

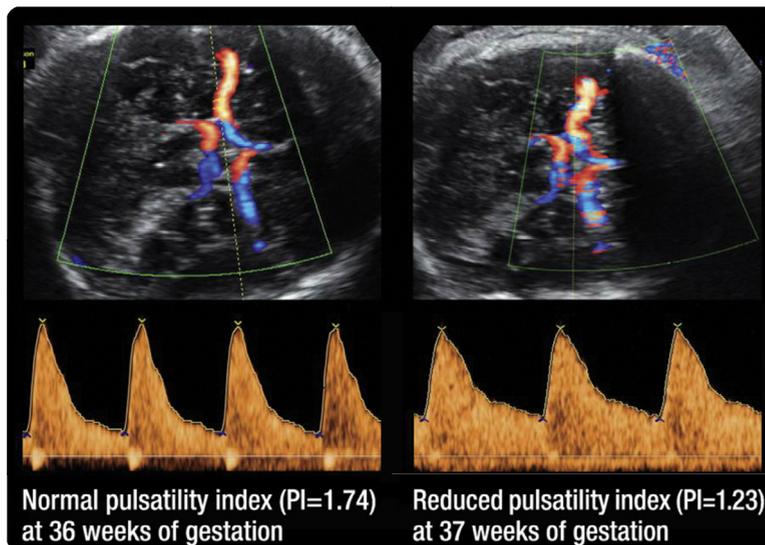
## Doppler of the middle cerebral artery for the assessment of fetal well-being

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**D**oppler velocimetry of the middle cerebral artery (MCA) is a method to assess impedance/resistance to flow in the fetal brain circulation. Vasodilatation of the MCA is considered to reflect a compensatory phenomenon often referred to as the “brain sparing effect.” In this issue of *AJOG*, 3 articles address the value of the MCA pulsatility index and the ratio between such index and the umbilical artery pulsatility index (also called cerebroplacental ratio) to assess the likelihood of admission to the newborn intensive care unit and neonatal complications in small-for-gestational-age fetuses.<sup>1,2</sup> A review addresses the value of the cerebroplacental ratio in obstetrics.<sup>3</sup> These 3 articles also build on previous publications of the Prospective Observational Trial to Optimize Pediatric Health in IUGR (PORTO) Study,<sup>4,5</sup> and other publications.<sup>6-8</sup>

The color Doppler images on this page and on the cover of this issue show the Circle of Willis, a circulatory anastomosis supplying blood to the brain and surrounding structures. The sample volume of the pulsed Doppler is on the MCA, shown in red in both images. Each of the sepia waveforms across the bottom (the spectral Doppler of the MCA) represents a cardiac cycle. The vertical axis is Doppler shift, proportional to blood velocity. The horizontal axis represents time.

Shown in the image on the left is the pulsatility index of 1.74 at 34 weeks of gestation (within normal range). In contrast, the fetus on the right has increased diastolic velocities of the MCA, and the pulsatility index is 1.23. A reduced pulsatility index reflects vasodilation of the MCA. This is an indirect manifestation of hypoxemia, as reported in studies correlating results of the MCA pulsatility index and pH and blood gases obtained by cordocentesis.<sup>9</sup> ■



Color Doppler of the circle of Willis and spectral Doppler waveform of the middle cerebral artery (normal and abnormal). The middle cerebral artery pulsatility index is part of the calculation of the cerebral placental ratio.

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