoxic episodes in the parent. The management of asthma focuses on the prevention of airway inflammation to avoid airway hyperresponsiveness and an exacerbation of asthma symptoms. Treatment is the same as that of a person who is not pregnant (Shebl & Chakraborty, 2023). The mainstay of asthma control is avoidance of allergens or triggers. A stepwise approach is used to prevent and manage symptoms with inhaled corticosteroids and bronchodilators. When asthma symptoms worsen or are poorly controlled, treatment is stepped up to the next level.

Nursing Assessment

Obtain a thorough history of the patient's experience with asthma, including the usual therapy and control measures. Question the patient about asthma triggers and strategies used to reduce exposure to them. Review the patient's medication therapy regimen.

Note the patient's skin color (use the palms, soles, or mucosa to determine color in people with dark skin). Determine the heart rate, which may be elevated with an asthma exacerbation. Auscultate the lungs and assess respiratory and heart rates. Note the rate, rhythm, and depth of respirations, listening for a tight cough. Auscultate the lungs, which should be clear between episodes. During an acute exacerbation, wheezing and dyspnea may be noted (Lange-Vaidya, 2023). Assess the fetal heart rate.

CLINICAL REASONING ALERT!

Tachycardia, tachypnea, and a prolonged expiratory phase are indicators of the severity of an asthma exacerbation.

Nursing Management

Nursing management focuses on reinforcing asthma management with the patient. The asthma maintenance plan is individualized for each patient by the primary care provider or pulmonologist. Reinforce the importance of optimal asthma control. Observe the patient demonstrating the use of the inhaler to ensure its correct use. Offer resources such as smoking cessation programs and home environmental allergy controls. Ensure the pregnant patient understands concerning symptoms and who to contact in an emergency. Review potential perinatal complications with the patient to motivate them to adhere to the prescribed regimen.

Rose, the pregnant patient described earlier, is concerned about passing her asthma on to her baby. What should the nurse discuss with her?

HEMATOLOGIC CONDITIONS

Anemia, a reduction in RBC volume, is measured by hematocrit (Hct) or a decrease in the concentration of hemoglobin (Hgb) in the peripheral blood. This results in

reduced capacity of the blood to carry oxygen to the vital organs of the pregnant person and the fetus. Anemia may be caused by nutrient deficiencies or a genetic hemoglobinopathy. Anemia during pregnancy is generally defined as an Hgb below 11 g/dL in the first and third trimesters, and below 10.5 g/dL in the second trimester (Auerbach & Landy, 2023).

Iron-Deficiency Anemia

In North and South America, about 19% of patients experience anemia during pregnancy; iron deficiency is the most common cause (Auerbach & Landy, 2023). Increased risk for iron deficiency during pregnancy is related to increased maternal blood volume, expanded maternal erythrocyte mass, and iron needs for fetal/placental growth and fetal erythrocyte production (Auerbach & Landy, 2023). A person who is pregnant often has insufficient iron stores to meet the demands of pregnancy. Iron-deficiency anemia accounts for most of the cases of anemia in pregnant people; it is usually related to an iron-deficient diet, gastrointestinal issues affecting absorption, or a short pregnancy interval (Auerbach & Landy, 2023).

Pregnant patients with iron-deficiency anemia are twice as likely to experience severe maternal morbidity and have an increased risk of preeclampsia, cesarean delivery, infection, and postpartum hemorrhage (Auerbach & Landy, 2023). Adequate iron is required for normal fetal brain development; maternal iron deficiency places the newborn at risk for neurodevelopmental sequelae (Auerbach & Landy, 2023).

Therapeutic Management

The goals of treatment for iron-deficiency anemia in pregnancy are to eliminate symptoms, correct the deficiency, and replenish iron stores. Screening for anemia with Hgb and Hct should occur at the first prenatal visit and again at 24 to 28 weeks' gestation. The first-line treatment is oral iron. The supplement ferrous sulfate may be given once or twice daily or on alternate days (which improves absorption and decreases side effects) (Auerbach & Landy, 2023).

Nursing Assessment

Review the patient's history for factors that may increase the risk for the development of iron-deficiency anemia, including poor nutrition, hemolysis, multiple gestation, limited intervals between pregnancies, and blood loss. Assess dietary intake as well as the quantity and timing of ingestion of substances that interfere with iron absorption, such as tea, coffee, chocolate, and high-fiber foods. Ask the patient if they have fatigue, weakness, malaise, anorexia, or symptoms of restless leg syndrome. Inspect the skin and mucous membranes, noting any pallor. Obtain vital signs and report any tachycardia.

> **TAKE NOTE!**
>
> Hgb and Hct decrease normally during pregnancy in response to an increase in blood plasma in comparison to RBCs. This hemodilution can lead to physiologic anemia of pregnancy, which does not indicate a decrease in oxygen-carrying capacity or true anemia.

Nursing Management

Nursing care of the person with iron-deficiency anemia focuses on encouraging adherence to iron drug therapy and providing dietary instruction about the intake of iron-rich foods. Stress the importance of taking prenatal vitamins, which contain 27 mg/day of iron, and (if prescribed) an iron supplement consistently. Encourage the patient to take the iron supplement with vitamin C–containing fluids such as orange juice, which will promote absorption, rather than milk, which can inhibit iron absorption. Taking iron on an empty stomach improves its absorption, but many people cannot tolerate the gastrointestinal discomfort it causes. In such cases, advise the patient to take it with meals. Instruct them about adverse effects, which are predominantly gastrointestinal and include abdominal pain, nausea, metallic taste, black stool, and constipation. Provide dietary counseling for increasing intake of iron-containing foods. Teaching Guidelines 20.2 highlights instructions for the pregnant person with iron-deficiency anemia.

TEACHING GUIDELINES 20.2 Teaching for the Person With Iron-Deficiency Anemia

- Take your prenatal vitamin daily; if you miss a dose, take it as soon as you remember.
- For best absorption, take iron supplements between meals and with orange juice.
- Be aware of the side effects of iron supplementation.
- Avoid taking iron supplements with coffee, tea, chocolate, and high-fiber foods.
- Eat foods rich in iron, such as:
  - Meats, green leafy vegetables, legumes, dried fruits, whole grains
  - Peanut butter, bean dip, whole-wheat fortified breads, and cereals
- For best iron absorption from foods, consume the food along with a food high in vitamin C.
- Increase your exercise, fluids, and high-fiber foods to reduce constipation.
- Plan frequent rest periods during the day.

Hemoglobinopathies

Sickle cell disease (SCD) and thalassemia are two hereditary hemoglobinopathies that result in anemia. SCD is an autosomal recessive inherited condition resulting in a defective hemoglobin molecule (hemoglobin S). The normal donut-shaped RBC is replaced with a rigid, sickle-shaped cell that has difficulty passing through small blood vessels, obstructing blood flow. The typical lifespan of sickled RBCs is approximately 15 days, compared to the 120-day lifespan of normal RBCs. Consequently, people with sickle cell anemia suffer from moderate to severe anemia. Beta thalassemia major is an autosomal recessive condition in which the beta chain of the hemoglobin molecule is defective, leading to hemolysis and resulting in significant anemia. It also results in hemochromatosis (excess iron deposition in the tissues and organs). People who have only one gene for SCD or thalassemia are carriers of the disease; carrier status has little effect on pregnancy.

> *TAKE NOTE!*
>
> Because of their association with iron overload, iron supplements are contraindicated in beta thalassemia major.

SCD during pregnancy is associated with more severe anemia and frequent vaso-occlusive crises resulting in increased perinatal morbidity and mortality including venous and arterial thromboembolism, infection, preeclampsia, eclampsia, cesarean birth, fetal growth restriction, low birth weight, and preterm birth (James & Oppong, 2023). It is recommended that low-dose aspirin be given after 12 weeks' gestation to prevent preeclampsia (ACOG et al., 2022). Hydroxyurea is routinely used for the management of SCD and may or may not be continued during pregnancy depending upon SCD severity. Prenatal vitamins should not contain iron, and higher doses of folic acid may be helpful. Analgesics will be needed during vaso-occlusive crises (James & Oppong, 2023).

The mainstay of treatment for beta thalassemia major is blood transfusion and ongoing iron chelation therapy. A person with beta thalassemia major is able to carry a fetus to term if they have a normal cardiac evaluation and have participated in chronic blood transfusion with iron chelation. The need for blood transfusions to maintain hemoglobin greater than 10 mg/dL will likely increase during pregnancy due to increased intravascular volume. Iron chelation is not advised during pregnancy due to its possible teratogenic effects (Benz & Angelucci, 2024).

Nursing Assessment

Early and continuous prenatal care of the patient with a hemoglobinopathy is needed to safeguard the fetus or newborn from potential complications. Explore the patient's health history for usual medications for SCD and a regular schedule of blood transfusions for beta thalassemia major. Ask the patient if they have fatigue, malaise, or dyspnea. Inspect the color of the skin and mucous membranes, noting any pallor. Assess hydration status. Note palpitations or tachycardia. Be alert for indicators of sickle cell vaso-occlusive crisis including leg, digit, or joint pain and chest or abdominal pain (Mangla et al., 2023). Monitor hemoglobin and ferritin levels frequently. Assess the fetal heart rate at each visit.

Nursing Management

Prenatal visits during the first and second trimesters should occur more frequently. Nurses should provide supportive care and expectant management throughout the pregnancy. In the presence of anemia, instruction to rest and to avoid infections is helpful. Urge the patient to drink eight to 10 glasses of fluid daily to prevent dehydration. Teach the patient about the need to avoid infections (including meticulous hand hygiene), cigarette smoking, alcohol consumption, and temperature extremes.

Predicting the clinical course of SCD or beta thalassemia during pregnancy is difficult. Outcomes have improved for pregnant people with hemoglobinopathy. Optimal management during pregnancy requires a multidisciplinary team and prompt, effective treatment of potential complications if they occur.

