



## Discover Generics

Cost-Effective CT & MRI Contrast Agents



FRESENIUS  
KABI

WATCH VIDEO

# AJNR

## **Pediatric neuroradiology: a perspective.**

D C Harwood-Nash

*AJNR Am J Neuroradiol* 1992, 13 (2) 421-422

<http://www.ajnr.org/content/13/2/421.citation>

This information is current as  
of June 21, 2025.

# Pediatric Neuroradiology: A Perspective

Derek C. Harwood-Nash<sup>1</sup>

From the Division of Pediatric Neuroradiology, Hospital for Sick Children, Totonto, Ontario

"A likely impossibility is always preferable to an unconvincing possibility"

Aristotle. *Poetics*: 24

In the evaluation of a *developing* organ system, it is a challenge to recognize the continuously changing state of normal, identify variations of normal, appreciate abnormalities, and assess their significance. So it is in pediatric neuroradiology (1), exemplified by the trite, often overused aphorism—a child is not simply a small adult. The very complexity of the developing central nervous system (CNS) demands a practical approach to learning its developmental stages and variations of morphologic arrests and acquired insults, the derangements that ultimately, and evolve the associated clinical manifestations.

Modern imaging techniques demonstrate in exquisite detail the CNS anatomy and any abnormality present. We have come a long way since pediatric neuroradiology began as a persuasion 24 years ago (Figs. 1 and 2). We now show the pathology well. The clinical challenge is to do so safely, in often tiny people with fragile physiologies. We must modify, to pediatric specifications, equipment design and construction, catheters, probes, needles, contrast agents, support systems, sedation and anaesthesia, MR coils, imaging doses, and pulse parameters, lest we place the children at increased risk to achieve reduced diagnostic benefit.

The developing CNS has unique features that modify its reaction to common insults. Because it is developing, insults to the CNS may cause morphologic deviations from the planned blue-

print, leading to bizarre absences and hypoplasias or novel interrelationships of component parts. Because the developing CNS has different structure, it adapts to pressure differently. The presence of sutures, for example, provides a "safety valve" for ameliorating the consequences of altered cerebrospinal fluid dynamics or raised intracranial pressure. The developing brain may be either remarkably resilient or inordinately sensitive to insult. Large insults, if incurred very early, may be well compensated, whereas apparently minor alterations in myelination may lead to profound permanent functional deficits.

The neurodiagnostic challenge is to identify anomalies earlier and more accurately, to understand the differences in the way the immature brain responds to insults compared with the adult



Fig. 1. Pneumoencephalogram. A sagittal tomograph of the midline structures of the posterior fossa outline by air and demonstrating the surface anatomy to a remarkable degree. Note the large suprapineal recess curling around the splenium of the corpus callosum.

<sup>1</sup> Address reprint requests to D. C. Harwood-Nash, Division of Pediatric Neuroradiology, Hospital for Sick Children, 555 University Ave., Toronto, Ontario M5G 1X8.

Index term: Pediatric neuroradiology

AJNR 13:421-422 Mar/Apr 1992 0195-6108/92/1302-0421

© American Society of Neuroradiology



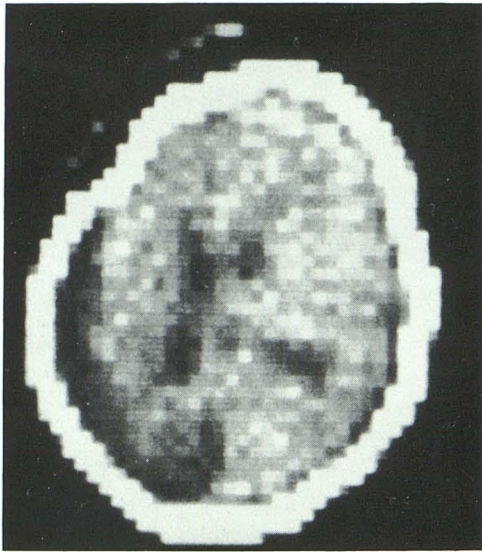


Fig. 2. A historic CT of a premature head. A  $64 \times 64$  matrix EMI scan done in 1974, then the smallest patient to date (1500 g), showing a left cerebral hemispheric prenatal atrophy in this newborn premature infant (note EMI scans were logically looked at from above).

brain, and thus to recognize in the unique, often peculiar imaging features of the young, nothing more than the characteristic reaction of the immature brain to the same insults that are easily recognized by different "footprints" in adults.

Pediatric neuroradiology is an essential part of the education of the neuroradiologic trainee. A working knowledge of the management of CNS disease in children is essential to the daily practice of most neuroradiologists. So too is practical expertise in befriending, cajoling, restraining, and sedating the helpless frightened child. Above all else, there must be up-to-date and broad knowledge of the clinical and radiologic features of pediatric neuroradiologic disease (2-4). Without such knowledge, there is grave possibility of misidentifying normal variation as disease or, conversely, of failure to appreciate the clinical significance of subtle, potentially lethal changes on the images.

To help a child, the pediatric radiologist or neuroradiologist must know enough to distinguish the true likely impossibility from the unconvincing possibility.

## References

1. Harwood-Nash DC, Fitz CR. *Neuroradiology in infants and children*. St. Louis: Mosby, 1976
2. Barkovich AJ. *Pediatric neuroimaging*. New York: Raven Press, 1990
3. Cohen MD, Edwards MK. *Magnetic resonance imaging of children*. Philadelphia: Decker, 1990
4. Zimmerman RA, Bilaniuk LT. Pediatric central nervous system. In: Stark DD, Bradley WG Jr, eds. *Magnetic resonance imaging*. New York: Raven Press, 1988:chap 30