



INCUBATOR PUBLICATIONS

1. A. Panigrahy, S. Blüml
"Advances in magnetic resonance neuroimaging techniques in the evaluation of neonatal encephalopathy"
Top Magn Reson Imaging. 2007 Feb;18(1) :3-29.
Magnetic resonance (MR) imaging has become an essential tool in the evaluation of neonatal encephalopathy. Magnetic resonance-compatible neonatal incubators allow sick neonates to be transported to the MR scanner, and neonatal head coils can improve signal-to-noise ratio, critical for advanced MR imaging techniques.
http://www.ncbi.nlm.nih.gov/pubmed/17607141?ordinalpos=6&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum
2. Ariel Prager et al.
"Magnetic resonance imaging of the neonatal brain"
Indian J Pediatr 2007 ;74 :173-184
Neonatal magnetic resonance (MR) imaging is rapidly becoming the preferred modality for the evaluation of central nervous system disorders in the newborn. Recent literature supports the value of this imaging technique in diagnosing ischemic, hemorrhagic and infectious disease processes in the premature and full term neonatal brain. Recent data in premature newborns with neurological injury also suggest a role for framework and overview on neonatal brain. Recent data in premature newborns with neurological injury also suggest a role for MR imaging in determining long-term neurodevelopmental outcomes. This review articles provides a framework and overview on neonatal MR imaging techniques and examines the literature or radiological disease patterns and prognostic implications in common neurological disorders.
<http://www.springerlink.com/content/f401660158117375>
3. Beth Miller
"MRI scans in premature infants can predict future developmental delays"
St. Louis, August 16th, 2006
A Washington University pediatrician at St. Louis Children's Hospital has found that performing MRI scans on pre-term infants' brains assists dramatically in predicting the babies' future developmental outcomes.
Contact: millerbe@wustl.edu, Washington University School of Medicine
http://www.innovations-report.de/html/berichte/medizin_gesundheit/bericht-69277.html
4. Laura A. Stokowski, RN, MS et al.
"Ensuring Safety for Infants Undergoing Magnetic Resonance Imaging"
Advances in Neonatal Care 2005, Vol. 5, No. 1; p 14-2
Magnetic resonance imaging (MRI) is a powerful and versatile diagnostic tool. Applications of MR technology are rapidly expanding for all patient populations, including infants receiving newborn intensive care. Millions of MR examinations have been conducted without incident or harm, yet rare accidents in the MR environment continue to occur. The infant is vulnerable to many of the potential hazards of MRI, including projectile accidents, radiofrequency electromagnetic field effects, noise hazards, physiologic instability, and adverse effects of transport, positioning, handling, and sedation. The MRI-compatible incubator is a promising means for safe imaging of smaller and less stable infants than previously possible. Proper education of staff and meticulous attention to detail in preparing the infants for MR examinations are the keys to safety during neonatal MRI.



5. Stefan Bluml et al.
"MR Imaging of Newborns by Using a MR-Compatible Incubator with Integrated Radiofrequency Coils – Initial Experience"
Radiology 2004; 231:594-601; © 2004 RSNA
To meet the needs of term and preterm neonates undergoing magnetic resonance (MR) imaging, an MR-compatible incubator with air, temperature, and humidity regulators and integrated radiofrequency coils was evaluated. Nine brain, tow cardiac, and two pelvic examinations were performed by using a 1.5-T clinical MR imaging unit. The axillary temperature of the newborns varied by less than 0.8°C, their vital signs remained stable, and no complications were encountered. The diagnostic quality of images obtained with the MR-compatible incubator was superior to that of images obtained with the standard MR imaging equipment. The use of an MR-compatible incubator for examinations of ill neonates is feasible and safe and yields excellent MR images.

6. Merlina Trevino
"Newborns breathe easy in customized MR incubator"
Diagnostic Imaging Online July 7, 2004;© 1996 – 2004 CMP Media LLC, a United Business Media company
One size does not fit all when it comes to imaging newborns. Customized MR-compatible incubators with integrated head and body radio-frequency coils designed for neonates proved to be safe and provided higher quality images than standard imaging equipment, according to a study published in the May issue of Radiology. MR imaging for newborns has required lengthy, intensive preparations, and many systems come with RF coils designed for adults. Yet for many applications, in particular soft-tissue imaging, MR is simply the best tool, said lead researcher Stefan Blüml, Ph.D., an associate professor of radiology research at the University of South California Keck School of Medicine. Researchers used the incubator with 13 neonatal patients already scheduled for an MRI exam who ranged in age from four to 12 weeks. Exams included nine brain, two cardiac, and two pelvic. Patients undergoing brain imaging also had MR spectroscopy performed. All brain MRI and MRS images were compared to images of six age-matched controls performed with standard equipment.