SELECTED MUSCULOSKELETAL AND AUTOIMMUNE DISORDERS

Musculoskeletal disorders often involve pain and are frequently treated with teratogenic medications. Autoimmune disorders are a group of more than 100 distinct diseases that emerge when the immune system launches an immune response against its own cells and tissues. It is thought that a genetic predisposition, environmental triggers, and hormones all contribute to disease development and activity. A greater number of autoimmune-related genes originate from the X chromosome, which creates a far greater possibility of mutations occurring (Angum et al., 2020). This places people with two X chromosomes at a greater risk for developing autoimmune diseases than those with only one. Of people affected by autoimmune diseases, approximately 80% are female. Previously, the general advice to people with autoimmune diseases was to avoid pregnancy because there was a high risk of maternal and fetal morbidity and mortality. However, it is now clear that these risks can generally be reduced by avoiding pregnancy when the diseases are active and continuing appropriate medication to reduce the chances of disease flare during pregnancy. At times considered an autoimmune disease, multiple sclerosis (MS) is likely an

immune response to a viral trigger (Olek & Mowry, 2024). MS will be included in this discussion.

Pregnancies in people with an autoimmune disease may be considered high risk. At each prenatal visit, fetal well-being and growth must be assessed. Complications related to pregnancy with each disease are:

- Systemic lupus erythematosus (SLE): preeclampsia, eclampsia, preterm labor, unplanned cesarean delivery, fetal growth restriction (Bermas & Smith, 2023)
- Poorly controlled rheumatoid arthritis (RA): hypertensive disorders, fetal growth restriction, cesarean delivery (Bermas, 2023)
- Fibromyalgia: cesarean delivery (Koné et al., 2022)

The exception to complications in pregnancy is MS. Pregnancy seems to decrease MS relapses. Refer to Table 20.4 for an explanation of selected autoimmune and immune diseases and their therapeutic management and nursing implications.

TABLE 20.4 • Selected Musculoskeletal and Autoimmune Diseases

Disease and Explanation	Clinical Manifestations	Therapeutic Management	Nursing Implications
Musculoskeletal Diseases			
Multiple sclerosis—chronic inflammatory, demyelinating autoimmune disorder of the central nervous system	• Sensory loss in the face or limbs • Motor and gait disturbances • Balance issues, vertigo • Diplopia, vision loss • Bladder problems • Pain	Disease-modifying therapy (DMT) medications such as interferon and monoclonal antibodies	• In nonsevere cases of MS, DMTs should be stopped prior to conception. • Educate the patient to eat a balanced diet, avoid alcohol and smoking, take vitamin D and prenatal vitamins, and prioritize sleep hygiene.
Fibromyalgia—central pain sensitivity syndrome without joint damage	• Brain fog • Depression • Fatigue • Widespread musculoskeletal and other body pain	Pregabalin, duloxetine, and milnacipran	• Educate the patient about relaxation techniques, sleep hygiene, and the importance of exercise. • Duloxetine, milnacipran, and pregabalin cross the placenta. • If duloxetine or milnacipran are to be discontinued, they should be tapered rather than abruptly stopped.
Autoimmune Diseases			
Systemic lupus erythematosus (SLE)—chronic, relapsing autoimmune disease of the connective tissues affecting various organs (skin, joints, kidneys, serosal membranes)	• Swollen joints • Extreme fatigue • Oral ulcers • Fever • Skin rashes • Sensitivity to sunlight	Anti-inflammatory drugs and hydroxychloroquine (Plaquenil) are used to manage disease flares activated by estrogen, cigarette smoking, infections, stress, ultraviolet light exposure, or pregnancy.	• Recommend postponing conception until the disease has been stable or in remission for 6 months. • Assess for SLE signs and symptoms, urine for protein and specific gravity, and signs of infection. • Teach to monitor for flare symptoms and educate on energy conservation techniques.
Rheumatoid arthritis (RA)—joint inflammation (primarily synovial joints, tissues of the hands and feet) resulting in disability	• Painful joints • Loss of function • Joint deformity • Stiffness with inactivity • Decreased mobility	Anti-inflammatory drugs, glucocorticoids, DMT medications, methotrexate	• Educate to discontinue DMT drugs upon conception and methotrexate prior to conception. • Encourage physical activity within the limits of joint pain (swimming is excellent). • Advise about increased risk of disease flare in the postpartum period.

Bermas, B. L. (2023). Rheumatoid arthritis and pregnancy. *UpToDate*. Retrieved May 3, 2024, from https://www.uptodate.com/contents/rheumatoid-arthritis-and-pregnancy; Bermas, B. L., & Smith, N. A. (2023). Pregnancy in women with systemic lupus erythematosus. *UpToDate*. Retrieved May 3, 2024, from https://www.uptodate.com/contents/pregnancy-in-women-with-systemic-lupus-erythematosus; Bhargava, J., & Hurley, J. A. (2023). Fibromyalgia. *StatPearls*. https://www.ncbi.nlm.nih.gov/books/NBK540974/; Lee, M. J., Sullivan, C., & Graves, J. (2023). Multiple sclerosis: Pregnancy planning. *UpToDate*. Retrieved May 3, 2024, from https://www.uptodate.com/contents/multiple-sclerosis-pregnancy-planning; Olek, M. J., & Howard, J. (2024). Clinical presentation, course, and prognosis of multiple sclerosis in adults. *UpToDate*. Retrieved May 3, 2024, from https://www.uptodate.com/contents/clinical-presentation-course-and-prognosis-of-multiple-sclerosis-in-adults; UpToDate, Inc. (2024). *UpToDate® Lexidrug™* (Version 8.2.0) [Mobile app]. Wolters Kluwer. https://apps.apple.com/us/app/lexicomp/id313401238; and Wallace, D. J., & Gladman, D. D. (2023). Clinical manifestations and diagnosis of systemic lupus erythematosus in adults. *UpToDate*. Retrieved May 3, 2024, from https://www.uptodate.com/contents/clinical-manifestations-and-diagnosis-of-systemic-lupus-erythematosus-in-adults

INFECTIONS

A wide variety of infections can affect the progression of pregnancy, possibly negatively impacting the outcome. The effect of the infection depends on the timing and severity of the infection and the body systems involved. Common viral infections include cytomegalovirus (CMV), rubella, herpes simplex, hepatitis B, varicella, and parvovirus B19. Group B streptococcus (GBS), toxoplasmosis, and tuberculosis (TB) are common nonviral infections. Sexually transmitted infections (STIs) may be bacterial or viral. STIs are discussed in detail in Chapter 5. Refer to Table 20.5 for information relating to STIs during pregnancy.

TABLE **20.5** • Sexually Transmitted Infections (STIs) Affecting Pregnancy

Infection/Organism	Effect on Pregnancy and Fetus/Newborn	Implications
Herpes simplex virus (HSV)	Highest risk of transmission is with infection onset near the time of birth and vaginal birth with active lesions. Newborn infection may be localized or disseminated (high risk of mortality).	Antiviral agents during pregnancy may decrease the transmission rate. Avoid procedures causing a break in the infant's skin, such as artificial rupture of membranes, fetal scalp electrode, forceps, and vacuum extraction. Cesarean delivery indicated if active lesions noted at the time of birth
Syphilis (*Treponema pallidum*)	Maternal infection increases the risk of premature labor and birth. Newborn may be born with congenital syphilis, causing jaundice, rhinitis, anemia, fetal growth restriction, and central nervous system involvement.	All pregnant people should be screened for this STI and treated with benzathine penicillin G 2.4 million units IM to prevent placental transmission.
Gonorrhea (*Neisseria gonorrhea*)	Majority of people are without symptoms. It causes ophthalmia neonatorum in the newborn from birth through infected birth canal.	All pregnant people should be screened at the first prenatal visit with repeat screening in the third trimester. All newborns receive mandatory eye prophylaxis with erythromycin within the first hour of life. Birthing parent is treated with ceftriaxone (Rocephin) 125 mg IM in a single dose before going home.
Chlamydia (*Chlamydia trachomatis*)	Majority of people are without symptoms. Infection is associated with infertility and ectopic pregnancy, spontaneous abortions, preterm labor, premature rupture of membranes, low birth weight, stillbirth, and neonatal mortality. Infection is transmitted to the newborn through vaginal birth. Neonate may develop conjunctivitis or pneumonia.	All pregnant people should be screened at the first prenatal visit and treated with erythromycin.
Human papillomavirus (HPV)	Infection causes warts in the anogenital area, known as condylomata acuminata. These warts may grow large enough to block a vaginal birth. Fetal exposure to HPV during birth is associated with laryngeal papillomas.	Warts are treated with trichloroacetic acid, liquid nitrogen, or laser therapy under colposcopy. Two HPV vaccines have been FDA-approved and are licensed in the United States for people 9–45 years old, with recommended vaccination beginning at age 9. The vaccines are 95%–100% effective.
Trichomonas (*Trichomonas vaginalis*)	Infection produces itching and burning, dysuria, strawberry patches on the cervix, and vaginal discharge. Infection is associated with premature rupture of membranes and preterm birth.	Treatment is with a single 2-g dose of metronidazole (Flagyl).

FDA, U.S. Food and Drug Administration; IM, intramuscularly.

Cunningham, F. G., Leveno, K. J., Dashe, J. S., Hoffman, B. L., Spong, C. Y., & Casey, B. M. (2022e). Sexually transmitted infections. In F. G. Cunningham, K. J. Leveno, J. S. Dashe, B. L. Hoffman, C. Y. Spong, & B., M. Casey, *William's obstetrics* (26th ed.). McGraw Hill.

Cytomegalovirus

CMV is a member of the herpesvirus family and infects between 50% and 80% of the human population by age 40 (Cedeno-Mendoza, 2023). It is transmitted via body fluids such as saliva, urine, semen, vaginal fluids, blood, tears, and breast milk and can also pass through the placenta during pregnancy. Pregnant people acquire active disease primarily from sexual contact, blood transfusions, kissing, and contact with children in day care centers. CMV is typically without symptoms in most people, though it may cause influenzalike symptoms in some. Acute infection during pregnancy may lead to fetal growth restriction or an infant who is small for gestational age (SGA).

Prenatal screening for CMV infection is not routinely performed. In infants of previously seronegative birthing parents who acquire CMV infection during pregnancy, in utero fetal infection may occur. Between 10% and 15% of congenitally infected infants are acutely symptomatic at birth, displaying a blueberry muffin rash, central nervous system anomalies, jaundice, and hepatosplenomegaly (Fig. 20.3) (Plotogea et al., 2022). Congenital CMV infection often results in deafness and neurodevelopmental disabilities. There is no proven in utero treatment for infected fetuses (Plotogea et al., 2022).

