NEONATOLOGY TODAY

News and Information for BC/BE Neonatologists and Perinatologists

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IN THIS ISSUE

Upcoming Medical Meetings

(See website for additional meetings)

NEO: The Conference for Neonatology
Feb. 21-24, 2013; Orlando, FL USA
www.neoconference.com

SR2.0: Speciaity Review in Neonatology
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2nd Evidence-Based Neonatology Conference
Mar. 13-16, 2013; Cairo, Egyp
www.ebneo2013.com/

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Recruitment Ads on Pages 3, 9

Premature Complete Closure of Ductus Arteriosus: What We Need to Know? Case Report and Review of Literature

By Suresh Khanna, MD

Abstract

Premature fetal ductal closure is an uncommon, but serious medical condition. It can lead to right ventricular hypertrophy, pulmonary hypertension, heart failure, hydrops and even death. Most cases are idiopathic, but use of (nonsteroidal anti-inflammatory drugs) NSAIDs during pregnancy (>30wks) are reported to be associated with premature ductal closure.

Even use of Betamethasone for preterm labor is associated with transient vasoconstriction.

Antioxidents and anti-inflmmatory chemicals like polyphenols and flavinoids found in food and beverages have shown to have vasoconstrictive effects on ductus arteriosus. Lots of health foods like green tea, herbal tea, mate tea, grapefruit, etc. are rich in polypheniols and flavinoids. Many of these beverages and foods are sold as “diet foods” and consumed by health-conscious young women in the child-bearing age group. Fetal echos are done around 18-20 weeks. Many young women who consume such products have fetuses who are at-risk for premature ductal closure. The health care provider needs to be aware of the impact of consuming certain foods and drinks on ductus arteriosus; timely diagnosis and intervention can prevent significant morbidity and mortality. Here we present the case of a patient of Chinese descent with premature ductal closure. A literature review also follows.

“Premature fetal ductal closure is an uncommon but a serious medical condition. It can lead to right ventricular hypertrophy, pulmonary hypertension, heart failure, hydrops and even death.”

Case Report

A 3410 gms., 36 wks Late Preterm Large-for- Gestational-Age (LGA) infant delivered by caesarean delivery for Category II tracings with poor variability, to 31 year-old gravida 2 para 1 mother of Chinese descent, with poorly controlled pregestational diabetes (HbA1C 9.2), GDMA II on Insulin. The mother was on Albuterol for asthma and prenatal vitamins. She denied taking any painkillers / steroids for asthma during pregnancy. She admitted occasionally drinking green / herbal tea. She had Fetal ECHO performed at 20 weeks gestation because the mother's poorly controlled diabetes; the echo result was reported normal. No additional echocardiogram was done.

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Infant required resuscitation in delivery room and was given positive pressure ventilation (PPV); Apgar score 3/7/8 at 1/5/10 minutes respectively. However, the infant continued to remain dusky despite being on 100% oxygen and was placed on CPAP - 6 cm of H_2O. Preductal (Right arm) Oxygen saturation was in low 90s (91-93%), and post ductal in the mid-80s.

The infant received Surfactant and was placed on mechanical ventilator without much improvement. Right arm oxygen saturation was in the 88-91% range and Lower limb - 77-83% range. A sepsis work-up was performed, and the infant was started on Ampicillin and Gentamicin. The infant had transient hypoglycemia, and was started on dextrose 12.5%.

Infant blood count was significant for Thrombocytopenia requiring platelet transfusion and chest X-Ray showed bilateral streaking and an enlarged heart, Blood pressures: Right arm - 80/40, Lower limb-87/44. No hydrops noted on physical examination.

A Bedside Echocardiogram (ECHO) performed at about 3 hours of life showed: Persistent Pulmonary Hypertension (PPHN); Tricuspid Insufficiency (TI); Dilated Right Ventricle (RV) with decrease function; thickened ventricular septum and Dilated Right atrium (RA) with R→L shunt at patent foramen ovale (PFO) level, no Ductus Arteriosus seen. The infant was started on Dopamine drip of 5 mcg/kg/minutes, and was transferred to the Tertiary care center. The infant was placed on inhaled nitric oxide (iNO) of 20 ppm with immediate improvement and was weaned off iNO in <48 hours to N-CPAP. The infant transferred back to referring hospital on CPAP. The infant stayed for 2 weeks in the hospital with feeding issues. A repeat ECHO done prior to discharge showed improving cardiac function, but still had RV and septal hypertrophy. Clinically, the was infant doing well on room air, and was discharged home with follow-up appointments.

