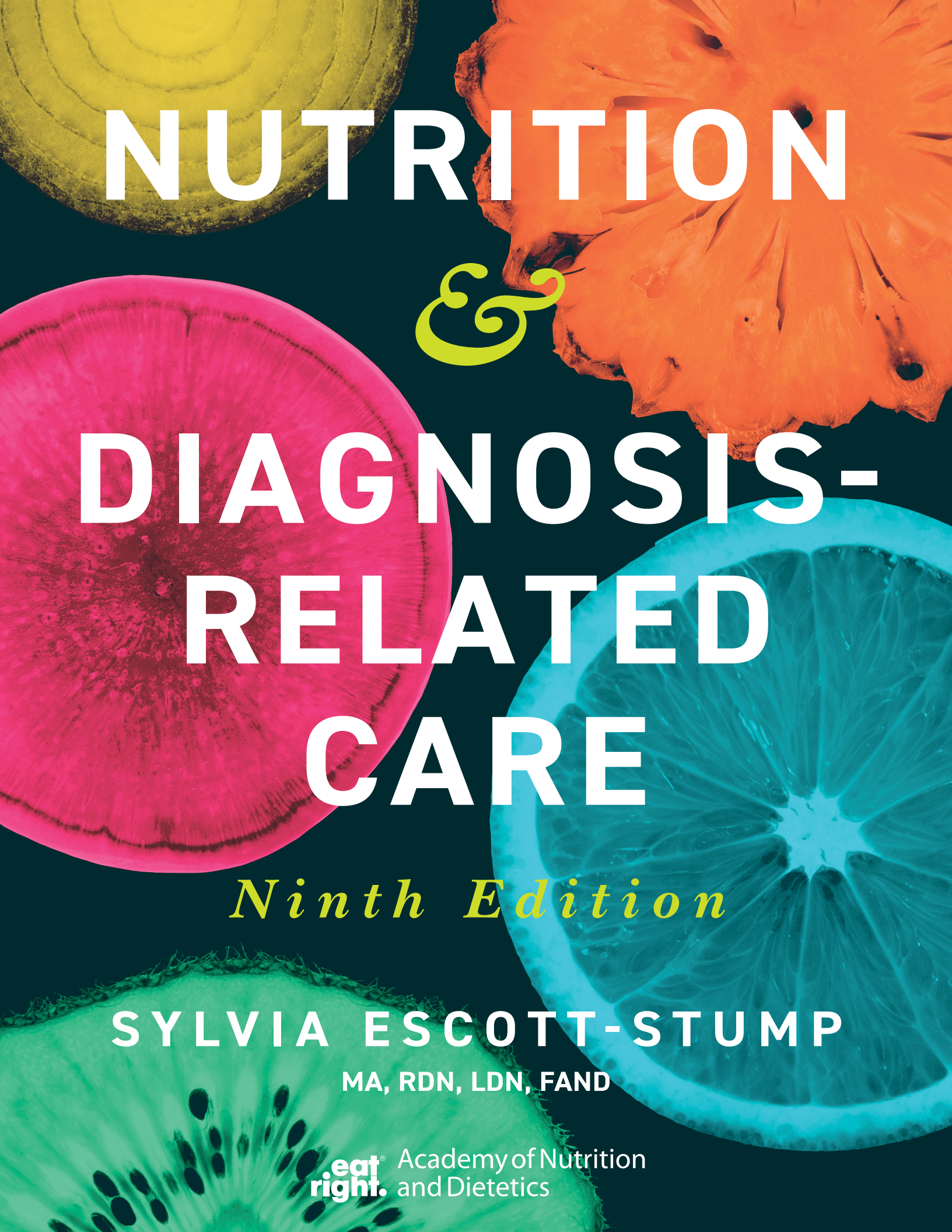

NUTRITION & DIAGNOSIS-RELATED CARE

Ninth Edition

SYLVIA ESCOTT-STUMP
MA, RDN, LDN, FAND

eat right. Academy of Nutrition and Dietetics

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Nutrition and Diagnosis-Related Care, 9th Edition

