

The power of teamwork



A young girl with a hemangioma on the side of her face.

An internationally respected team of doctors and researchers from the Medical College of Wisconsin share a vision to provide excellent care for children with [infantile hemangiomas](#), [congenital hemangiomas](#), [PHACE syndrome](#) and [vascular anomalies](#).

This strong partnership between doctors representing medical, surgical and research disciplines is essential since vascular anomalies are complex. Each case is very individualized based on many factors, such as the age of the patient, type of vascular anomaly and its location on the body. Doctors from each of these disciplines work together to accurately diagnose each case and determine the most effective and individualized course of treatment. [Meet our birthmark treatment specialists](#).

One-stop care

Patients see all of the necessary physicians in each visit, reducing the number of trips to the clinic. Each patient is evaluated and treated, as appropriate, by a team of specialists from many different areas of medicine, including [dermatology](#) (skin doctors), [oncology](#) (cancer doctors), radiology (imaging doctors), pathology (doctors who study the cause of diseases), [otolaryngology](#) (ear, nose and throat doctors), plastic surgery, [orthopedic surgery](#), and [ophthalmology](#) (eye doctors). These specialists discuss all treatment options, weighing the risks and benefits of each as a collaborative group to provide a unified opinion on the best [treatment](#) plan. This system prevents patient families from having to make numerous appointments to see each specialist separately and receiving conflicting opinions from the various providers.

Cutting-edge research

The Birthmarks and Vascular Anomalies Center represents a unique collaboration between an institution with a longstanding reputation of providing excellent clinical care for infants—Children's Hospital of Wisconsin—along with the Medical College of Wisconsin, a teaching institution with an emphasis on translational research. The vascular anomalies team is currently conducting [research](#) on the causes and potential cures for [infantile hemangiomas](#). [Paula E. North, MD, PhD](#), is internationally recognized for her landmark research regarding the cell of origin of [hemangiomas](#). This work and subsequent studies have yielded several important clues about what causes [infantile hemangiomas](#) and important new tools for diagnosing them. In addition, medical director [Beth A. Drolet, MD](#), is a leader in the Hemangioma Investigator Group, a multi-institutional clinical research group composed of 11 international sites. These collective research initiatives have provided the rare opportunity to bridge knowledge gained in the laboratory directly to care of infants with [hemangiomas](#).

Superior diagnostics capabilities

Our team has access to state-of-the-art technology and a wide range of resources in [research](#), pathology, radiology and numerous clinical departments. [Paula North, MD, PhD](#), is an internationally recognized expert in the pathologic diagnosis of vascular anomalies. She has developed several specialized tests that aid in the classification of vascular anomalies. She provides an international consultation service.

Highly specialized programs

To provide focused expertise, we offer a [Hemangioma of Infancy Clinic](#), [Laser Clinic](#) and [Surgery Clinic](#).

Paula E. North, MD, PhD

**Professor and Chief (Pediatric Pathology), Department of Pathology and Laboratory Medicine
Medical Director, Department of Pathology and Laboratory Medicine, Children's Hospital of Wisconsin
Director, Children's Research Institute Histology and Imaging Cores
Medical Director, Pediatric Biobank and Tissue Analytical Core, Children's Hospital of Wisconsin**

Dr. North serves as Chief of Pediatric Pathology at the Medical College of Wisconsin and as Medical Director of Pathology and Laboratory Medicine at Children's Hospital of Wisconsin. She is responsible for oversight of all clinical, administrative, research, and teaching aspects of Pediatric Pathology in the Department and directs the CHW Clinical Laboratories. She also founded and now directs 3 research core facilities at the Children's Research Institute that are open to all investigators at MCW and its affiliated institutions. Dr. North's research program and anatomic clinical practice is focused in the area of vascular anomalies; she also serves as a Principal Investigator/Core Director for Histology and Imaging Cores on a Stem Cell Program Project (P01) as well as the Children's Environmental Health Science Center Grant.

Research Interests

- Pathogenic mechanisms in vascular tumors and malformations of infancy and childhood
- Pediatric molecular diagnostics
- Global laboratory medicine - development of sustainable models for telepathology-supported laboratory testing in challenging environments

Professional Background

- Director of Clinical Laboratories and Vice Chief of Pediatric Pathology, Arkansas Children's Hospital, Little Rock, AR (1995 - 2005)
- Assistant Professor of Pathology, University of Arkansas for Medical Sciences (1995 - 2001)
- Associate Professor of Pathology (with tenure), University of Arkansas for Medical Sciences (2001 - 2004)
- Professor of Pathology (with tenure), University of Arkansas for Medical Sciences (2004 - 2005)
- Professor (with tenure) and Chief (Pediatric Pathology), Department of Pathology and Laboratory Medicine, Medical College of Wisconsin (2005 - present)