Discussion

Fetal ductus arteriosus acts as a shunt to bypass high resistance pulmonary vascular system by diverting the oxygenated blood from the placenta to systemic circulation. It is a connection between the pulmonary artery and descending aorta distal to the origin of left subclavian artery. During fetal circulation 80-90% of right ventricular output is shunted via patent ductus into the descending aorta and the rest (10-20%) to ascending aorta through patent foramen ovale. During the fetal life, right ventricular pressure is very high due to fluid filled lungs.[1, 2, 3]

Constrictions of ductus arteriosus in the fetus is a rare and worrisome clinical entity in view of possible hemodynamic consequences associated with increased mortality and morbidity.[4]

Patency of ductus during fetal life is maintained due to the combined effect of high levels of prostaglandin especially PGE_2,[5] low arterial PO_2 and nitric oxide. In the preterm infant with Ductus Arteriosus (DA) NO is the primary mediator of ductal patency and its activity is augmented by Prostaglandins especially PGE_2. Conversely, prostaglandins are the primary mediator of Term fetal DA, and the contribution of NO appears less significant. With increasing gestational age the ductus arteriosus becomes less sensitive to dilatory effects and more sensitive to constrictive effects of various chemicals.[6, 7] High circulating levels and ductal synthesis of Prostaglandins especially PGE_2 are responsible for a strong

vasodilatory effect. This seems to be the reason for increased sensitivity of the more mature fetus DA (>30wks) to the inhibitory effect of indomethacin (Cox 2 inhibitor).

The mechanism by which low oxygen maintains ductus patency is an area of research; decrease of fetal Ductus Arteriosus Smooth Muscle Cells (DASMC) cytosolic Ca2+ levels seems to be responsible for patency of ductus.[8,9]

Most cases of premature ductal closure are idiopathic.[10] Enzyme cyclo-oxygenase (Cox-1& 2) maintains the production of Prostaglandin E-2. Use of Cox 2 inhibitors like indomethacin, NSAIDs, steroids, etc. causes constriction of the ductus especially during the later part of pregnancy. Ductal sensitivity to COX inhibitor increases with increasing gestational age (especially >30 weeks).[6, 11] Ductal constrictions start within hours of its administration and may last for a few weeks. There are multiple case reports showing transient ductal constrictions have been noted in about 50% of infants whose mothers were treated with indomethacin for preterm labor.

Wassersterum et al[18] have demonstrated the constrictive effect of Betamethasone within hours of its administration. Animal studies have shown vasoconstrictive effects of methylxanthines (coffee). Maternal consumption of coffee during pregnancy could be a risk factor.[9, 12]

Antioxidants and anti-inflammatory chemicals like polyphenol and flavonoids found in foods and beverages have been shown to have vasoconstrictive effects on ductus arteriosus (Cox 2 inhibitor). Green tea and black tea are found to be very rich in polyphenol. Resveratol, a polyphenol compound found in grapefruit / red wine is known for its antioxidant, anti-inflammatory, antithrombotic actions. It's known to decrease production of arachdonic acid, thus decreasing the production of prostaglandins needed for the patency of ductus arteriosus. Mate tea, a regional beverage consumed in South America for its anti-inflammatory, antioxidant effect, is also rich in polyphenol compounds. Dark chocolate is rich in flavonoids. Even orange juice is reported to be rich in polyphenol. All these foods and beverages -- especially, green tea and herbal tea were consumed by these pregnant women.[13, 14]

Zielinsky et al[13,14] have demonstrated ductal constrictions in 41 fetuses beyond 30 weeks gestation, whose mother had consumed polyphenol rich food (green tea, Indian tea, dark chocolate, orange juice, grapefruit juice, etc.). Doppler echocardiographic and histopathological examinations done in experimental studies in Corriedale Fetal Lambs 1 week after the consumption of concentrates of green tea, mate tea and grape juice have shown the constrictive effect on ductus arteriosus versus no significant effect on control group. The same group examined 102 fetuses exposed to polyphenol-rich food (daily maternal consumption >1089mg) and concluded ductal flow velocities and RV/LV ratios to be higher in the 102 exposed versus 41 non-exposed fetuses.