7. Laurie Volkin and Richard S. Dargan, Contributing Writers ASTR
"MR Incubator Creates Safe Imaging Environment for Newborn"
NewsWire May 05th, 2004
An incubator that is compatible with magnetic resonance is safe for examinations of ill newborns and yields excellent MR images, according to a new study. MR imaging is the most desirable imaging test for many newborns because there is no exposure to radiation, according to researchers. However, many sick newborns cannot undergo MR because of concerns for their safety during transport and during the procedure.

8. Shalmali Pal
"MRI delineates complexities of preterm infant brain"
April 30th, 2004
*Investigators have successfully used imaging on adults who survived preterm birth; neurological scans performed on infants, while they are still in the danger zone, is much trickier. MRI may offer the best way to effectively diagnose certain pathologies in these children. MRI incubator: "There have been several attempts to overcome the problem of imaging the neonate, including dedicated scanners on neonatal intensive care units," wrote Dr. Elspeth Whitby from the section of academic radiology at the University of Sheffield and the Royal Hallamshire Hospital, both in Seffield. "However, (these scanners) are not widely available and may be restricted in their image sequences."
<http://www.auntminnie.com/index.asp?sec=ser&sub=def&pag=dis&ItemID=61510>*



9. Laurie Barclay, MD Pediatrics
"MRI-Compatible Incubator Allows High-Quality Neonatal Imaging"
February 11th, 2004
A magnetic resonance imaging (MRI)-compatible incubator affords safe and good- to excellent-quality MRI in neonates, according to the results of a study published in the February issue of Pediatrics. "MRI of the neonate is important clinically, because this group of patients often has complex and multiple problems due to prematurity and developmental abnormalities," write Elspeth H. Whitby, FFDRCSI, from the University of Sheffield, and colleagues. "MRI usually involves moving neonates away from their controlled environment to the scanner." (113:e150-e152)
<http://www.medscape.com/viewarticle/468948>
10. Stephan G. Erberich et al.
"Functional MRI in neonates using neonatal head coil and MR compatible incubator"
NeuroImage 20, 2003: p 683-692; © 2003 Elsevier Inc.
Structural and functional magnetic resonance imaging of the newborn brain is a complex and challenging task. Term and preterm neonates require a controlled microenvironment and close monitoring during the MRI study to maintain respiratory and cardiovascular functions, body temperature, and fluid and electrolyte homeostasis. In addition, to minimize motion artifacts, most neonates also need to be sedated, which carries the risk of respiratory depression compromising the neonate's ability to maintain appropriate ventilation and oxygenation during the procedure. Finally, because of their small head size, the use of the standard MR head coils results in suboptimal picture quality in the neonate. Thus, these limitations affect our ability to obtain both high quality structural and functional MRI studies. To overcome these difficulties, we have utilized an MR compatible incubator with a built-in radiofrequency head coil optimized for the neonatal brain volume. In this study we demonstrate that functional MRI and high-resolution structural MRI of the newborn brain can be achieved with this novel design. The use of this equipment offers potential for studying the development of the preterm and term neonatal brain and obtaining state-of-the-art, high-resolution structural and functional imaging in this most vulnerable patient population.
11. Elspeth H. Whitby et al.
"Ultrafast Magnetic Resonance Imaging of the Neonate in a Magnetic Resonance-Compatible Incubator with Built-in Coil"
Pediatrics Vol. 113, No. 2, February 2004, pp. e150-e152. (in the enclosure)
12. M. Feijen, R N, M.J.G. Plasmans, R N
"Intrahospital transport to the MR Imaging of the critically ill neonate"
(in the enclosure)
13. Rangmar Goelz, Eva Bültmann, Thomas Nägele
"First Experiences with Magnetic Resonance Imaging of Neonates Using a Magnetic-Resonance-Compatible Incubator with a Built-in Coil"
(in the enclosure)
14. Dr. Katrin Klebermass, Dr. Peter Brugger, Prof. Arnold Pollak,
Prof. Daniela Prayer, MD Zsófia Rona, Prof. Manfred Weninger
"Comparison of neonatal MRI examinations with and without an MR-compatible incubator" *(in the enclosure)*