ISBN 978-0-88091-057-6 (print)
ISBN 978-0-88091-143-6 (eBook)
Catalog Number 057622 (print)
Catalog Number 057622e (eBook)

10 9 8 7 6 5 4 3 2 1

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Library of Congress Cataloging-in-Publication Data
Names: Escott-Stump, Sylvia, author.
Title: Nutrition & diagnosis related care / Sylvia Escott-Stump, MA, RDN, LDN, FAND.
Other titles: Nutrition and diagnosis related care
Description: Ninth edition. | Chicago, IL : Academy of Nutrition and Dietetics, [2022] | Includes bibliographical references and index.
Identifiers: LCCN 2021037212 (print) | LCCN 2021037213 (ebook) | ISBN 9780880910576 (hardcover) | ISBN 9780880911436 (ebook)
Subjects: LCSH: Diet therapy--Handbooks, manuals, etc. | Nutrition--Handbooks, manuals, etc.
Classification: LCC RM217.2 .E83 2021 (print) | LCC RM217.2 (ebook) | DDC 615.8/54--dc23
LC record available at https://lccn.loc.gov/2021037212
LC ebook record available at https://lccn.loc.gov/2021037213

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APPENDIX A Basic Nutrition Principles, Nutrients, and Dietary Supplements

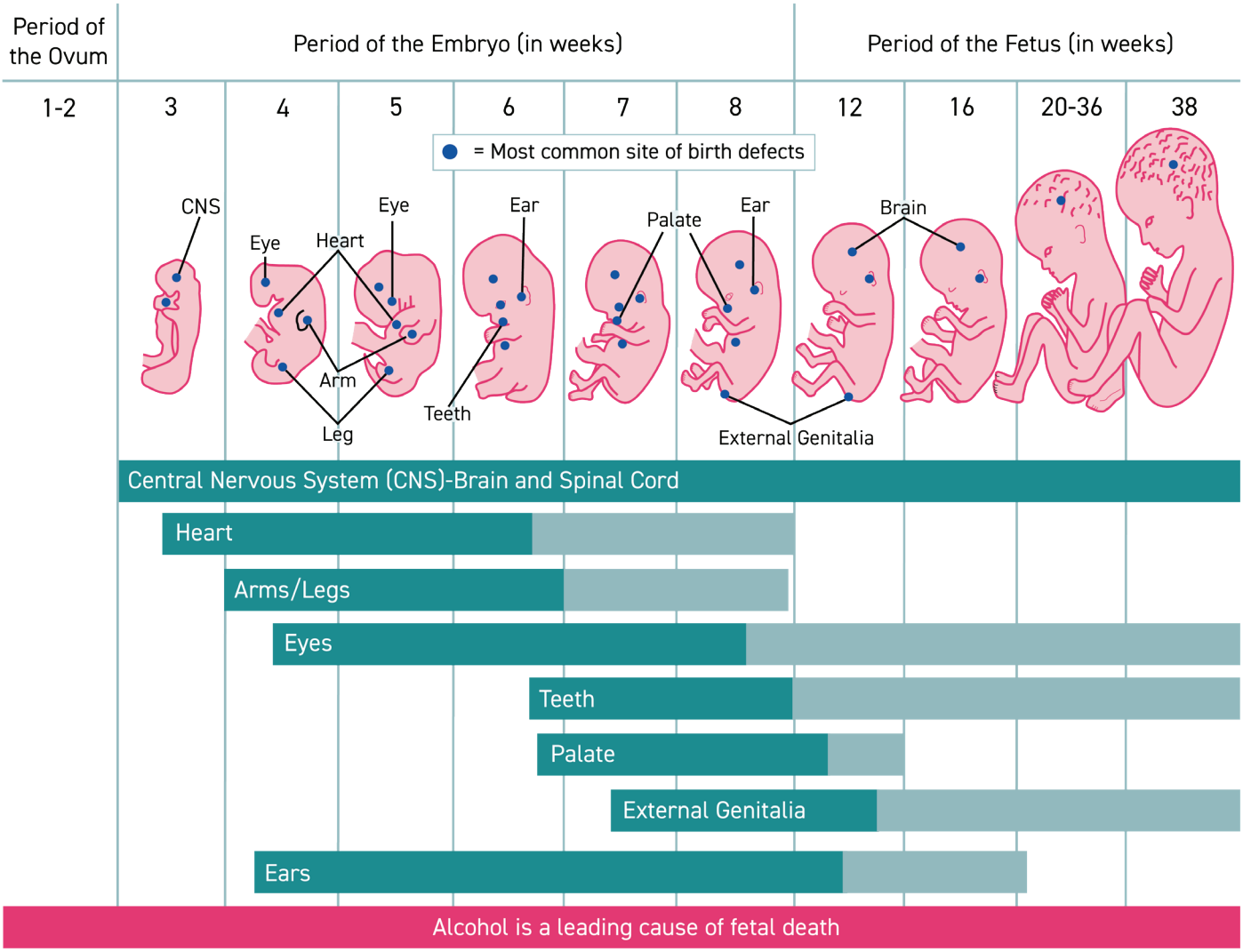

Figure 1.2 Fetal development and vulnerability chart

Adapted with permission from the National Organization on Fetal Alcohol Syndrome.

Nutritional deficits during preconception, pregnancy, and early years of life are serious (Procter et al, 2014). Nutrient depletion of energy and protein at conception will alter pregnancy outcomes. A short span between pregnancies or an early pregnancy within 2 years of menarche will increase the risk for stunting (low height-for-age) or preterm delivery. Underweight is associated with small-for-gestational-age (SGA) births as well as prematurity.