Zielinsky et al. (on-going study) have shown a decrease in ductal flow velocities and RV/LV ratios in patients consuming a decreased amount of polyphenol-rich food.

Intrauterine ductal constriction is associated with an increase in the pulmonary artery muscular layers leading to increase in pulmonary vascular resistance which may lead to pulmonary hypertension, dilation of pulmonary artery trunk, right atrium, right ventricle, tricuspid regurgitation, and pulmonary valve insufficiency, right ventricular dysfunction, resulting in heart failure, hydrops and even intrauterine death. Echocardiographic criteria for ductal constriction will show increase in ductal velocity and complete occlusion will show the absence of ductal flow.[2, 4, 15, 16]

Postnatal symptoms will depend upon timing of delivery (preterm vs. full term) and ductal constriction or ductal closure.[4, 17]

"Neither the incidence nor the prognosis of premature ductus closure is known. Approximately one third of fetuses are stillborn and live newborns present with pulmonary hypertension and respiratory distress. Timely diagnosis and treatment will result in complete recovery in 2-3 weeks in most of the cases."

In our case, the mother also had a history of poorly controlled diabetes so fetal ECHO was done at 20 weeks which was reported normal. The mother also had a history of asthma and was using Albuterol. She denied using steroids for asthma and NSAIDs, but admits using herbal / green tea occasionally. The infant was delivered at 36 weeks and remained cyanotic even on 100% CPAP. Pulmonary Hypertension was suspected (Congenital Heart Disease was not considered because of normal Fetal ECHO). A Post Natal ECHO done within 3 hours confirmed pulmonary hypertension with right ventricular hypertrophy, tricuspid regurgitation, increased right side pressure and no ductal flow. The infant responded well to nitric oxide treatment and was weaned off nitric oxide in <48hours. This seems to be a case of mild to moderate PPHN probably due to preterm delivery.

Use of indomethacin, NSAIDS is well-documented to be associated with premature ductal closure.[19, 20, 21] But the role of coffee (methylxanthines), foods and beverages rich in polyphenol and flavonoids is under intense investigation.[14]

Green tea, herbal tea, caramel tea, grapefruit juice and dark chocolates consumption is on the rise because of their beneficial health effects.

Neither the incidence nor the prognosis of premature ductus closure is known. Approximately one third of fetuses are stillborn and live newborns present with pulmonary hypertension and respiratory distress. Timely diagnosis and treatment will result in complete recovery in 2-3 weeks in most of the cases.

Antenatal diagnosis and timely delivery (premature) may be associated with reversal of pathophysiology and favorable outcomes.

This knowledge should alert the Obstetricians / Family Physicians and they should start obtaining detailed dietary history aiming to decrease the consumption of polyphenol, flavonoid-rich food (which are extensively use for weight loss programs and health clinics), especially during third trimester. The index of suspicion and timely intervention and diagnosis can prevent severe morbidity and mortality.

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Health Care Social Media: Joining the Online Revolution

By Farris K. Timimi, MD

There is a marked evolution occurring in health care, and many of us who are not online are excluded. This evolution reflects two broad trends, and the overlap of these two trends defines two seemingly discordant threats and an exciting opportunity that spans arenas of clinical practice, research and education.

The first broad trend reflects the overwhelming impact of data. Practitioners in all fields are truly inundated in clinical data, and the rate and volume of that inundation continues to increase at a marked pace. We are on track to have 22 million citations listed in *Pub Med*, with a new citation being added every minute, reflecting over 3,000 currently referenced journals.[1] For my area of practice, advanced heart failure and transplant cardiology, the National Guideline Clearinghouse lists 497 guidelines that reference heart failure that I may review.[2] Moreover, this ocean of data available is becoming increasingly transparent and more broadly available to patients as well as providers. This data transparency is fostering a new definition of the patient provider compact, one that has shifted from an historic unidirectional instructional conversation from a provider to a patient, to one that is truly more bidirectional and reflective of real engagement.