Stressing the importance of good hand hygiene and the use of sound hygiene practices can help to reduce transmission of the virus. A few specific hygiene guidelines for pregnant people include:

- Wash hands frequently with soap and water and wear gloves, especially after diaper changes, feeding, wiping nose or drool, and handling children's toys.
- Do not share cups, plates, utensils, food, or toothbrushes.
- Do not share towels or washcloths.
- Avoid contact with tears and saliva when kissing a child.
- Do not put a child's pacifier in your mouth.
- Clean toys, countertops, and other surfaces that come in contact with children's urine or saliva.
- Practice safe sex, including limiting sexual partners and using condoms consistently.

FIGURE 20.3 Clinical appearance of an infant with congenital cytomegalovirus with stigmata of disease, including petechial rash, microcephaly, jaundice, and abnormal posture of upper extremities secondary to central nervous system damage.

Rubella

Rubella, commonly called German measles, is a vaccine-preventable infection spread by droplets or through direct contact with a contaminated object (Edwards & Shetty, 2023). The risk of a pregnant person transmitting this virus through the placenta to the fetus increases with earlier exposure to the virus. The highest risk of transmission occurs when the pregnant person becomes infected within the first 10 weeks of gestation (Arrieta, 2023). Congenital rubella infection may result in spontaneous abortion or stillbirth. The newborn may have sensorineural hearing loss (most common); congenital cataracts or glaucoma; congenital heart defects; and later in life, developmental delay (Arrieta, 2023).

Education for primary prevention is the key. Ideally, everyone has been vaccinated and has adequate immunity against rubella. However, all patients are still screened at their first prenatal visits to determine their immune status. A rubella antibody titer of 1:8 or greater provides evidence of immunity. People who are not immune should be vaccinated during the immediate postpartum period so that they will be immune before becoming pregnant again (Riley, 2024).

Hepatitis B and C Virus

Hepatitis B virus (HBV) is one of the most prevalent chronic diseases in the world. Since 1998, rates of hepatitis B infection in pregnant people have increased by over 5% annually (Pressman & Ros, 2023). In the United States, the prevalence of chronic hepatitis B infection among pregnant people is approaching 1% (Asafo-Agyei & Samant, 2023). HBV can be transmitted through sexual contact, illicit drug use, and contaminated blood; sexual transmission accounts for most adult HBV infections. Hepatitis C virus (HCV) infection is becoming increasingly more prevalent during pregnancy, likely due to injectable drug use (Pressman & Ros, 2023). Both acute and chronic HBV and HCV infection may be vertically transmitted to the infant.

People with acute HBV and HCV infection may be completely without symptoms or may experience malaise, right upper quadrant abdominal pain, nausea, anorexia, jaundice, and dark urine (Asafo-Agyei & Samant, 2023; Feld, 2022). Both HBV and HCV may cause chronic infection, which is generally without symptoms. Maternal HBV and HCV infection increases the risk of preterm birth and neonatal death (Asafo-Agyei & Samant, 2023; Chen et al., 2023). Additionally, chronic HBV infection

during pregnancy increases the risk for maternal death, fetal growth restriction, gestational hypertension, placental abruption, and preterm birth (Asafo-Agyei & Samant, 2023). With chronic HBV, if the hepatitis B surface antigen (HBsAg) is positive, the vertical transmission rate is 90% (Asafo-Agyei & Samant, 2023). The vertical transmission rate for HCV is almost 6% (with an increased rate of transmission for those also infected with HIV) (Goldman & O'Donovan, 2023).

Nursing Assessment

The ACOG (2023) recommends hepatitis B and hepatitis C screening at the first prenatal visit. HBsAg should also be evaluated.

Nursing Management

Pregnant people with a high viral load for hepatitis B may be treated with antivirals after 28 to 32 weeks of gestation to decrease the vertical transmission rate to 5% (Asafo-Agyei & Samant, 2023). People who are HBsAg-negative may be vaccinated safely during pregnancy, with the hepatitis B vaccine series given as two injections, 5 months apart. To decrease vertical transmission in people positive for hepatitis C, it is recommended to avoid cesarean birth if at all possible.

Patient education related to the prevention of HBV and HCV is essential. Teach the patient about safer sex practices, good hand hygiene techniques, and the use of standard precautions. All pregnant people should avoid injectable drug misuse.

Varicella Zoster Virus

Varicella zoster virus (VZV) is one of the eight herpes family viruses. It is the virus that causes both varicella (chickenpox) and herpes zoster (shingles). Primary VZV leads to varicella and establishes latency in the dorsal root ganglia. Reactivation of VZV causes herpes zoster. Herpes zoster can occur once the immune response against the virus wanes, usually with advancing age.

Due to prior immunity resulting from chickenpox in childhood or immunization series completion, pregnant people rarely develop varicella infection (Speer, 2023). When a seronegative person contracts varicella infection 2 to 5 days before delivery, the newborn fatality rate is 30% (Speer, 2023). If hospitalized, a seronegative pregnant person who is exposed to an active varicella infection 6 to 21 days before delivery must be isolated to prevent transmission to others. The newborn may stay in the birthing parent's room but should not be admitted to the nursery to prevent possible transmission to other infants.

If the birthing parent has signs and symptoms of varicella infection within 2 to 5 days of delivery, the newborn should receive varicella zoster immunoglobulin (Varizig) intramuscularly shortly after birth (Speer, 2023). Varicella infection can be prevented by appropriate immunization with the vaccine in people testing nonimmune to varicella. As a live vaccine, varicella immunization is contraindicated in pregnancy but should be given to seronegative people before or after pregnancy (Centers for Disease Control and Prevention [CDC], 2022a).

Parvovirus B19

Parvovirus B19 is a common, self-limiting, benign childhood virus that causes erythema infectiosum. It is estimated that 30% to 60% of adults have been infected previously with parvovirus (Riley & Fernandes, 2023). Parvovirus B19 is commonly called fifth disease and is transmitted by respiratory secretions or saliva, close person-to-person contact, and fomites (Jordan, 2023). Most infected people are without symptoms, though young children are most commonly infected and present with a slapped cheek appearance and lacy erythematous rash on the trunk and extremities (Riley & Fernandes, 2023). Infection usually results in lasting immunity. Fetal infection may be associated with a normal outcome; however, fetal death or fetal hydrops may occur (Riley & Fernandes, 2023).

Those most at risk for contracting parvovirus B19 infection are people in crowded environments, close household contacts of infected people, and day care workers and teachers (Jordan, 2023). Parvovirus B19 may be transmitted vertically via the placenta. The virus is toxic to fetal RBC precursors, resulting in fetal anemia. Fetal hydrops (abnormal accumulation of fluid in fetal serous cavities and tissues) then develops; this may spontaneously resolve or may quickly lead to fetal death (Riley & Fernandes, 2023). An immunization against parvovirus B19 does not exist. Advise pregnant patients to avoid contact with people known to be infected with the virus.

Group B Streptococcus

GBS is a gram-positive bacterium colonizing in the gastrointestinal and genitourinary tracts. GBS colonization is present in 10% to 30% of pregnant people (Morgan et al., 2023). GBS is transmitted to the newborn via vaginal labor and birth. GBS maternal colonization increases the risk for chorioamnionitis, endometritis, cesarean delivery, and postpartum wound infection. About 50% of colonized pregnant people transmit the infection to their infant, but only 1% to 2% of those infants develop GBS disease (Puopolo & Baker, 2023). GBS is the most common cause of sepsis and meningitis in newborns and is a frequent cause of newborn pneumonia (Morgan et al., 2023). Newborns with early-onset GBS infections usually present within 24 hours of birth (up to 6 days of age),

while those with late-onset infection present between 7 and 89 days of age (Puopolo & Baker, 2023).

All pregnant people should be screened for GBS colonization with a rectovaginal culture at 35 to 37 weeks' gestation. Maternal intrapartum prophylaxis is necessary in GBS-positive people. A loading intravenous dose is followed by intermittent doses every 4 hours throughout labor. Penicillin G and ampicillin are the drugs of choice, with clindamycin being used in people who are allergic to penicillin. If the pregnant person's GBS status is unknown, intravenous antibiotics should be administered during labor for patients who present with preterm labor. Antibiotic prophylaxis should be initiated in patients with preterm labor or rupture of membranes longer than 18 hours, if the laboring person's temperature is greater than 100.4°F (38°C), or if there is history of invasive early-onset GBS infection in a sibling (Morgan et al., 2023).

Toxoplasmosis

Toxoplasmosis is an infection caused by the parasite *Toxoplasma gondii*; it infects more than 225,000 people in the United States annually (Hökelek, 2022). Cats are the definitive hosts of this parasite and shed it in their feces. It is transferred from hand to mouth after touching cat feces while changing the cat litter box or through gardening in contaminated soil. Consuming undercooked infected meat, such as pork, lamb, or venison; drinking contaminated water; and eating unwashed fruits and vegetables can also transmit this organism. Maternal infection is usually without symptoms (Petersen & Mandelbrot, 2024). Transplacental infection occurs in one infant per 10,000 live births each year in the United States (Guerina & Marquez, 2022).

Although 70% to 90% of infected newborns will be without symptoms, clinical manifestations occurring in 50% or more symptomatic cases of congenital toxoplasmosis include chorioretinitis, intracranial calcifications, hydrocephalus, abnormal cerebrospinal fluid, jaundice, thrombocytopenia, and anemia (Guerina & Marquez, 2022). Severity varies with gestational age (Petersen & Mandelbrot, 2024).

Maternal antibiotic administration may decrease the severity of effects on the fetus. It should be initiated at greater than 14 weeks' gestation to minimize teratogenic effects on the fetus. The treatment of choice is spiramycin in the first trimester (<14 weeks), and pyrimethamine–sulfadiazine when therapy is begun after 14 weeks of gestation (Petersen & Mandelbrot, 2024). Preventing infection in pregnant patients is key to avoiding infection in newborns (Teaching Guidelines 20.3).

TEACHING GUIDELINES 20.3 Teaching to Prevent Toxoplasmosis

- Avoid eating raw or undercooked meat, especially lamb or pork. Cook all meat to an internal temperature of 160°F (71°C) throughout.
- Clean cutting boards, work surfaces, and utensils with hot, soapy water after contact with raw meat or unwashed fruits and vegetables.
- Peel or thoroughly wash all raw fruits and vegetables before eating them.
- Wash hands thoroughly with warm water and soap after handling raw meat.
- Avoid feeding the cat raw or undercooked meats.
- Wash hands with soap and water after handling fruits and vegetables.
- Avoid emptying or cleaning the cat's litter box. Have someone else do it daily.
- Keep outdoor sandboxes covered to prevent cat feces contamination.
- Keep the cat indoors to prevent it from hunting and eating birds or rodents.
- Avoid uncooked eggs and unpasteurized milk.
- Avoid drinking unfiltered water in any setting.
- Avoid eating raw shellfish like oysters, clams, or mussels.
- Use a food thermometer to make sure it is cooked to a safe temperature.
- Wear gardening gloves when in contact with outdoor soil (Hökelek, 2022; Petersen & Mandelbrot, 2024).