Energy restriction during gestation and lactation impacts the developmental programming of energy balance in the infant. Susceptibility to obesity, incapacity to regulate energy balance, altered leptin and insulin sensitivity, and changes in body composition may result (Reynolds et al, 2015).

Poor iron and folate intakes during pregnancy have been associated with preterm births and intrauterine growth retardation, common in early or closely spaced pregnancies. Use of prenatal folic acid supplements around the time of conception has been associated with lower risks of both autism spectrum disorders and neural tube defects (Surén et al, 2013). Iodine deficiency in utero is also a concern, as it may lead to cretinism.

Stillbirths are another risk. To prevent stillbirths, the following measures are protective: childbirth care; induction for prolonged

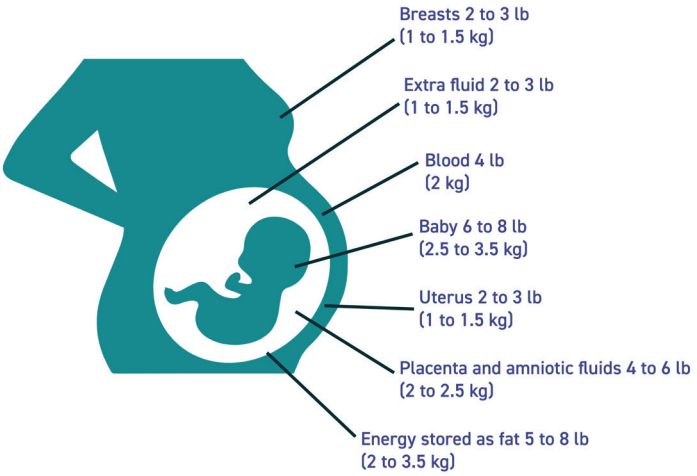

Figure 1.3 Typical tissue weight gains of pregnancy

Adapted with permission from Nutrition Connections, Ontario Public Health Association. Healthy weight gain during pregnancy. Accessed November 5, 2020. www.healthunit.com/healthy-weights-in-pregnancy

Choriocarcinoma

DEFINITIONS AND BACKGROUND

Choriocarcinoma (CC) involves a highly malignant neoplasm that starts in cells of the placenta with a secretion of the pregnancy hormone, human chorionic gonadotropin (β-hCG). CC occurs once in every 20,000 to 40,000 pregnancies and is often asymptomatic except for shortness of breath (Hensley et al, 2014). Fatty acid synthase is a tumor-associated marker found in all CCs. After the initial diagnosis, a careful examination is done to rule out metastasis. CC can be fatal if there is metastasis to the kidney.

