Perinatal stroke is presented as the ideal human model of developmental neuroplasticity. The precise timing, mechanisms, and locations of specific perinatal stroke diseases provide common examples of well defined, focal, perinatal brain injuries. Motor disability (hemiparetic cerebral palsy) constitutes the primary adverse outcome and the focus of models explaining how motor systems develop in health and after early injury. Combining basic science animal work with human applied technology (functional magnetic resonance imaging, diffusion tensor imaging, and transcranial magnetic stimulation), a model of plastic motor development after perinatal stroke is presented. Potential central therapeutic targets are revealed. The means to measure and modulate these targets, including evidence-based rehabilitation therapies and noninvasive brain stimulation, are suggested. Implications for clinical trials and future directions are discussed.

References