Tuberculosis

TB is a disease that represents a global health hazard (Hui & Lao, 2022). It is caused by inhalation of *Mycobacterium tuberculosis*. In the United States, 2.5 cases occur per 100,000 people each year (CDC, 2024c). The most common site of infection is the pulmonary system, but extrapulmonary effects may also occur. Risk factors for TB include recent immigration, homelessness, overcrowded living situations, immunocompromised status, and injectable drug use.

When treated adequately, TB in pregnant people has outcomes equivalent to those in nonpregnant people, with neonatal and maternal morbidity also being reduced (Hui & Lao, 2022). Active TB infection increases the maternal risk of miscarriage, stillbirth, placenta previa, preeclampsia, eclampsia, preterm delivery, anemia, sepsis, cesarean delivery, and postpartum hemorrhage. Maternal TB increases the risk of fetal distress, low birth weight, fetal growth restriction, low Apgar scores, birth asphyxia, and congenital anomalies (Hui & Lao, 2022). The newborn is at risk of postnatally acquired TB if the birthing parent still has active TB at the time of birth. Therefore, prenatal diagnosis and effective treatment of the pregnant person are essential.

TB refers to an active TB infection resulting in signs and symptoms of the disease. These include fever,

pleuritic pain, cough, fatigue, and arthralgia (Pozniak, 2024). Pregnant people who are at high risk for TB infection or who are demonstrating symptoms suggestive of TB should have a tuberculin skin test (TST) or interferon-γ release assay (IGRA). Both the TST and IGRA are positive in those with active TB but are not diagnostic of TB in the absence of a positive chest x-ray finding and sputum acid-fast bacilli culture (Friedman & Tanoue, 2024). The TST and IGRA are also positive in people with latent TB infection, but the person is without symptoms and is noninfectious (Pozniak, 2024).

Pregnant people should start treatment as soon as TB is identified. The multidrug treatment regimen lasts for 9 months. In the first 2 months, isoniazid (INH), rifampin, and ethambutol are given. The remaining 7 months of therapy include INH and rifampin. In addition, pyridoxine (vitamin B6) should be given to prevent peripheral neuropathy associated with INH treatment. Latent TB infection (without signs of disease) does not require treatment.

Adherence to multidrug therapy is critical to protect the patient and the fetus from the progression of TB. Provide education about the disease process, the mode of transmission, prevention, potential complications, and the importance of adhering to the treatment regimen.

Breastfeeding is not contraindicated during the time the birthing parent is on the medication regimen and should in fact be encouraged. If the birthing parent is untreated for TB at the time of childbirth, they should not breastfeed or be in direct contact with the newborn until at least 2 weeks after starting antitubercular medications (Friedman & Tanoue, 2024). Untreated lactating parents can be encouraged to pump their milk to feed their newborns until they can breastfeed directly (CDC, 2024a). Nurses should consult their hospital policies regarding parents with TB for additional guidance.

HIV Infection

The **human immunodeficiency virus (HIV)** infection is a chronic infection caused by the retrovirus HIV and is transmitted via blood and body fluids. The virus affects the T cells that express CD4 receptors causing immunodeficiency. Once infected, the person may remain without symptoms or develop an acute response, usually within 2 to 4 weeks but as long as 10 months (Sax, 2024). When symptomatic, acute HIV infection results in fever, diarrhea, headache, lymphadenopathy, myalgia/arthralgia, rash, sore throat, and weight loss (Sax, 2024). Without treatment, acute HIV infection progresses to chronic HIV infection. When the CD4-positive cell count falls below 200 cells/mm^3, **acquired immunodeficiency syndrome (AIDS)** occurs (HIVinfo.NIH.gov, 2023). With AIDS, certain opportunistic infections, particular cancers, neurocognitive decline, and eventual death occur. Though the incidence has been decreasing, each year nearly 7,000 females become infected with HIV (CDC, 2023). The majority become infected via heterosexual contact (Peterson & Kleeman, 2022). HIV during pregnancy places the fetus and newborn at risk for prematurity, fetal growth restriction, low birth weight, and infection.

Pathophysiology

HIV is an RNA retrovirus that is transmitted through infected blood and bodily secretions. The three recognized modes of HIV transmission are unprotected sexual intercourse with an infected partner, contact with infected blood or blood products, and perinatal (vertical) transmission. Once infected with HIV, the person develops antibodies that can be detected with an enzyme-linked immunosorbent assay (ELISA) and confirmed with the Western blot test about 3 weeks after infection. All pregnant people should be screened for HIV at the initial prenatal visit.

> **TAKE NOTE!**
>
> HIV is not transmitted by doorknobs, faucets, toilets, dirty dishes, mosquitoes, wet towels, coughing or sneezing, shaking hands, being hugged, or by any other indirect method.

Therapeutic Management

Pregnant people with HIV infection require antiretroviral therapy (ART). Combination ART has been shown to suppress the viral load, significantly decreasing the risk for perinatal transmission (Choudhary, 2022). The medications used to treat nonpregnant adults are also used in pregnant people with HIV infection: nucleoside reverse transcriptase inhibitors (NRTIs), protease inhibitors, integrase inhibitors, and non-NRTIs. A two- or three-drug regimen is used.

It is recommended that having a cesarean birth will reduce the risk of HIV infection (Hughes & Cu-Uvin, 2023). Efforts to reduce instrumentation, such as avoiding the use of an episiotomy, fetal scalp electrodes, and fetal scalp sampling, will also reduce the newborn's exposure to body fluids.

Nursing Assessment

Review the patient's history for risk factors such as higher risk sex practices, multiple sex partners, and injectable drug use. Ask about the presence of symptoms such as fever, diarrhea, headache, muscle or joint pain, rash, and sore throat. Perform a complete physical examination. Note lymphadenopathy if present. Obtain the patient's weight and determine if they have lost weight recently.

LABORATORY AND DIAGNOSTIC TESTING

Early screening allows for prompt confirmation of the HIV diagnosis and initiation of therapies to safeguard the patient's health. The American College of Obstetricians and Gynecologists (ACOG) (2024) recommends offering

HIV testing to pregnant patients at the initial visit. The recommended screening test is a combined antigen/antibody test. Subsequently, a nucleic acid test will determine the viral load. Those with HIV infection are often coinfected with HBV or HCV and should therefore be tested for those as well (Peterson & Kleeman, 2022).

TAKE NOTE!

Screening only people who are identified as high risk based on their histories is inadequate due to the prolonged latency period that can exist after exposure. Additionally, research indicating that treatment with antiretroviral agents could reduce vertical transmission from the infected person to the newborn has dramatically increased the importance of HIV infection screening in pregnancy.

Nursing Management

Pregnant patients are dealing with many issues at their first prenatal visit. The confirmation of pregnancy may be accompanied by feelings of joy, anxiety, depression, or other emotions. Understanding health education may be difficult in these circumstances. To expect patients to understand detailed explanations of HIV infection may be unrealistic. Determine the patient's readiness for this discussion. Identify the patient's individual needs for teaching, emotional support, and physical care, and approach education and counseling in a caring, sensitive manner. In addition to the importance of ongoing prenatal care, a well-balanced diet should be followed. Also address the following information:

- Infection control issues at home
- Safer sex precautions
- Stages of the HIV infectious process
- Symptoms of opportunistic infections
- Referrals to community support, counseling, and financial aid
- Patient's support system and potential caregiver
- Measures to reduce exposure to infections

Educate the patient about the importance of maintaining ART, and provide them with suggestions for dealing with medication side effects. ACOG (2022b) also recommends the discussion of preexposure prophylaxis (PrEP) medication with all sexually active patients, rather than providing this information to only those at high risk of acquiring HIV. Patients must be informed about PrEP to prevent HIV acquisition.

Be aware of the psychosocial sequelae of HIV/AIDS. The person with HIV infection may experience grief, fear, or anxiety about the future of themselves and their child. Along with the medications that are so important to health maintenance, address the patient's mental health needs, family dynamics, capacity to work, and social concerns, and provide appropriate support and guidance. Be aware of your personal beliefs and attitudes toward people with HIV infection. Incorporate this awareness in your actions as you help the patient face the reality of the diagnosis and treatment options. Empathy, understanding, caring, and assistance are key to helping the patient and their family.

PREPARING FOR LABOR, BIRTH, AND POSTPARTUM

Current evidence suggests that cesarean birth performed before the onset of labor and before the rupture of membranes in patients with a viral load greater than 1,000 copies/mL significantly reduces the rate of perinatal transmission. Cesarean section should be performed at 38 weeks' gestation and prior to rupture of membranes (Hughes & Cu-Uvin, 2023). For those with viral loads lower than 100 copies/mL, the method of delivery should be based on viral load, the duration of ruptured membranes, the progress of labor, and other pertinent clinical factors (Hughes & Cu-Uvin, 2023).

Prepare the patient physically and emotionally for the possibility of cesarean birth, and assist as necessary. Ensure that they understand the rationale for the surgical birth. For the patient without viral suppression and who did not take ART in the third trimester, breastfeeding is not recommended due to the increased risk of virus transmission to the newborn. Breastfeeding may be discussed with the provider as an option for birthing parents with viral suppression and who were maintained on ART throughout all of the third trimester (Hughes & Cu-Uvin, 2023).

After the birth of the newborn, the motivation for taking antiretroviral medications may be lower, thus affecting adherence to therapy. Encourage the patient to continue therapy for their own sake as well as that of the newborn. Nurses can make a difference in helping patients adhere to their complex drug regimens. Educate the patient with an HIV infection about self-care measures, including the proper method for disposing of perineal pads to reduce the risk of exposing others to infected body fluids. Finally, teach them the signs and symptoms of infection in newborns and infants, encouraging them to report any to the health care provider.

TAKE NOTE!

When providing direct care, *always* follow standard precautions.