"There is a marked evolution occurring in health care, and many of us who are not online are excluded. This evolution reflects two broad trends, and the overlap of these two trends defines two seemingly discordant threats and an exciting opportunity that spans arenas of clinical practice, research and education."

We are no longer the only experts in the room. More and more, our patients bring their knowledge and lived experience to the table.

The second broad trend centers on time. The progression in volume and complexity of paperwork continues to represent a daunting time challenge, now consuming one-third of a physician's day.[3] For residents in training, the challenge is even more striking, with medical documentation now consuming six hours of their workday,[4] which represents a nearly two-fold increase in time spent by residents in training on this particular task over the last twenty years.[5]

As our time is being consumed by non-patient care activities, our patient's time is spent more and more often online-and the time they spend online is more often spent seeking health care information. At present, the third most common use of the Internet, after Internet search and e-mail is searching for health care information.[6] Indeed, 61% of us seek online medical information or support (for comparison, 58% of American adults have a library card [8]). The most common research questions focus on specific diseases, specific treatments and reviews and references for doctors.

Where we spend time online has evolved as well, into a more social dynamic. Worldwide we spend in excess of 110 billion minutes daily in social media sites, which now represents approximately 22% of all time spent online-literally one in five minutes spent on the Internet.[9]

Our patients are spending more and more time online, often in social media platforms, and while they are online they are focusing more on health care information and support. Yet all too often, we as providers are reluctant to meet our patients there, with risk adverse concerns that focus on reimbursement and litigation. Frankly, the greatest risk we face as providers is not participating at all.

How we engage with them needs to fill one of two operational needs, from the patient's perspective. It needs to either reflect our capacity to provide content creation of relevant information or content curation and direction. Doing so creates a scalable archived resource that reaches well beyond the confines of geography or time.

Before beginning your online endeavors, your first step should be to review your organizational social media policy and guideline statement, or if they do not exist yet, develop them. Then, carefully consider and define your operational needs and your goals, and ensure that you choose social media tools that will most aptly meet those needs. Once you have chosen your specific tools from the tool set and created your accounts, be sure to review and be familiar with your privacy settings, and plan to re-review them on a regular basis. Be comfortable with the "rules of the road" before driving; our Mayo Clinic Center for Social Media [10] provides the online version of social media drivers training, and can serve as a good resource. Finally, begin your participation in any new site by lurking, you really can learn a great deal by observing before you participate.

Once you are online, try to be authentic, be professional and be respectful. Fundamentally adhere to the Health Insurance Portability and Accountability Act privacy rules. While the majority of HIPAA violations occur in the elevator and not online, online participation has the capacity to leverage any transgression to a much wider and a truly archived audience.

Before you make your first post, pause and review these three questions.

1. Who am I posting this to-who is my online audience?
2. Does my post contain language that is appropriate for all ages?
3. Am I adding material of value to an ongoing conversation?

"There is real power in participating with our patients as they walk on their journey through illness to recovery. Doing so online allows you to create content that can be archived and can be scaled and leveraged at little cost, and can extend the reach of your work beyond geographic and time constraints."

Some fundamental ground rules that are universally applicable regardless of the social media tool that you chose:

- Don't practice on the Internet, regardless of your good intent.
- Always surmise that HIPAA applies.

You will be asked specific medical questions-it is best to frame your answer in a general sense, as you will not have access to specific relevant medical data, i.e., "While I can not comment on your case, in general we recommend patients recheck blood work after beginning an ACE inhibitor."

- Corporate logo in your username is a no go.
- Adding a disclaimer is probably saner.
- Speak on your behalf, not that of staff.

In general, it is critical that you separate your online personal brand from that of your organizational online personal brand, i.e., "Tweets mine, not Mayo's." Moreover, using your corporate logo in your online user profile creates the image that you speak on behalf of your organization, as opposed to your own behalf.