CC can be either gestational or nongestational in origin (containing or lacking a paternal chromosome complement, respectively); the androgenetic form is typical (Savage et al, 2017). CC may occur after miscarriage, ectopic pregnancy, full-term delivery, or a molar pregnancy. It is more common among Asian populations.

CC leads to abnormal trophoblast formation. In some, the growth persists and develops into *gestational trophoblastic neoplasia* (GTN), a malignant form of the disease (Wang et al, 2017). Diet affects the development of this type of cancer because the placenta plays a large role in nutrient availability. Patients with CC may have deficiencies in protein, carotene, and vitamin A; more research is needed.

Hydatidiform mole, also called a molar pregnancy, is characterized by an overgrowth of fetal chorionic tissue within the uterus; it may be partial or complete (Wang et al, 2017). In a molar pregnancy, the fetus does not develop at all.

Perturbation of placental functions can limit the transfer of necessary nutrients, alter the production of hormones needed during pregnancy, and allow the undesired passage of xenobiotics to the developing fetus (Fournier et al, 2018). Because phytoestrogens induce biologic responses by mimicking or modulating the action or production of endogenous hormones, genistein isoflavonoids and coumestrol may be protective. In the future, engineered nanomaterials may someday be available for targeted therapy (Fournier et al, 2018); see Figure 13.15.

Most patients with low-risk GTN can be cured by evacuation of the uterus with or without single-agent chemotherapy (Lawrie et al, 2016). The patient should not become pregnant for 1 year after chemotherapy. Surgical excision or dilation and curettage is reserved for acute emergencies. A hysterectomy is rarely indicated but may be needed for some patients under 40 years of age.

Testicular CC is an exceptionally rare cancer in men, potentially asymptomatic but with specific clinical features: skin hyperpigmentation (from excess β-hCG cross-reacting with the α-melanocyte–stimulating hormone receptor), gynecomastia, and weight loss. Pure CC of the testes is an aggressive germ cell tumor that can metastasize to the brain. Although the prognosis for testicular CC has improved with the development of cisplatin-based chemotherapy regimens, cerebral metastases are prone to hemorrhage and are associated with high morbidity (Hoffman et al, 2017). Radiotherapy may be needed to complement radical orchiectomy and chemotherapy to achieve full remission.