VULNERABLE POPULATIONS

Risks for adverse pregnancy outcomes are dramatically increased for certain vulnerable populations: adolescents, people over the age of 35, people with obesity (BMI ≥30), and people who misuse substances. Although

risks cannot be totally eliminated once pregnancy has begun, they can be reduced through appropriate and timely interventions. Every person's experience with pregnancy is unique and personal. Many people in these special population groups go through pregnancy feeling confusion, isolation, and desperately in need of help but not knowing where to go. Skilled nursing interventions are essential in promoting the best outcome for the patient and baby. Timely support and appropriate interventions during the perinatal period can have long-standing implications for the parent and their newborn, ultimately with the goal of stability and integration of the family as a unit.

Pregnant Adolescents

Adolescence lasts from the onset of puberty to the cessation of physical growth, roughly from 10 to 19 years of age. Adolescents are in between being children and being adults. They need to adjust to the physiologic changes their bodies are undergoing and establish a sexual identity during this time. They search for personal identity and desire freedom and independence of thought and action. It is also a time for building meaningful relationships with others (Fig. 20.4).

Adolescents have special needs when working to accomplish their developmental tasks and making a smooth transition to young adulthood. One of the biggest areas of need is sexual health. Sexuality is a natural aspect of being human, and sexual activity is a basic aspect of human development for young people. Adolescents' normal development includes an attitude of invulnerability and lack of planning for the future. In addition, adolescents often participate in sexual activity, sometimes in submission to peer pressure. They commonly lack the information, skills, and services necessary to make informed choices related to their sexual and reproductive health. As a result, unplanned pregnancies occur.

FIGURE 20.4 Adolescents sharing time together.

For the past three decades, pregnancy in adolescence has been decreasing and currently occurs at a rate of 16.7 per 1,000 live births (CDC, 2021). Currently, fewer high school students are having sexual intercourse, and more sexually active students are using some method of contraception (CDC, 2021). Adolescents need support from parents or other trusted adults, as well as access to youth-friendly reproductive health services. Pregnancy options including continuing with the pregnancy, pursuing adoption, or terminating the pregnancy should be discussed and appropriate referrals made (Berlan et al., 2022).

Health and Social Consequences

Adolescent parenthood can present a challenge. Health issues associated with adolescent pregnancy (particularly younger adolescents) include an increased risk for anemia, preeclampsia, instrumental delivery, preterm birth, low birth weight, fetal growth restriction, postpartum depression, and maternal and infant mortality compared with pregnant people aged 20 and older (Berlan et al., 2022; Chacko, 2023; Maheshwari et al., 2022). Improving adherence to prenatal care is critical for decreasing these risks for pregnant adolescents to improve outcomes for parents and infants. Adverse social outcomes include lower socioeconomic status, fewer years of education, and increased risk of intimate partner violence (Berlan et al., 2022). Children of adolescent birthing parents are at increased risk of mood and behavioral disorders, cognitive and learning problems, early sexual activity, and early parenthood (Chacko, 2023). Additionally, adolescent parents report an increased prevalence of alcohol ingestion and cigarette smoking (Prince & Ayers, 2023).

Recall Rose, the pregnant adolescent with asthma. What issues would be important for the nurse to discuss with her related to her pregnancy, her asthma, and her age?

Nursing Assessment

Assessment of the pregnant adolescent is the same as that for any pregnant person. Having an honest regard for adolescent patients requires getting to know them and being able to appreciate the important aspects of their lives. Doing so forms a basis for the nurse's clinical judgment and promotes care that takes into account the concerns and practical circumstances of the adolescent and family. Skillful practice includes knowing how and when to advise an adolescent and when to listen and refrain from giving advice.

Adolescent pregnancy is an area in which a nurse's moral convictions may influence the care that they provide to patients. Nurses need to examine their own beliefs about adolescent sexuality to identify personal assumptions.

Putting aside one's moral convictions may be difficult, but it is necessary when working with pregnant adolescents. Giving advice insensitively and without context can be interpreted as "preaching," and the adolescent may be inclined to ignore the information. The nurse must be perceptive, flexible, and sensitive and must communicate in a manner that adolescents understand. Respecting adolescents as individuals helps to establish a therapeutic relationship (see the Healthy People 2030 box).

HEALTHY PEOPLE 2030

Objective	Nursing Significance
Reduce pregnancies among adolescents. Increase the proportion of adolescent females at risk for unintended pregnancy who use effective birth control.	• Provide education to adolescents about pregnancy prevention and safer sexual practices. • Teach adolescents about the personal and fetal risk of pregnancy during this period. • Provide confidential counseling to maintain the adolescent's privacy and trust.

Healthy People Objectives retrieved from http://www.healthypeople.gov

Nursing Management

For adolescents, as for adults, pregnancy can be a physically, emotionally, and socially stressful time. Nurses must support adolescents during the transition from childhood into adulthood, which is complicated by their emergence into parenthood. When caring for the pregnant adolescent:

- Assist the adolescent in identifying family and friends who want to be involved and provide support throughout the pregnancy.
- Help the adolescent identify the options for this pregnancy, such as abortion, self-parenting of the child, temporary foster care for the baby or themselves, or placement of the child for adoption.
- Explore with the adolescent if the pregnancy was planned or unintended (becoming aware of why they decided to have a child is necessary to help with the development of the adolescent and their ability to parent).
- Identify barriers to seeking prenatal care, such as lack of transportation, too many problems at home, financial concerns, the long wait for an appointment, and lack of sensitivity on the part of the health care system.
- Monitor maternal and fetal well-being throughout pregnancy and labor (Fig. 20.5).
- Stress that the patient's physical well-being is important for both themselves and their developing fetus, which depends on the patient for their own health-related needs.
- Emphasize the importance of attending prenatal education classes.
- Encourage the patient to set goals and work toward them.
- Assist them in returning to school and furthering their education.
- As appropriate, initiate a referral for career or job counseling.
- Assist with arrangements for care, including stress management and self-care.
- Provide appropriate teaching based on the adolescent's developmental level and emphasize the importance of continued prenatal and follow-up care.

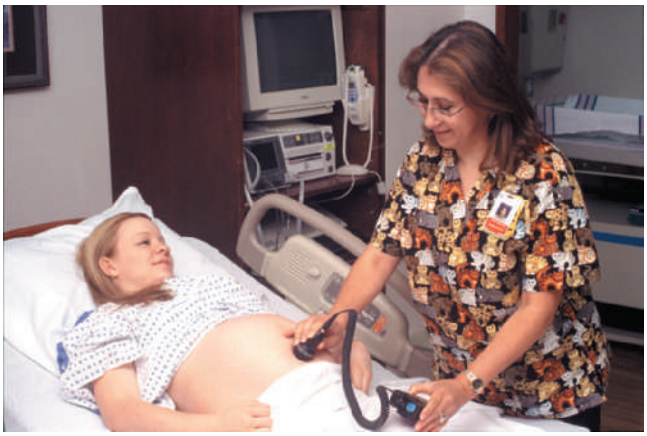

FIGURE 20.5 A pregnant adolescent receiving care during labor.

Nurses can play a major role in preventing adolescent pregnancies, perhaps by volunteering to talk to adolescent groups. Teaching Guidelines 20.4 highlights the key areas for teaching adolescents about pregnancy prevention.

The Pregnant Person of Advanced Maternal Age

Over the last several decades in the United States, there has been a continued trend for people to become pregnant later in life. Since 1990, pregnancy rates for patients under 30 years of age have been decreasing, while pregnancy rates for patients 30 years and older have been increasing (Fretts, 2023). Advanced maternal age is defined as pregnancy in a person 35 years of age or older. U.S. data from 2020 indicate patients of advanced maternal age account for 19% of all pregnancies and 11% of all first-time pregnancies (ACOG, 2022a). Pregnant women of advanced maternal age are at increased risk for gestational diabetes, preeclampsia, labor dystocia, cesarean delivery, preterm delivery, postpartum hemorrhage, neonatal low birth weight, and infant admission to the neonatal intensive care unit. The risks continue to

TEACHING GUIDELINES 20.4 Topics for Teaching Adolescents to Prevent Pregnancy

- High-risk behaviors that lead to pregnancy
- Absolute effectiveness of sexual abstinence
- Involvement in programs such as Teen Pregnancy Prevention (TPP) program, Personal Responsibility Education Program (PREP), or Sexual Risk Avoidance Education Programs
- Planning and goal setting to visualize futures in terms of career, college, travel, and education
- Choice of abstinence even after first becoming sexually active
- Discussions about sexuality with a wise adult, someone they respect who can help put things in perspective
- Protection against STIs and pregnancy if they choose to remain sexually active
- Empowerment to make choices that will shape their lives for years to come, including getting control of their own lives now
- Appropriate use of recreational time, such as sports, drama, volunteer work, music, jobs, religious or spiritual activities, and school clubs

American Academy of Pediatrics. (2023). *Considerations for providing adolescent care*. https://www.aap.org/en/patient-care/adolescent-sexual-health/adolescent-supportive-care/considerations-for-providing-adolescent-care/; and Congressional Research Service. (2022). *Federal teen pregnancy prevention programs*. https://crsreports.congress.gov/product/pdf/IF/IF10877

increase with each 5-year increment of advancing age. Additionally, people 35 years of age and older have a higher prevalence of chronic disorders such as diabetes mellitus, hypertension, and obesity (BMI ≥30), placing them at further risk (ACOG, 2022a).

Impact of Pregnancy on the Person of Advanced Maternal Age

Although maternal complications increase as a person ages, their pregnancy remains a physiologic, not a pathologic, process. In addition to the previously mentioned risks, data have shown that increased maternal age in a first pregnancy demonstrates further risk for premature rupture of membrane, retained placenta/placental fragments, severe perineal tear grade 3/4, placental abruption, chorioamnionitis, puerperal fever, maternal intensive care unit admission, and prolonged hospitalization (greater than 7 days after cesarean or greater than 5 days after vaginal delivery). Risks to the fetus include intrapartum intrauterine fetal death (IUFD), 5-min Apgar score below 7, birth asphyxia, congenital malformations, being LGA, meconium aspiration, jaundice, transient tachypnea of the newborn, brachial plexus injury, mechanical ventilation, seizures, hypoglycemia, sepsis, encephalopathy, and intracranial hemorrhage (Hochler et al., 2023). However, even though increased age implies increased complications, most people today who become pregnant after age 34 have healthy pregnancies and healthy newborns.

