<u>Unscreened pregnancy necessitates detailed fetal/maternal obstetric ultrasound, 2D fetal cardiac ultrasound and obstetric spectral Doppler</u> **-** *optimizing the assessment for safe delivery in a community hospital or out of hospital delivery*

O35.1XX2 - unscreened pregnancy
O09.32 - supervision of unscreened pregnancy
Z36.83 - screening for congenital heart disease
O36.513 - maternal care for known or suspected placental insufficiency.
Z36 - detect malformations that alter obstetrical management, site of delivery, aneuploidy risk, and neonatal well-being.

<u>Why detailed fetal-maternal obstetrical ultrasound</u> CPT 76811 ?

Because most non cardiac and cardiac fetal malformations occur in the absence of family history or known risk factors, "every pregnancy must be considered at risk for significant birth defects."
*Diagnostic Imaging of Fetal Anomalies. Nyberg. 2002 p.xii.

Foundational imaging principle - 'every fetus is abnormal till proven otherwise' -
*Beryl Benacerraf, MD. April 29, 1949 - October 1, 2022. Professor of obstetrics, gynecology and reproductive biology and professor of radiology in the Brigham and Women's Hospital Department of Obstetrics and Gynecology.

Approximately 3% of newborns have a recognizable major anomaly and at least 5% will ultimately be diagnosed with a congenital defect. Birth defects are the single most common cause of perinatal mortality in developed countries.

<u>Why universal uterine artery and umbilical artery/vein Doppler and screening for impaired placentation/placenta related adverse obstetrical outcomes</u> - CPT 93975

More than 15% of pregnancies are affected by placenta related adverse obstetrical outcomes necessitating uterine artery Doppler to screen for impaired placentation.
O36.512 - maternal care for known or suspected placental insufficiency.

Preeclampsia and other hypertensive disorders of pregnancy occur in 5-8% of all pregnancies of women who have no known risk factors. https://www.preeclampsia.org/faqs

Uterine artery Doppler is an essential component in determining which patients would best benefit from aspirin treatment and in establishing risk for stillbirth.

Preeclampsia affects 1 in 25 pregnancies in the United States and is potentially life-threatening. Preeclampsia is a leading cause of maternal death worldwide.
*American Heart Association. April 2023.

In each trimester of pregnancy, uterine artery Doppler is an essential component within the evidence based multifactorial Fetal Medicine Foundation algorithm optimizing personalized quantitative preeclampsia risk assessment
_P02.29 - newborn (suspected to be) affected by functional abnormalities of placenta.
_O36.512 - maternal care for known or suspected placental insufficiency.

*Female Reproductive Dysfunction. Mastrolia. Endocrinology. 2020.
*Expert review. Preeclampsia and eclampsia: The conceptual evolution of a syndrome. Erez. AJOG. Feb 2022.
*The competing risk approach for prediction of preeclampsia. Wright. Am J Obstet Gynecol. July 2020
*From first trimester screening to risk stratification of evolving preeclampsia and second and third trimesters of pregnancy: comprehensive approach. Ultrasound Obstet Gynecol. Poon. 2020;55:5-12.

Why universal fetal cardiac ultrasound CPT 76825

The profound majority of congenital heart disease CHD occurs in pregnancies with no risk factors.

Prenatal detection of CHD significantly alters risk of clinically significant genetic abnormalities, obstetrical management and site of delivery.

CHD is the most common of all fetal malformations, responsible for the greatest degree of neonatal morbidity and mortality and the most frequently missed of all fetal malformations.
_ 20-55% of infants with CHD are not diagnosed until after hospital discharge.

2D fetal cardiac with interpretation by MDs accredited in fetal echocardiography increases detection of congenital heart disease CHD to greater than 90-95%.

Accredited Detailed obstetrical ultrasound (CPT 76811) with updated cardiovascular protocols but without 2D fetal cardiac 76825 has less than 60-70% detection rate for CHD. Non detailed obstetrical ultrasound (CPT 76805) has less than 40-50% detection rate for congenital heart disease.
_ it is not the mere performance of ‘outflow tract’ imaging but the detailed knowledge of fetal cardiac pathology, its recognition and the interpretive expertise that is necessary to detect CHD

Isolated congenital heart disease may be the only prenatal detectable abnormality in patients with a pathogenic copy number variant PCNV genetic abnormality. PCNV are not detected by fetal DNA screening.

*Sun. Prenatal detection of critical cardiac outflow tract anomalies remains suboptimal despite revised obstetrical imaging guidelines. Congenital Heart Disease. volume 13, issue 5. Sep/Oct 2018.p748-756.

*Behtiyar and Copel. Improving detection of fetal cardiac of fetal cardiac anomalies - a fetal echocardiogram for every fetus? J Ultrasound Med 2007. 26:1639-1641.
*Levey. Improved prenatal detection of congenital heart disease in integrated healthcare system. Pediatric Cardiology 2013. 34:670 - 679.
*Wu. BMC Pediatric. 2017; 17:117. Chromosomal microarray analysis in the investigation of children with congenital heart disease.