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Prenatal screening for fetal and obstetric complications: New opportunities and challenges

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This timely issue of *Seminars in Fetal and Neonatal Medicine* is devoted to prenatal screening for major contributors to perinatal morbidity and mortality, including preterm birth, fetal growth restriction, fetal genetic and chromosomal disorders, and structural birth defects. Rapidly evolving technologies are improving our ability to predict and diagnose pregnancy complications using non-invasive approaches, such as ultrasound and maternal blood analysis. This progress in prenatal screening has created new opportunities to provide women more information about the health of their unborn baby, and to offer interventions that may improve perinatal outcomes.

Section A of this edition focuses on prenatal screening for genetic and chromosomal conditions, including carrier screening, non-invasive prenatal testing for aneuploidy, and non-invasive diagnosis of single gene disorders. There is no doubt that this field has undergone the most rapid advances of any area in perinatal medicine in the past decade. The utilization of massively parallel sequencing for cell-free fetal DNA analysis in maternal plasma has created new capabilities for obtaining detailed genomic information about the fetus without the need for invasive testing, disrupting our traditional screening paradigm that focused primarily on the detection of Down syndrome.

Approximately 3% of babies are born with a congenital anomaly and ultrasound screening for structural abnormalities is a well-established component of prenatal care. In Section B, Hui and Edwards summarizes the current standard of care for the routine mid-trimester morphology survey, as well as recent advances in first trimester imaging and fetal magnetic resonance imaging, while Gardiner covers the exciting progress made in fetal echocardiography.

Ultrasound is also an essential screening tool for fetal growth restriction, preterm birth, and complications of multiple pregnancy (Section C). These conditions remain major public health burdens due to their demands on neonatal intensive care facilities and their

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contribution to stillbirth. Effective screening and therapeutic strategies for these conditions are evolving, promising future inroads into these longstanding problems in obstetric care.

Finally, and most importantly, Section D focuses on our therapeutic relationship with the woman and her partner. Preventing poor outcomes is not just about the development of an accurate screening test, but also facilitating informed decision-making. Counseling challenges have escalated with our ability to detect fetal abnormalities and pregnancy complications. Metcalfe discusses one of the most pressing issues related to screening, namely how to provide adequate pre- and post-test genetic counseling to allow couples to make informed decisions that are consistent with their goals and values. And in the event that a fetal abnormality is detected, Hodgson and McClaren affirm that we need to appreciate our influential role in how couples experience this news, so that we better support them through their journey.