Nursing Assessment

Nursing assessment of pregnant people over age 35 is the same as that for any pregnant person. For a person of this age, a preconception visit is important to identify chronic health problems that might affect the pregnancy and also to address lifestyle issues that may take time to modify. Encourage the person of advanced maternal age to plan for the pregnancy by seeing their health care provider before getting pregnant to discuss preexisting medical conditions, medications, and lifestyle choices. Assess for risk factors such as cigarette smoking, poor nutrition, higher or lower body weight, alcohol use, or illicit drug use.

A preconception visit also provides the opportunity to educate the patient about risk factors and provide information on how to modify lifestyle habits to improve the pregnancy outcome. Assist the patient with lifestyle changes so that they can begin pregnancy in an optimal state of health. For example, if the patient is of higher weight, they may wish to discuss weight loss before becoming pregnant. Support them to stop drinking alcohol, start taking folic acid supplements, and stabilize any comorbidities they may have. If the patient smokes, encourage smoking cessation to reduce the effects of nicotine on themselves and the fetus.

Prepare the patient for laboratory and diagnostic testing to establish a baseline for future comparisons. The risk of having a baby with Down syndrome increases with age, especially over age 34. Amniocentesis is routinely offered to all older pregnant people to allow the early detection of numerous chromosomal abnormalities, including Down syndrome. Additionally, a quadruple blood test screen (alpha-fetoprotein [AFP], human chorionic gonadotropin [hCG], unconjugated estriol [UE], and inhibin A [placental hormone]) drawn between 15 and 20 weeks of pregnancy can be helpful in screening for Down syndrome and neural tube defects.

Nursing Management

During routine prenatal visits, the nurse can play a key role in promoting a healthy pregnancy. Consider social, genetic, and environmental factors that are unique to pregnant people of advanced maternal age and prepare to address these factors when providing care.

Assess the patient's knowledge about risk factors and measures to reduce them. Educate them about measures to promote a positive outcome. Encourage them to

get early and regular prenatal care. Advise them to eat a variety of nutritious foods, especially fortified cereals, enriched grain products, and fresh fruits and vegetables; drink at least six to eight glasses of water daily; and take the prescribed vitamin containing 400 mcg of folic acid daily. Also stress the need for the patient to avoid alcohol intake during pregnancy, avoid exposure to second-hand smoke, and take no drugs unless they are prescribed. ACOG recommends the following as well:

- Daily intake of low-dose aspirin (81 mg/day) for the prevention of preeclampsia
- A first-trimester detailed fetal anatomic ultrasound
- An additional ultrasound for growth assessment one time in the third trimester (ACOG, 2022a)

Provide continued maternal and fetal surveillance throughout the pregnancy.

The Pregnant Person With Obesity

In the past two decades, the prevalence of pregnant people with obesity (BMI ≥30) has increased dramatically. Of all females aged 20 to 39 years, obesity demonstrates a near 40% prevalence rate. Data from live births in 2020 show that 26.7% of people were overweight (BMI 25 to 29.9) and 29.5% were obese when they became pregnant (Creanga et al., 2022). Higher body weight during pregnancy places the pregnant person and fetus at increased risk for complications. Maternal complications include miscarriage, gestational diabetes, gestational hypertension, preeclampsia, depression, anxiety, preterm birth, labor and delivery complications, cesarean delivery, venous thromboembolism, and postpartum hemorrhage (Creanga et al., 2022). Fetal complications include intrauterine fetal death, congenital anomalies, macrosomia, and being LGA (Creanga et al., 2022; Ramsey & Schenken, 2024).

Obesity is a medical condition in which adipose tissue as an active endocrine organ has dysregulatory effects on inflammatory, metabolic, and vascular pathways (Ramsey & Schenken, 2024). Preconception assessment and counseling are needed for people with higher weight and should include specific information about maternal and fetal risks of obesity in pregnancy, as well as encouragement to undertake a program that includes diet, exercise, and behavior modification to reduce weight prior to conception.

Pregnant people with obesity require individualized nursing care using a nonjudgmental approach. By lowering their body weight prior to pregnancy, insulin resistance, inflammation, and oxidative stress associated with obesity can be reduced, and adverse effects to the pregnant person or fetus can be minimized (Wei et al., 2022). Extra time may be needed to promote healthful practices, which should include dealing with issues of weight, diet, and exercise. Specialist dietary interventions and evidence-based guidelines for working with childbearing people must be seen as a public health priority by all nurses. This care must be done with honesty and respect for all of the patient's needs. There is an opportunity for health promotion aimed at disseminating information about the risks associated with higher body weight in pregnancy to people of childbearing age who may benefit from such information.

The Pregnant Person and Substance Misuse

Substance misuse in pregnancy is a significant public health problem causing increased morbidity in both the pregnant person and the fetus. The epidemic of substance misuse continues to pose a significant challenge around the globe. Drug misuse affects every social stratum, sex, and race, and pregnant people are no exception. **Perinatal drug misuse** includes the use of alcohol and other drugs by pregnant people. The incidence of substance misuse during pregnancy is highly variable because most pregnant people are reluctant to reveal the extent of their use. Illicit drugs used while pregnant include cannabis, heroin, opioids or psychotherapeutic drugs that were not prescribed by a health care provider, and cocaine.

Cannabis is the most widely used drug during pregnancy in the United States. It remains illegal at the federal level, but many states have legalized it for medicinal or recreational purposes (Substance Abuse and Mental Health Services Administration [SAMHSA], 2022). Between 5% and 15% people reported using cannabis while pregnant (Chang, 2024). In addition, more than 8% reported using alcohol and more than 15% reported smoking cigarettes during their pregnancy (Prince & Ayers, 2023). Cocaine and methamphetamine may also be used by pregnant people. Many pregnant people who use substances during pregnancy are polysubstance users, meaning they use more than one substance (CDC, 2022b).

Research shows that the use of tobacco, alcohol, illicit drugs, or misuse of prescription drugs by pregnant people can have serious health consequences for infants (National Institute on Drug Abuse [NIDA], 2020). Substance use can be viewed along a continuum between social recreational drug use and addiction. Substance misuse is prevalent and continues to remain undetected and underdiagnosed in many pregnant people. Substance misuse rarely starts during pregnancy. More often, people enter pregnancy already dependent on or misusing drugs. Many pregnant people with substance use disorder do not seek prenatal care for fear of legal proceedings or being reported to child protective services (SAMHSA, 2022).

The use of drugs, legal or not, increases the risk of medical complications in the pregnant person and poor birth outcomes in the newborn. The placenta acts as an

active transport mechanism, not as a barrier, and substances pass from a pregnant person to the fetus through the placenta. Thus, along with the pregnant person, the fetus experiences substance use, misuse, and addiction. Additionally, fetal vulnerability to drugs is much greater because the fetus has not developed the enzymatic system needed to metabolize drugs (Prince & Ayers, 2023).

A nonjudgmental atmosphere and unbiased teaching to all pregnant people regardless of their choices or lifestyle is crucial. A caring, concerned manner is critical to helping these people feel safe and respond honestly to assessment questions.

Pregnancy can be a motivator for some who want to try treatment. The goal of therapy is to help the patient deal with pregnancy by developing a trusting relationship. Providing a full spectrum of medical, social, and emotional care is necessary.

Effects of Commonly Misused Substances

Substance misuse during pregnancy, particularly in the first trimester, has a negative effect on the health of the pregnant person and the growth and development of the fetus. The fetus experiences the same systemic effects as the pregnant person, but often more severely. The fetus cannot metabolize drugs as efficiently and will experience the effects long after the drugs have left the pregnant person's system. Substance misuse during pregnancy is associated with preeclampsia, preterm labor and delivery, premature rupture of membranes, spontaneous abortion, placental abruption, depressed Apgar scores, fetal growth restriction, meconium staining at birth, low birth weight, neurobehavioral abnormalities, and long-term childhood developmental consequences (Jansson, 2023). Refer to Table 20.6 for the effects of specific drugs.

TABLE 20.6 • Effects of Select Drugs on Pregnancy

Substance	Effect on Pregnancy
Alcohol	Spontaneous abortion, inadequate weight gain, IUGR, FASD (the leading cause of intellectual disability)
Caffeine	Vasoconstriction and mild diuresis in pregnant person; fetal stimulation, but teratogenic effects not documented via research
Nicotine	Vasoconstriction, reduced uteroplacental blood flow, decreased birth weight, spontaneous abortion, prematurity, placental abruption, fetal demise
Cocaine	Vasoconstriction, gestational hypertension, placental abruption, spontaneous abortion, central nervous system defects, IUGR
Cannabis	Anemia, inadequate weight gain, "amotivational syndrome," hyperactive startle reflex, newborn tremors, prematurity, IUGR
Opiates and narcotics	Maternal and fetal withdrawal, placental abruption, preterm labor, premature rupture of membranes, perinatal asphyxia, newborn sepsis and death, intellectual impairment, malnutrition
Sedatives	Central nervous system depression, newborn withdrawal, maternal seizures in labor, neonatal abstinence syndrome, delayed lung maturity

FASD, fetal alcohol spectrum disorder; IUGR, intrauterine growth restriction.

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CANNABIS

Cannabis is a preparation of the leaves and flowering tops of *Cannabis sativa*, the hemp plant, which contains a number of pharmacologically active agents. Tetrahydrocannabinol (THC) is the most active ingredient of cannabis. It is lipid soluble, so its distribution to the brain and fat occurs easily, and high fetal concentrations can be achieved with heavy exposure (Shukla & Doshi, 2023). Though the federal government continues to consider cannabis a Schedule I substance (having no medicinal uses and at high risk for misuse), several states have legalized it for adult recreational use or medicinal use (pain, nausea and vomiting, HIV/AIDS, cancer). Cannabis use increases the risk of preterm labor and delivery, decreased birth weight, and neonatal intensive care unit admission (Shukla & Doshi, 2023). Other newborn effects of in utero cannabis exposure are not yet known, as evidence thus far has been inconclusive or contradictory. Childhood effects include impulse control, attention, and problem-solving deficits, as well as lower global scholastic achievement (Shukla & Doshi, 2023). ACOG (2021c) advises cessation of cannabis use in pregnancy and lactation, even if it has been prescribed for medicinal purposes.