No matter how careful you may be, errors will occur. That is why it is critical that you develop social media orientation and training for your new and current employees and an organizational social media policy; your employees and coworkers are online already, and their errors may well impact you or your organization. Provide them with the tools they need to serve as an asset instead of a liability. Blocking access while at work will not achieve this goal; moreover, doing so does not address their online presence at home and it does not address ubiquitous use of smart phones. Fundamentally, view mistakes that occur as learning opportunities, not a rationale for entrenchment.

There is real power in participating with our patients as they walk on their journey through illness to recovery. Doing so online allows you to create content that can be archived and can be scaled and leveraged at little cost, and can extend the reach of your work beyond geographic and time constraints. Doing so with integrity allows you to be a content resource for your online community; when members of that community transition to becoming patients, they will view you as the resource they will seek.

Our patients [Editor's note: or patient's parents] are online. We should be there with them.

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Letters to the Editor

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Medical News, Products & Information

FDA Clears INOMAX® DS_{IR} to Connect with Hospital Health Information Systems

INOMAX® Drug-Delivery Systems Now Compatible with 60 Respiratory Care Devices.

Ikaria, Inc., a biotechnology company focused on developing and commercializing innovative therapies for critically ill patients, on November 13th announced that the Center for Devices and Radiological Health (CDRH) branch of the US Food and Drug Administration (FDA) has granted 510(k) clearance for a software upgrade to enable connectivity of the INOMAX® DS_{IR} drug delivery system with hospital health information systems.

This connectivity allows data regarding INOMAX® usage to be transmitted directly to electronic medical records where it can easily be viewed at computer stations to reduce charting time, avoid transcription errors, and improve billing efficiency. This feature, which is aligned with the effort by major health systems to automate and capture patient data, also facilitates reimbursement for INOMAX usage.

Additionally, the FDA has cleared three new, non-invasive respiratory care devices for use with the INOMAX® DS and DS_{IR} drug-delivery systems -- the Fisher & Paykel Healthcare Infant Circuit Nasal Cannula and Optiflow™ Breathing Circuit, and the A-Plus Medical Babi Plus™ Bubble CPAP. Sixty ventilators, anesthesia systems and other respiratory care devices have now been validated for use with Ikaria's INOMAX DS and DSIR drug-delivery systems. This represents almost all FDA-cleared ventilation strategies used in neonatal intensive care units (NICUs) throughout the United States.

The INOMAX DS and INOMAX DSIR are proprietary drug-delivery systems that deliver INOMAX® (nitric oxide) for inhalation, the only drug approved by the FDA to treat hypoxic respiratory failure (HRF) associated with pulmonary hypertension in term and near-term infants greater than 34 weeks gestational age. HRF is a serious condition in which blood vessels in the lungs constrict, making it difficult to oxygenate blood. INOMAX selectively relaxes pulmonary blood vessels, improves oxygenation and treats HRF in this fragile newborn population.

These FDA clearances represent Ikaria's ongoing commitment to meet the needs of its customers by offering features that assist them in patient care, data reporting, and billing and reimbursement, and to provide clinicians with the flexibility to safely deliver INOMAX to critically ill patients using almost any FDA-cleared ventilation strategy.

The INOMAX DS and INOMAX DS_{IR} drug-delivery systems are part of a comprehensive offering that, in addition to the use of Ikaria's proprietary, FDA-cleared drug-delivery systems, includes INOMAX (nitric oxide) for inhalation, distribution, emergency delivery, technical and clinical assistance, quality maintenance, on-site hospital training, 24/7/365 customer service, and all related disposable items.

A complete list of ventilators, anesthesia systems and other respiratory care devices with which INOMAX drug-delivery systems are validated, as well as additional information about INOMAX, can be found at www.inomax.com.

About INOMAX®

INOMAX® is a vasodilator, which, in conjunction with ventilator support and other appropriate agents, is indicated for the treatment of term and near-term (>34 weeks gestation) neonates with hypoxic respiratory failure associated with clinical or echocardiographic evidence of pulmonary hypertension, where it improves oxygenation and reduces the need for extracorporeal membrane oxygenation.

