Summary  The benefits of exercise in the general population have been well-recognized. There is ample evidence to demonstrate that moderate exercise in a healthy pregnancy results in no adverse effects and provides consequential benefits.

Despite anatomical and physiological changes in pregnancy, women with healthy pregnancies and without contraindications can combine aerobic and resistance elements in their workouts. Clinical evaluation by an obstetrician is recommended before beginning an exercise program. Consideration must be given to the type, intensity, duration, and frequency of exercise when providing the patient with an exercise prescription. Scuba diving and contact sports or exercises with a high risk of falling or abdominal trauma should be avoided. Women who are beginning an exercise program during pregnancy should start slowly and gradually increase to moderate intensity. Women engaging in strenuous physical activities require additional medical supervision.

The nutritional needs of active pregnant women are not clearly defined; however, it should be recognized that there is an additional caloric allowance for increased metabolism and greater energy expenditure both during and after activity. Pregnant women use carbohydrates at a higher rate than do nonpregnant women; this is further increased during exercise, thus adequate carbohydrate intake is essential. Adequate fluid intake helps control the core body temperature and is essential to replace fluid loss during exercise.

Because habits adopted during pregnancy can result in persistent lifestyle improvements, exercise during pregnancy could significantly reduce the lifetime risks of obesity, chronic hypertension and diabetes—not only for pregnant women, but also for their families as well. Overall, a woman whose exercise habits have become firmly entrenched during pregnancy stands a much better chance of maintaining them after her child is born.

Keywords: Physical activity, exercise, nutrition, pregnancy

3.1 INTRODUCTION

Pregnancy is a unique time in a woman’s life in which health awareness increases, and she may be more inclined to accept medical advice to either adopt or continue an active lifestyle. Exercise is considered safe for most women during pregnancy as long as
there are no medical or obstetrical complications [1]. Although physical activity is often considered part of a healthy lifestyle and leisure time activity, some pregnant women may choose to participate in highly competitive sports.

While the health benefits of physical activity are well recognized in the general population [2–6], exercise is still not adequately accepted as a benefit for pregnant women. Healthcare providers remain cautious and often reluctant to encourage exercise during pregnancy, despite the well-recognized benefits. The hesitation is set in conservative ideas that pregnancy is a time of confinement. With abundant evidence to show that moderate exercise in healthy pregnancies results in benefits and without adverse maternal or fetal outcomes, exercise recommendations made by healthcare providers should be a top priority. It is well recognized that healthy lifestyle behaviors adopted in pregnancy can result in persistent lifestyle modifications that could significantly reduce risk factors associated with obesity, chronic hypertension, and diabetes—not only for the pregnant mother, but also for all members of her family.

In this chapter, we review physiological changes that provide the basis for exercise guidelines and nutritional recommendations in pregnancy, as well as maternal and fetal responses to the potential risks and benefits associated with exercise in pregnancy.

3.2 PHYSIOLOGICAL CHANGES IN PREGNANCY

Under the influence of estrogen, progesterone, and elastin, pregnancy is associated with generalized connective tissue laxity, potentially leading to ligament and joint instability [1]. Additional strain on the musculoskeletal system comes from the change in the body’s center of gravity, resulting in progressive lordosis (accentuation of the lumbar curvature of the spine) and kyphosis (curvature of the upper spine) [7]. The change in center of gravity requires greater muscular effort with certain movements, such as rising from a squatting or sitting position or changing directions quickly. The progressive lordosis in pregnancy frequently results in lower back pain, which could be prevented by improving posture and muscular strength preferably prior to pregnancy [8]; such preventative measures are also effective during pregnancy [9]. Providing exercise guidelines to increase core strength prior to pregnancy minimizes these injuries.

Special consideration must be given to changes that occur during each trimester of pregnancy that could result in injury from physical activity in pregnancy. Physical activity in pregnancy can be affected by the following progressive anatomical and physiological changes: change in center of gravity, increased connective tissue laxity resulting in joint instability, lordosis and kyphosis, generalized edema possibly resulting in nerve compression syndrome, increase in blood volume, tachycardia, hyperventilation, and reductions in cardiac reserve and residual lung capacity [10]. Figure 3.1 lists the etiology for potential injury that can occur during exercise in pregnancy and the gestational age during which the injury is most likely to occur. The goal of exercise is to maintain physical fitness within the physiological limitations of pregnancy. Exercise prescriptions should be geared towards muscle strengthening to minimize risk of joint injury and towards correcting postural changes thus diminishing lower back pain.

Physical activity may increase uterine activity (contractions). The effect of exercise on uterine activity has little or no change during the last 8 weeks of pregnancy [11]. While there are no studies reporting that strenuous activity results in preterm labor, until the impact is fully studied, women at risk of preterm labor should be advised to reduce