ALCOHOL

Alcohol misuse is a major public health issue in the United States. Alcohol is a **teratogen**, a substance known to be toxic to human development. The true rate of prenatal alcohol consumption is unknown. It is recognized that fetal alcohol spectrum disorder (FASD) is entirely preventable through alcohol abstinence. Theoretically, no parent would give a glass of wine, beer, or hard liquor to their newborn, but when they drink, the embryo or fetus is exposed to the same blood alcohol concentration as they are. Alcohol is a teratogen with irreversible

central nervous effects on the newborn (Weitzman & Rojmahamongkol, 2022). Refer to Chapter 24 for further information about FASD. The preferred action taken to prevent alcohol consumption during pregnancy is abstinence, as no amount of alcohol consumption is considered safe during pregnancy. Damage to the fetus can occur at any stage of pregnancy, even before a person knows they are pregnant (ACOG, 2021b) (see the Healthy People 2030 box).

HEALTHY PEOPLE 2030

Objective	Nursing Significance
Increase abstinence from alcohol among pregnant people.	• Educate people in the preconception and prenatal periods to abstain from alcohol to avoid fetal effects. • Refer to self-help programs as needed.

Healthy People Objectives retrieved from http://www.healthypeople.gov

NICOTINE

Cigarette smoking during pregnancy is the biggest preventable cause of death and illness in pregnant people and infants and is associated with numerous obstetric, fetal, and developmental complications, as well as an increased risk of adverse health consequences in the adult offspring. Nicotine replacement therapy has been developed as a pharmacotherapy for smoking cessation and is considered to be a safer alternative to smoking during pregnancy. The safety of nicotine replacement therapy (transdermal patches and bupropion) use during pregnancy has been evaluated in a limited number of short-term human trials, but there is currently no information on the long-term effects of developmental nicotine exposure in humans. However, nicotine replacement therapies do help some people who smoke quit, so their use is considered safer than continued smoking (NIDA, 2022).

Nicotine is found in cigarettes and is another substance that is harmful to the pregnant person and their fetus. Nicotine, which causes vasoconstriction, transfers across the placenta and reduces blood flow to the fetus, contributing to fetal hypoxia. When compared with alcohol, cannabis, and other illicit drug use, tobacco use is less likely to decline as the pregnancy progresses (NIDA, 2022). Smoking is associated with adverse pregnancy outcomes. However, these adverse outcomes can be avoided if the person stops smoking before becoming pregnant.

Smoking increases the risk of spontaneous abortion; stillbirth; ectopic pregnancy; placental abruption; preterm labor and birth; preterm premature rupture of membranes; maternal hypertension; low birth weight; and increased signs of excitability, stress, and hypertonicity. Additionally, exposure to cigarette smoke significantly increases the risk of sudden unexplained infant death (SUID) (Rodriguez, 2023) (see the Healthy People 2030 box).

HEALTHY PEOPLE 2030

Objective	Nursing Significance
Increase abstinence from cigarette smoking among pregnant people.	• Educate pregnant people about the fetal effects of cigarette smoking. • Refer to the smoking cessation program. • Support the patient in their effort to quit smoking.

Healthy People Objectives retrieved from http://www.healthypeople.gov

CAFFEINE

Caffeine is a stimulant found in tea, coffee, soft drinks, chocolate, and energy drinks. About 90% of all adults worldwide consume caffeine daily (Bordeaux, 2023). During pregnancy, caffeine clearance from the blood slows down significantly. Evidence indicates maternal caffeine use is associated with growth restriction (low birth weight and shorter stature) (Gleason et al., 2022). Birth defects have not been linked to caffeine consumption, but maternal coffee consumption decreases iron absorption and may increase the risk of anemia during pregnancy.

All energy drinks surpass the FDA official soft drink concentration of caffeine limit, typically two to four times the amount seen in one serving of soda or tea. Adverse effects of energy drinks can even occur in healthy people, and pregnant people are considered an at-risk group, so they should avoid excessive caffeine intake, which has been linked to adverse reproductive outcomes, such as low birth weight. Evidence demonstrates consumption of energy drinks is associated with increased demand of the heart resulting in increased cardiac output, increased systolic and diastolic blood pressure, and QTc prolongation; anecdotal reports include atrial fibrillation, myocardial infarction, and sudden death (Somers & Svatikova, 2020). Health care providers recommend pregnant people exclude carbonated and energy drinks, as they contain large amounts of sugar, caffeine, colorants, and preservatives. Nurses should advise pregnant patients to drink water instead of soda or energy drinks.

COCAINE

Though cannabis, alcohol, and tobacco are used much more often by pregnant people, cocaine and stimulant use is on the rise (Chang & Rosenthal, 2024). Cocaine is sniffed into the mucous membranes of the

nose, smoked, or injected. Because cocaine crosses the placenta as well as the fetal blood–brain barrier, it is thought that its primary mechanism for placental and fetal damage is vasoconstriction. Uteroplacental insufficiency may occur from reduced blood flow; this reduces placental perfusion. Adverse effects are related to dose and stage of pregnancy. In utero cocaine exposure increases the risk of preterm birth, low birth weight, shorter length for gestational age, and being SGA (Chang, 2024).

METHAMPHETAMINE

Methamphetamine is a powerful, highly addictive central nervous stimulant that alters the release and reuptake of neurotransmitters such as dopamine, serotonin, and norepinephrine. Approximately 2 million adults use it annually (Pew Charitable Trusts, 2024). A highly addictive stimulant, methamphetamine is smoked, injected, sniffed via the nasal mucosa, or taken orally. Maternal effects include an intense rush lasting 5 to 30 minutes, insomnia, acute anxiety, agitation, and psychotic or violent behavior (Yasaei & Saadabad, 2023). Signs of use include poor dental hygiene, injection track marks, unhealthy complexion, skin abscesses from skin picking, and pallor. Few studies have conclusively determined the fetal effects of maternal methamphetamine use, but it is known that it increases the risk for low birth weight, the newborn being SGA, and possibly childhood neurodevelopmental anomalies (ACOG, 2021a).

SEDATIVES

Sedatives relax the central nervous system and are used medically for inducing relaxation and sleep, relieving tension, and treating seizures. Sedatives easily cross the placenta and can cause birth defects and behavioral problems. Infants born to people who misuse sedatives during pregnancy may be physically dependent on the drugs themselves and are more prone to respiratory problems, vigorous sucking, vomiting, loose stools, hypertonicity, and poor weight gain (Jansson, 2023).

OPIOIDS AND NARCOTICS

Over the past decade, the United States has experienced an epidemic of prescription opioid misuse. Opioids and narcotics include opium, heroin, morphine, codeine, fentanyl, hydromorphone (Dilaudid), oxycodone (Percodan), meperidine (Demerol), and methadone. Opiates can be inhaled, injected, snorted, ingested, or used subcutaneously. These drugs are central nervous system depressants that soothe and lull. They may be prescribed medically for pain management, but all have a high potential for misuse. Most are capable of causing intense addiction in both the pregnant person and the newborn. Up to 2.7% of pregnancies are complicated by opioid misuse (Chang, 2024). Another concern is that maternal opiate overdose deaths have increased dramatically in recent years (Han et al., 2023).

Narcotic dependence is particularly problematic in pregnant people as the effects on the fetus can be severe (Seligman et al., 2023). Taking opiates or narcotics during pregnancy places the person at increased risk for preterm labor, fetal growth restriction, placental abruption, perinatal mortality, preterm rupture of membranes, and preeclampsia (Chang, 2024). Pain medications are the most commonly misused prescription drugs, while heroin is the most common illicitly used opioid. Heroin, which easily crosses the placenta, is derived from the seeds of the poppy plant and can be sniffed, smoked, or injected. The most common harmful effect of heroin and other opioids on newborns is withdrawal or **neonatal opioid withdrawal syndrome (NOWS)** (see Chapter 24).

Withdrawal from opiates during pregnancy is extremely dangerous for the fetus, so a prescribed oral methadone or buprenorphine maintenance program combined with psychotherapy is recommended for the pregnant person. This closely supervised treatment program reduces drug cravings, blocks the euphoric effects of narcotic drugs in order to reduce illicit drug use, and reduces withdrawal symptoms in the newborn. Useful therapies include self-help, 12-step groups, individual and group substance misuse counseling, and psychotherapy.

See the Healthy People 2030 box.

HEALTHY PEOPLE 2030

Objective	Nursing Significance
Increase abstinence from illicit drugs among pregnant people.	• To avoid adverse fetal effects, educate people in the preconception and prenatal periods to abstain from illicit drugs and to not misuse prescription medications. • Refer the patient with opioid dependence for treatment.

Healthy People Objectives retrieved from http://www.healthypeople.gov

Nursing Assessment

Routine screening and education of people of childbearing age remain the most important ways to reduce addiction in pregnancy. Complete a thorough history and physical examination to evaluate a patient for substance use and misuse. Substance misuse screening in pregnancy is done to detect the use of any substance known or suspected to exert a deleterious effect on the patient or their fetus. Routinely ask all people who can become pregnant about substance misuse, inform them of the risks involved, and advise them against continuing. Screening questionnaires are helpful in identifying potential use, may reduce the stigma of asking patients about substance misuse, and may result in a more accurate and consistent evaluation. The questions in Box 20.1 may be helpful in assessing a patient who is at risk for substance

BOX 20.1 Sample Questions for Assessing Substance Use

- Have you ever used recreational drugs? If so, when and what?
- Have you ever taken a prescription drug other than as intended?
- What are your feelings about drug use during pregnancy?
- How often do you smoke cigarettes? How many per day?
- How often do you drink alcohol?
- Have you ever felt guilty about drinking or drug use?

If the assessment reveals substance use, obtain additional information by using the CRAFFT questionnaire, which is a sensitive screening instrument for identifying substance misuse (CRAFFT):

- *C:* Have you ever ridden in a **c**ar driven by someone (including yourself) who was high or drunk?
- *R:* Do you drink or take drugs to **r**elax, improve your self-image, or fit in?
- *A:* Do you ever drink or take drugs while **a**lone?
- *F:* Do you have any close **f**riends who drink or take drugs?
- *F:* Does a close **f**amily member have a problem with alcohol or drugs?
- *T:* Have you ever gotten in **t**rouble from drinking or taking drugs?

National Institute on Drugs Abuse. (2023). *Screening and assessment tools chart*. https://nida.nih.gov/nidamed-medical-health-professionals/screening-tools-resources/chart-screening-tools; and Saxon, A. J. (2023). Screening for unhealthy use of alcohol and other drugs in primary care. *UpToDate*. Retrieved May 7, 2024, from https://www.uptodate.com/contents/screening-for-unhealthy-use-of-alcohol-and-other-drugs-in-primary-care

misuse during pregnancy. Using accepting terminology may encourage the patient to give honest answers without fear of reproach.