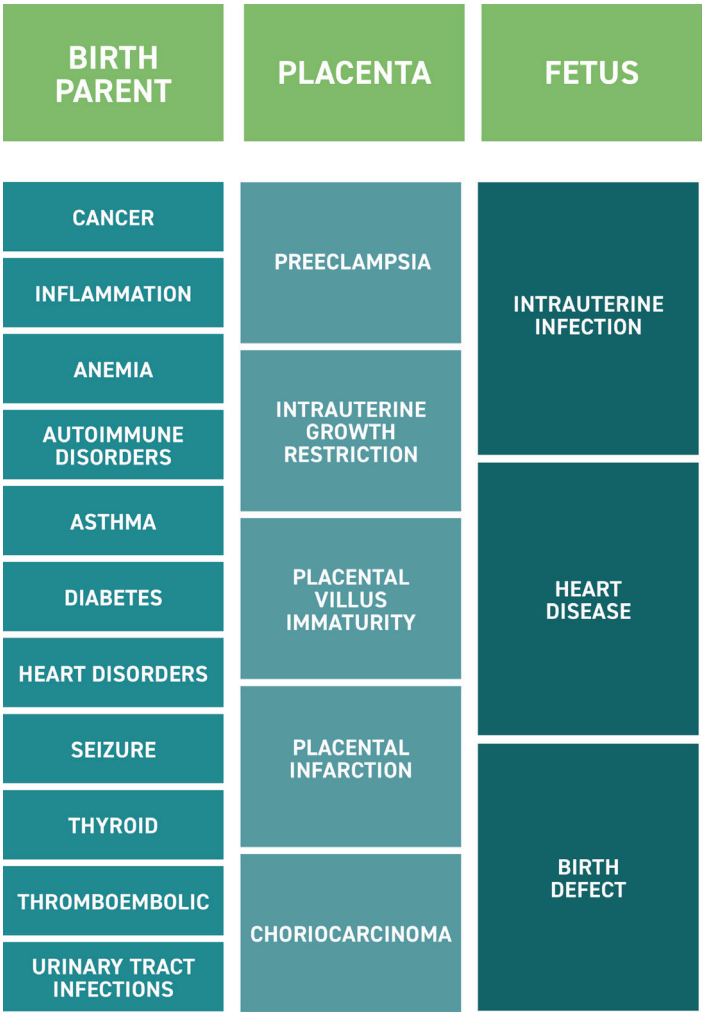

Figure 13.15 Perinatal conditions that can be treated using therapies developed on an engineered nanomaterial platform

Adapted with permission from Fournier SB, D'Errico JN, Stapleton PA. Engineered nanomaterial applications in perinatal therapeutics. *Pharmacol Res.* 2018;130:36-43.

ASSESSMENT, MONITORING, AND EVALUATION

See Appendix B for support information.

ANTHROPOMETRICS

- Height
- Weight
- BMI
- Weight loss

Patient Education: Food Safety

Educate the patient about food safety issues. Discuss safe food handling and preparation, keeping foods at proper temperatures, and reheating foods properly.

NUTRITION CARE PROCESS MINI CASE STUDY

Inadequate Bioactive Substance Intake

Assessment Data

37-year-old female who had a healthy pregnancy 6 months ago. She is still breastfeeding, but her lab values show high levels of beta hCG.[a] Diagnosis of choriocarcinoma. The medical team plans to start chemotherapy soon using methotrexate. BMI[b] is 25. Her diet history is notable for no intake of soy or other foods containing isoflavonoids.

Nutrition Diagnoses (PES)

Inadequate bioactive substance intake related to phytoestrogens as evidenced by food frequency records showing no intake of soy or other isoflavonoids

Interventions

Food and nutrient delivery: Offer recipes and tips for ways to increase the intake of isoflavonoids from soy, legumes, and other foods.

Education: Educate the patient about the role of bioactive substances in isoflavonoids in the prevention of this form of cancer. Educate on food sources of isoflavonoids (soy, legumes, spinach, brussels sprouts, tofu, etc). Provide recipes. Educate about possible nutrition side effects of chemotherapy.

Counseling: Encourage behavioral change of increasing intake of foods with isoflavonoids from 0 servings daily to 2 servings daily. Encourage optimal meal/snack intakes and consuming nutrient-dense foods to help maintain weight throughout chemotherapy treatments.

Coordination of care: Collaborate with interdisciplinary team. Physician to help manage side effects of chemotherapy.

Monitoring and Evaluation

Monitoring: *After 24 hours:* Patient is started on chemotherapy. She consumes ~75% of her dinner meal, which contains tofu.

Evaluation: *After 3 months:* Patient consumes 1 cup of soy milk daily. She incorporates more tofu, legumes, and other sources of isoflavonoids into her diet. Her weight has been relatively stable since starting chemotherapy.

[a] hCG = human chorionic gonadotropin [b] BMI = body mass index

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For More Information

- Cancer Research UK: Persistent Trophoblastic Disease and Choriocarcinoma
  www.cancerresearchuk.org/about-cancer/gestational-trophoblastic-disease-gtd/persistent-trophoblastic-disease-ptd-choriocarcinoma
- MedlinePlus: Choriocarcinoma
  https://medlineplus.gov/ency/article/001496.htm