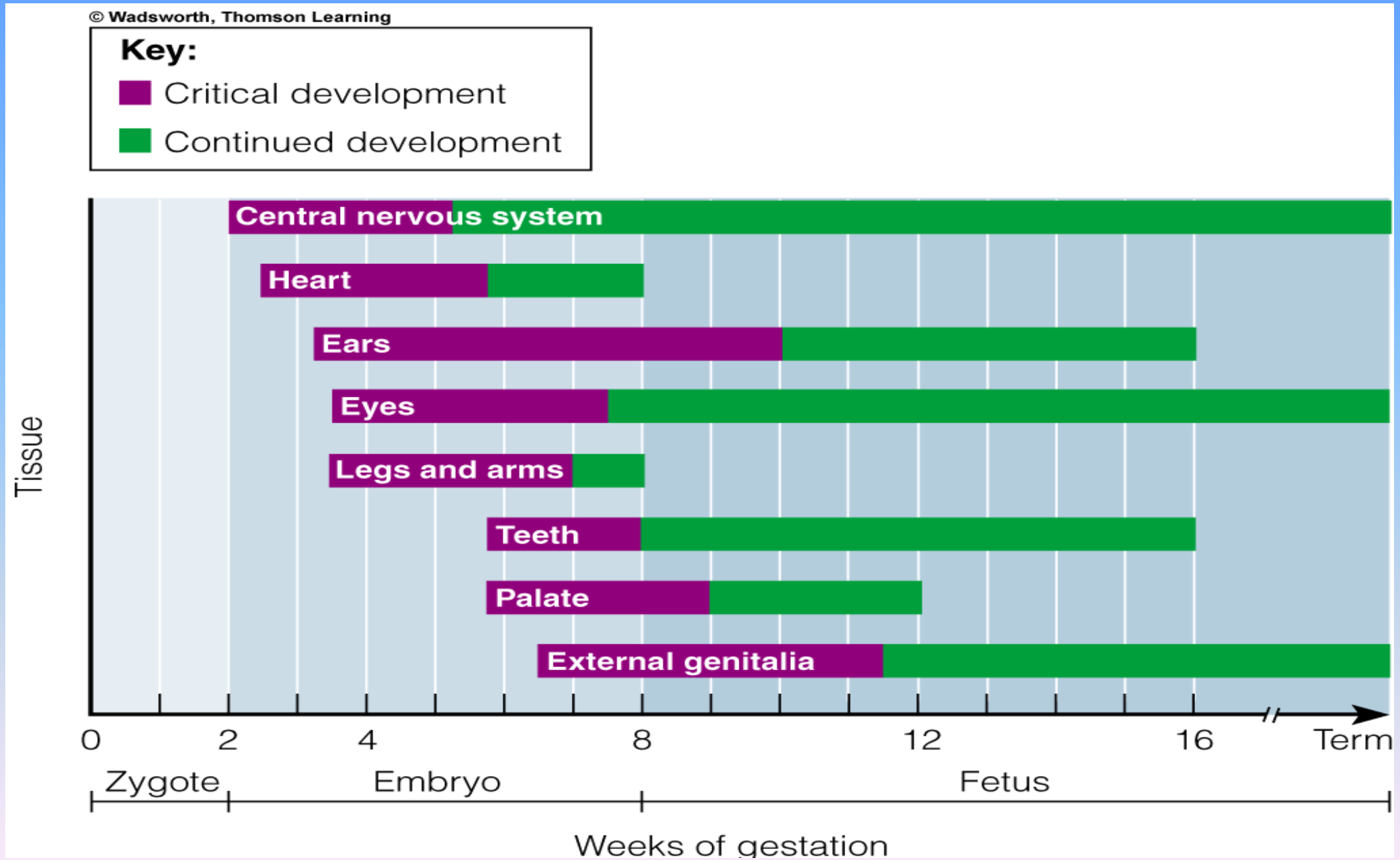
Nutrition During Pregnancy and Lactation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Key:
Critical development
Continued development
Central nervous system
Heart
Ears
Eyes
Legs and arms
Teeth
Palate
External genitalia
Tissue
0
2
4
8
12
16
Term
Zygote
Embryo
Fetus
Weeks of gestation

Weight Gain

TABLE 15-1 Recommended Weight Gains Based on Prepregnancy Weight

Prepregnancy Weight	Recommended Weight Gain
Underweight (BMI <18.5)	28 to 40 lb (12.5 to 18.0 kg)
Healthy weight (BMI 18.5 to 24.9)	25 to 35 lb (11.5 to 16.0 kg)
Overweight (BMI 25.0 to 29.9)	15 to 25 lb (7.0 to 11.5 kg)
Obese (BMI ≥30)	15 lb minimum (6.8 kg minimum)

NOTE: These classifications for BMI are slightly different from those developed in 1990 by the Committee on Nutritional Status during Pregnancy and Lactation for the publication *Nutrition during Pregnancy* (Washington, D.C.: National Academy Press). That committee acknowledged that because such classifications had not been validated by research on pregnancy outcome, "any cut off points will be arbitrary for women of reproductive age." For these reasons, it seems appropriate to use the values developed for adults in 1998 by the National Institutes of Health (see Chapter 8).