INOMAX should not be used in the treatment of neonates known to be dependent on right-to-left shunting of blood. Abrupt discontinuation of INOMAX may lead to a worsening condition. Methemoglobinemia is a dose-dependent side effect of inhaled nitric oxide therapy. Nitrogen dioxide (NO_2) forms rapidly in gas mixtures containing nitric oxide and oxygen, and therefore may cause airway inflammation and damage. Methemoglobin, NO_2, and FiO_2 should be monitored during nitric oxide administration.

About Ikaria, Inc.

Ikaria's lead product is INOMAX® (nitric oxide) for inhalation, the only FDA-approved drug for the treatment of hypoxic respiratory failure associated with pulmonary hypertension in term and near-term infants. It is offered through an all-inclusive offering of drug product, drug-delivery system, on-site training and 24/7/365 technical assistance and support. The INOMAX therapy package also is marketed in Puerto Rico, Canada, Australia, Mexico and Japan. The company is investigating additional indications for INOMAX in bronchopulmonary dysplasia, and for inhaled nitric oxide with the INOpulse® DS drug-delivery system as a drug-device combination product in pulmonary arterial hypertension (PAH) and pulmonary hypertension secondary to chronic obstructive pulmonary disease (COPD). Ikaria's late-stage pipeline is also comprised of terlipressin, a potential treatment for Hepatorenal Syndrome Type 1 that is approved in Australia as LUCASSIN®, as well as Bioabsorbable Cardiac Matrix (BCM), a potential treatment for preventing cardiac remodeling and subsequent congestive heart failure following acute myocardial infarction. Ikaria is headquartered in Hampton, NJ, with research facilities in North Brunswick, NJ and Madison, WI and manufacturing facilities in Port Allen, LA and Madison, WI. For more information on Ikaria and its products go to www.ikaria.com.

Nurses Working Longer Shifts Are More Likely to Experience Burnout

Newswise — Extended work shifts of twelve hours or longer are common and popular among hospital staff nurses, but a new study reports that nurses working longer shifts were more likely to experience burnout, job dissatisfaction, and patients were more dissatisfied with their care.

In the first study to examine the relationship between nurse shift length and patients' assessment of care, researchers from the University of Pennsylvania School of Nursing report that nurses working shifts of ten hours or longer were up to two-and-a-half times more likely than nurses working shorter shifts to experience burnout and job dissatisfaction. Furthermore, seven out of ten patient outcomes were significantly and adversely affected by the longest shifts.

"Traditional eight-hour shifts for hospital nurses are becoming a thing of the past. Bedside nurses increasingly work twelve-hour shifts. This schedule gives nurses a three-day work week, potentially providing better work-life balance and flexibility," said Amy Witkoski Stimpfel, PhD, RN, a post-doctoral fellow at the Center for Health Outcomes and Policy Research at Penn Nursing. "When long shifts are combined with overtime, shifts that rotate between day and night duty, and consecutive shifts, nurses are at risk for fatigue and burnout, which may compromise patient care."

This study took place in California, New Jersey, Pennsylvania and Florida, which represents approximately 25% of the United States population and 20% of annual US hospitalizations. Nearly 23,000 registered nurses took part in the study over a three-year period.

Sixty-five percent of nurses worked shifts of 12-13 hours, the percentages of nurses reporting burnout and intention to leave their job increased incrementally as shift length increased, wrote Dr. Witkoski Stimpfel and Penn Nursing co-authors Linda Aiken, PhD, RN, FAAN and Douglas Sloane, PhD, in the November issue of the prestigious policy journal *Health Affairs.*

In hospitals which had higher proportions of nurses working longer shifts, higher percentages of patients reported that nurses sometimes or never communicated well, pain was sometimes or never well controlled, and they sometimes or never received help as soon as they wanted.

Dr. Witkoski Stimpfel and co-authors recommend restricting the number of consecutive hours worked, that state boards of nursing consider whether restrictions on nurse shift length and voluntary overtime are advisable, and nurse management should monitor nurses' hours worked, including second jobs.