A urine toxicology screen may be helpful in determining drug use, although a urine screen identifies only recent or heavy use of drugs. The length of time a drug is present in urine is as follows:

- Cocaine: with 6 to 12 hours of use, up to 3 days after
- Opioids: 1 to 4 days after use
- Amphetamines: 1 to 3 days after use
- Cannabis: 1 week to 1 month after use but may yield false positives (Mukherji et al., 2023)

Nursing Management

If the patient's drug screen is positive, use this as an opportunity to discuss prenatal exposure to substances that may be harmful. The discussion may lead the nurse to refer the patient for a diagnostic assessment or identify an intervention such as counseling that may be helpful. Being nonjudgmental is a key to success; a patient is more apt to trust and reveal patterns of misuse if the nurse does not judge the patient and their choices.

A positive drug screen in a newborn may warrant an investigation by the state protection agency (according to state laws). If the newborn exhibits clinical manifestations of NOWS, institute measures to reduce stress and stimuli to promote the newborn's comfort (see Chapter 24 for a more in-depth discussion).

Be proactive, supportive, and accepting when caring for the patient. Assure people with substance use disorder that sharing information of a confidential nature with health care providers will not render them liable to criminal prosecution. Provide counseling and education, emphasizing the following:

- Effects of substance exposure on the fetus
- Interventions to improve parent–child attachment and improve parenting
- Psychosocial support if treatment is needed to reduce substance misuse
- Referral to outreach programs to improve access to treatment facilities
- Hazardous legal substances to avoid during pregnancy
- Follow-up of children born to parents with substance use disorder
- Dietary counseling to improve the pregnancy outcome for both parent and child
- Drug screening to identify all drugs a patient is using
- More frequent prenatal visits to monitor fetal well-being
- Maternal and fetal benefits of remaining drug free
- Cultural sensitivity
- Promotion of family involvement in a rehabilitation program
- Strengthening of individual and family coping skills
- Coping skills, support systems, and vocational assistance

There is nothing categorically different about addiction during pregnancy compared to addiction in general. Pregnant people with substance dependence issues are people who use drugs, get pregnant, and cannot stop using drugs. Substance misuse is a complex problem that requires sensitivity to each person's unique situation and contributing factors. Be sure to address individual psychological and sociocultural factors to help the patient regain control. Nurses must be aware of these people's unique needs and the related legal and ethical ramifications surrounding pregnancy. Treatment must combine different approaches and provide ongoing support for people learning to live drug free. Developing personal strengths, such as communication skills, assertiveness, and self-confidence, will help the patient to resist drug use. Encourage the use of appropriate coping skills. Enhancing self-esteem also helps provide a foundation to avoid drugs. Through therapeutic communication, nursing interventions, clinical assessment, and building trusting relationships, nurses can have a significant impact in managing patients with substance misuse.

KEY CONCEPTS

- Preconception counseling for the person with diabetes is helpful in promoting blood glucose control to prevent congenital anomalies.
- The classification system for diabetes is based on disease etiology and not pharmacology management;

the classification includes type 1 diabetes, type 2 diabetes, and gestational diabetes.
- The risk classification for heart disease during pregnancy helps determine how much risk the person has for morbidity and mortality.
- Chronic hypertension exists when the person has a blood pressure of 140/90 mm Hg or higher before pregnancy or before the 20th week of gestation or when hypertension persists for more than 12 weeks postpartum.
- Successful management of asthma in pregnancy involves the elimination of environmental triggers, drug therapy, and patient education.
- Ideally, people with hematologic conditions are screened before conception and are made aware of the risks to themselves and to a pregnancy.
- A wide variety of infections, such as CMV, rubella, herpes simplex, hepatitis B, varicella, parvovirus B19, and many STIs can affect a pregnancy, having negative impacts on its outcome.
- Cases of perinatal HIV transmission have decreased in the past several years in the United States, primarily because of the use of ART in pregnant people with HIV.
- ACOG recommends all pregnant people should be offered HIV antibody testing regardless of their risk of infection and that testing should be done during the initial prenatal evaluation.
- The nurse's role in caring for the pregnant adolescent is to assist in identifying the options for this pregnancy, including abortion, self-parenting of the child, temporary foster care for the baby or themselves, or placement for adoption.
- Pregnant people with substance use disorder commonly misuse several substances, making it difficult to ascribe a specific perinatal effect to any one substance. Societal attitudes regarding pregnant people and substance misuse may prohibit them from admitting the problem and seeking treatment.
- Substance misuse during pregnancy is associated with preterm labor, spontaneous abortion, low birth weight, central nervous system and fetal anomalies, and long-term childhood developmental consequences.

Unfolding Patient Stories: Amelia Sung • Part 2

Think back to Amelia Sung, who, as you learned in Chapter 12, is 36 years old and gravida 2 para 1. She is diagnosed with gestational diabetes mellitus at 26 weeks. Explain the areas of education the nurse should provide regarding diabetes management.

How does the nurse evaluate Amelia's understanding of the information provided and her ability to manage diabetes and maintain normal glucose levels?

Care for Amelia and other patients in a realistic virtual environment: ***vSim*** *for Nursing* (thepoint.lww.com/vSim-Maternity). Practice documenting these patients' care in DocuCare (thepoint.lww.com/DocuCareEHR).

- Nursing care for the person with substance misuse focuses on screening and preventing substance misuse to reduce the high incidence of obstetric and medical complications as well as the morbidity and mortality among passively addicted newborns.

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DEVELOPING CLINICAL JUDGMENT

PRACTICING FOR NCLEX

1. The nurse is teaching a pregnant person about the pathophysiologic mechanisms associated with gestational diabetes. What should the nurse include in the teaching?
   a. Pregnancy fosters the development of carbohydrate cravings.
   b. There is progressive resistance to the effects of insulin.
   c. Hypoinsulinemia develops early in the first trimester.
   d. Glucose levels decrease to accommodate fetal growth.

2. The nurse is providing prenatal education to a pregnant person with asthma. Which action would be important for the nurse to take?
   a. Explain that the patient should avoid steroids during pregnancy.
   b. Demonstrate how the patient can assess their blood glucose levels.
   c. Teach correct administration of subcutaneous bronchodilators.
   d. Ensure the patient seeks treatment for any acute exacerbation.

3. Which condition would most likely cause a pregnant person with type 1 diabetes the greatest difficulty during pregnancy?
   a. Placenta previa
   b. Hyperemesis gravidarum
   c. Placental abruption
   d. Rh incompatibility

4. The nurse has provided preconceptual counseling about abstaining from alcohol ingestion when pregnant. What is the reason for this?
   a. Pregnant people often produce more alcohol dehydrogenase when drinking.
   b. Pregnant people typically become intoxicated more quickly than before pregnancy.
   c. Alcohol ingestion places the infant at risk for FASD.
   d. Weight gain throughout gestation will be a few pounds lower without alcohol.

5. The nurse is explaining HIV infection and transmission to a pregnant person. Which information would the nurse include?
   a. It primarily occurs when there is a large viral load in the blood.
   b. HIV is most commonly transmitted via sexual contact.
   c. It affects the majority of infants of birthing parents with HIV infection.
   d. Nurses are most frequently affected by needlesticks.

6. People with obesity have a greater risk of developing which condition during pregnancy?
   a. Type 1 diabetes
   b. Hypotension
   c. Low-birth-weight infant
   d. Gestational hypertension

7. The clinic nurse is following two pregnant patients. One is prescribed maintenance methadone, while the other is prescribed buprenorphine maintenance. These medications indicate that both patients have been using which drug?
   a. Alcohol
   b. Nicotine
   c. Opiates
   d. Cannabis

CRITICAL THINKING EXERCISES

1. A patient at 26 weeks' gestation came to the clinic to follow up on their previous 1-hour glucose screening. Their results had come back outside the accepted screening range, and a 3-hour glucose tolerance test (GTT) had been ordered. It resulted in three abnormal values, confirming a diagnosis of gestational diabetes. As the nurse in the prenatal clinic, you are seeing them for the first time.
   a. What additional information will you need to provide care for this patient?
   b. What education will they need to address this new diagnosis?
   c. How will you evaluate the effectiveness of your interventions?

2. A 14-year-old comes to the public health clinic with her parent. The parent tells you that the patient has been "out messing around and has gotten herself pregnant." The patient is crying quietly in the corner and avoids eye contact with you. The parent says their child "must be following in my footsteps" because she became pregnant when she was 15 years old. The patient's parent goes back out into the waiting room and leaves the patient with you.
   a. What is your first approach with the patient to gain her trust?
   b. List the patient's educational needs during this pregnancy.
   c. What prevention strategies are needed to prevent a second pregnancy?

3. A 27-year-old G3P2 is admitted to the labor and birth suite because of preterm rupture of membranes at an estimated 35 weeks' gestation. They have received no prenatal care and report this was an unplanned pregnancy. The patient appears distracted and very thin. They report that their two previous children have been in foster care since

birth because the child welfare authorities "didn't think I was an adequate parent." They deny any recent use of alcohol or drugs, but you smell alcohol on their breath. They had a spontaneous vaginal birth a few hours later, producing a 4-lb baby with Apgar scores of 8 at 1 minute and 9 at 5 minutes.

a. What aspects of this patient's history may lead the nurse to suspect that this infant may be at risk for FASD?
b. What additional screening or laboratory tests might validate your suspicion?
c. What physical and neurodevelopmental deficits might present later in life if the infant has FASD?

STUDY ACTIVITIES

1. In the maternity clinic or hospital setting, interview a pregnant person with a preexisting medical condition (e.g., diabetes, asthma, sickle cell anemia) and find out how this condition affects their life and this pregnancy, especially their lifestyle choices.

2. You have a close friend who you believe is misusing alcohol but denies it. The friend now admits to you that they think they are pregnant because they missed their period. What specific information and advice should you give your friend concerning alcohol use during pregnancy?

3. Should cannabis be legalized nationally in the United States? What impact might your view have on pregnant people and their offspring?

4. Outline a discussion you might have with a pregnant patient who is HIV-positive and doesn't see the need to take antiretroviral agents to prevent perinatal transmission.

5. The nurse is preparing a teaching session about breastfeeding for a group of pregnant people who have various infections listed below. The nurse would include people with which conditions? Select all that apply.

a. Hepatitis B
b. Parvovirus B19
c. Herpesvirus type 2
d. HIV-positive status
e. Cytomegalovirus
f. VZV