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Nutritional Needs During Pregnancy

- Energy:
  - First Trimester - no change
  - Second Trimester - increases 340 kcal/day
  - Third Trimester - increases 452 kcal/day

- Protein:
  - Increases from 46 g/day to 71 g/day

Vitamin and Mineral Requirements in Pregnancy

- Pregnant women are at increased risk for folic acid, iron, and calcium deficiencies.

- Recommendations are:
  - Iron – increases to 27 mg/day
  - Folate – increases to 0.6 mg/day
  - Calcium - 1000 mg/day
  - Magnesium - increases to 360 mg/day
  - Vitamin C - increases to 85 mg/day

Neural Tube Defects (NTD) Prevention: Role of Folate

- Folate deficiency is the most common deficiency during pregnancy

- Functions:
  - Serves as a co-factor in one-carbon transfers, (nucleic acids and amino acids) and therefore required during periods of rapid growth.
  - Increased maternal erythropoesis causes increased folate needs during second and third trimesters.

- Role in Prevention:
  - NTD are thought to result from a dietary deficiency of folate and/or a genetic defect affecting folate metabolism.
  - During pregnancy, the neural tube is formed from the 18th to the 26th **DAY** of gestation.

Folate Requirements in Pregnancy

- Adequate folate is critical before and during the first 4 weeks of pregnancy.

- Since 50% of pregnancies are unplanned and most women do not seek prenatal care until 8 weeks gestation, folate supplements prior to conception are critical to prevent NTD.

Folate Requirements in Pregnancy

- **DRI=600 μg pregnancy or 500 μg lactating female, 400 μg for non-pregnant woman.**
- **<u>Beans, peas, orange juice, green leafy vegetables, fortified cereals are good sources.</u>**
- **Prenatal vitamins contain 1000 μg folate.**

Iron in Pregnancy

- Iron is an essential element in all cells of the body.
- During pregnancy, maternal blood volume increases 20-30%.
- Iron needs increase from 18 to 27 mg/day during pregnancy.
- Deficiency increases risk of maternal and infant death, preterm delivery, and low birth weight babies.

Food Borne Illness

- Raw and highly carnivorous fish should be avoided.
  - Including: fresh tuna, shark, tilefish, swordfish, king mackerel
- All dairy foods and juices should be pasteurized.
- Food contaminated with heavy metals can have neurotoxic effects for the fetus. (Mercury)
- *Listeria monocytogenes* contamination in pregnancy develop into a serious blood borne, transplacental infection.
  - Wash vegetables and fruits
  - Cook meats
  - Avoid processed, precooked meats (cold cuts)
  - Avoid soft cheeses (brie, blue cheese, etc.)

Food cravings and aversions:

Food cravings: a deep longing for a particular food.

Food aversions: a strong desire to avoid a particular food.

Food cravings and aversions that arise during pregnancy are probably due to hormone-induce changes in test and sensitivities to smells.

Nutrition-Related Concerns

TABLE 15-2 Strategies to Alleviate Maternal Discomforts

To Alleviate the Nausea of Pregnancy

- On waking, arise slowly.
- Eat dry toast or crackers.
- Eat small, frequent meals.
- Avoid foods with offensive odors.

To Prevent or Alleviate Constipation

- Eat foods high in fiber (fruits, vegetables, and whole-grain cereals).
- Exercise regularly.
- Drink at least eight glasses of liquids a day.
- Respond promptly to the urge to defecate.
- Use laxatives only as prescribed by a physician; do not use mineral oil, because it interferes with absorption of fat-soluble vitamins.

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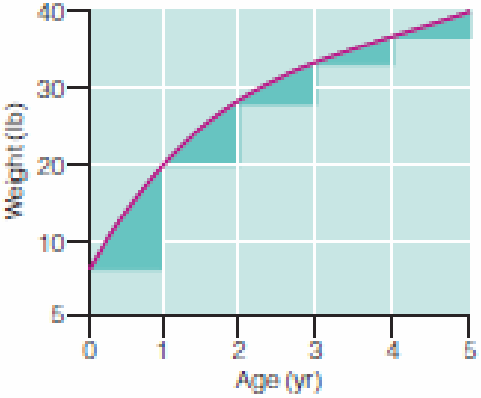
Growth in Infants

- Rapid body growth and brain development during the first year:
  - Weight increases 200%
  - Body length increases 55%
  - Head circumference increases 40%
  - Brain weight doubles

FIGURE 10-9 | Weight Gain of Human Infants in Their First Five Years of Life



In the first year, an infant's birthweight may triple, but over the following several years, the rate of weight gain gradually diminishes.

Feeding the Newborn

- What are the options?
  - Breast feeding
    - The American Academy of Pediatrics recommends exclusive breast feeding for 6 months.
  - Formula feeding

Breastfeeding

TABLE 15-4 Benefits of Breastfeeding

For Infants:

- Provides the appropriate composition and balance of nutrients with high bioavailability.
- Provides hormones that promote physiological development.
- Improves cognitive development.
- Protects against a variety of infections.
- May protect against some chronic diseases, such as diabetes (type 1) and hypertension, later in life.
- Protects against food allergies.

For Mothers:

- Contracts the uterus.
- Delays the return of regular ovulation, thus lengthening birth intervals. (It is not, however, a dependable method of contraception.)
- Conserves iron stores (by prolonging amenorrhea).
- May protect against breast and ovarian cancer.