Educational Background

- University of Virginia - BA in Biology (1974)
- Vanderbilt University - PhD in Molecular Biology (1982)
- Vanderbilt University - post-doctoral fellowship in Physiology, Vanderbilt University (1982 - 1984)
- University of Arkansas for Medical Sciences - MD (1992)
- University of Arkansas for Medical Sciences - residency in Anatomic and Clinical Pathology (1992 - 1995)



Contact Information

Phone: 414-266-2255

Fax: 414-266-2779

[Email Me](#)

Administrative Assistant

Ann Diamond

Phone: 414-266-2255

Email: adiamond@chw.org

Board Certifications

- Anatomic and Clinical Pathology (American Board of Pathology)
- Pediatric Pathology (American Board of Pathology)

Selected Publications

- **North PE**, Waner M, Mizeracki A, Mrak RE, Nicholas R, Kincannon J, Suen JY, and Mihm MC, Jr: A unique microvascular phenotype shared by juvenile hemangiomas and human placenta. *Arch Dermatol*. 137: 559-570-12, 2001.
- **North PE**, Waner M, James CJ, Mizeracki A, Frieden IJ, and Mihm MC, Jr. Congenital nonprogressive hemangioma: a distinct clinicopathological entity unlike infantile hemangioma. *Arch Dermatol*. 137: 1607-1620, 2001.
- Walter JW, **North PE**, Waner M, Mizeracki A, Blei F, Walker JWT, Reinisch JF, and Marchuk DA. Somatic mutation of vascular endothelial growth factor receptors in juvenile hemangioma. *Genes, Chromosomes, and Cancer*. 33:295-303, 2002.
- Sanchez-Carpintero I, Mihm MC, Waner M, Mizeracki A, and **North PE**: Epithelial and mesenchymal hamartomatous changes in mature port-wine stains: morphological evidence for a multiple germ layer field defect. *J Am Acad Dermatol* 50(4): 606-612, 2004.
- **North PE**, Kahn T, Cordisco MR, Dadras SS, Detmar M, Frieden IJ: Multifocal lymphangioendotheliomatosis with thrombocytopenia: a newly recognized clinicopathological entity. *Arch Dermatol* 140(5): 599-606, 2004.
- **North PE**, Waner M, Buckmiller L, James CA, Mihm MC. Vascular tumors of infancy and childhood: beyond capillary hemangioma. *Cardiovasc Pathol* 15:303-317, 2006.
- **North PE**, Mihm MC: Hemangioma of Infancy. *WHO Classification of Tumors, Pathology and Genetics of Skin Tumors*, Lyon, 2006, p. 233.
- **North PE** and Kincannon J: Vascular Neoplasms and Neoplastic-like Proliferations, in *Dermatology*, Second Edition, Bologna JL, Jorizzo JL, and Rapini RP, eds., Mosby, London, 2008.
- Deyrup A, Miettinen M, **North PE** et al. Angiosarcomas arising in the viscera and soft tissue of children and young adults: a clinicopathological study of 15 cases. *Am J Surg Pathol* 33(2):264-269, 2009.
- Pramanik K, Chun CZ, Garnaas MK, Samant G, Mull A, Li K, **North PE** and Ramchandran R. Dusp-5 and Snrk-1 coordinately function during vascular development and disease. *Blood* 113(5):1184-1191, 2009.
- Si-Tayeb K, Noto FK, Nagaoka M, Li J, Battle MA, Duris C, **North PE**, Dalton S, Duncan SA. Highly efficient generation of human hepatocyte-like cells from induced pluripotent stem cells. *Hepatology* 51(1):297-305, 2010.

Patricia E Burrows, MD

Professor, Medical College of Wisconsin
Member, Children's Specialty Group



Clinic Location(s):

Children's Hospital of Wisconsin

9000 W Wisconsin Ave
Milwaukee, Wisconsin 53226

Office Phone: 414-266-4549

Specialty(ies):

Imaging, Pediatric
Interventional Radiology



Board Certification(s):

American Board of Radiology-Certified-Pediatric Radiology
American Board of Radiology-Lifetime Certification-Diagnostic Radiology

Education and Training:

MD: University of Manitoba-Faculty of Medicine, 1972 - 1976

Internship: University of Manitoba-Faculty of Medicine, Pediatrics, 1976 - 1977

Residency: University of Manitoba-Faculty of Medicine, Diagnostic Radiology, 1977 - 1980

Fellowship: The Children's Hospital of Winnipeg, Ped Radiology, 1980 - 1981

Fellowship: Boston Children's Hospital, Ped Radiology, 1981 - 1982