"Nursing leadership should also encourage a workplace culture that respects nurses' days off and vacation time, promotes nurse's prompt departure at the end of a scheduled shift, and allows nurses to refuse to work overtime without retribution," noted Dr. Witkoski Stimpfel. "These types of policies that facilitate manageable work hours can contribute to the development of a healthier nursing workforce, prepared to manage the complex care needs of patients and their families."

Less-Experienced Physicians More Costly Than More Experienced Physicians

This study is the first to examine physician characteristics and medical costs. Physicians with the least experience spend significantly more money treating patients than physicians who have the most experience, according to a new RAND Corporation study.

The findings, published in the November edition of the journal *Health Affairs*, are from the first study to examine the link between physician characteristics and medical costs.

Researchers say the findings could have significant implications for less-experienced physicians, who might be excluded from contracting networks or face lower payments as both private insurers and government programs look to reward health care providers who deliver quality care at a lower cost.

"These findings are provocative, but they warrant further examination and need to be affirmed by additional studies," said lead author Dr. Ateev Mehrotra, an associate professor at the University of Pittsburgh School of Medicine and a researcher at RAND, a nonprofit research organization. "However, it is possible that one driver of health care costs is that newly trained physicians practice a more-costly style of medicine."

Commercial health plans and Medicare are using cost profiles to identify which physicians account for more health care spending than others, while devising strategies to reward those who provide quality care at a lower cost.

To identify which physician types might be costlier than others, researchers used commercial health plan claims for more than 1 million Massachusetts residents from 2004 and 2005 to construct cost profiles

for more than 12,000 physicians in the state. Costs were evaluated across 600 types of "episodes of care" that included a patient's illness and the severity of their disease, including whether a procedure was performed.

Physicians who had less than 10 years of experience had 13.2 % higher overall costs than physicians with 40 or more years of experience. Physicians with 10 to 19 years of experience had cost profiles that were 10% higher, those with 20 to 29 years of experience were 6.5% higher and those with 30 to 39 years of experience were 2.5% higher.

No association was found between costs and other characteristics such as having had a malpractice claim or disciplinary action, whether a physician was board certified or the size of the medical practice where a physician worked. The study did not attempt to judge the quality of care provided.

Researchers say the cost difference noted by the study does not suggest that less-experienced physicians provide better medical care. Previous research has found only a weak relationship between quality and spending.

Because the use of cost profiles is relatively new and such tools are still being refined, researchers are cautious about the findings.

"Our findings cannot be considered final, but they do underscore the need to better understand physician practice patterns and what influences that behavior," Mehrotra said.

There are a number of factors that may explain the findings, researchers say. Recently trained physicians may be more familiar with and more likely to use new, expensive treatment modalities than older physicians. In addition, it is possible that newer physicians' lack of experience and uncertainty translates into more-aggressive medical care. Less-experienced physicians also may attract patients with problems that are harder to address and the current cost profiling methods may not adequately account for these differences.

As newer physicians gain more experience and have longer relationships with their patients, their practice patterns may change and become less costly. However, it also is possible that the cost differences remain throughout the careers of the newly trained physicians.

Researchers say the study's findings highlight the need for postgraduate training programs and specialty medical boards to educate physicians about their responsibility to be good stewards of health care resources.

Support for the study was provided by the Commonwealth Fund and the US Department of Labor. Other authors of the study are: Rachel O. Reid of the University of Pittsburgh School of Medicine; John L. Adams and Elizabeth A. McGlynn of the Kaiser Pemanente Center for Effectiveness and Safety Research; Dr. Mark W. Friedberg of RAND and the Harvard Medical School and Peter S. Hussey of RAND.

RAND Health, a division of the RAND Corporation, is the nation's largest independent health policy research program, with a broad research portfolio that focuses on health care costs, quality and public health preparedness, among other topics.

Off-Label Medications Prescribed to Nearly All Pediatric intensive Care Patients

NEW ORLEANS – "Off label" drugs are medications that have not been tested for safety or efficacy for a specific patient age or condition. New research presented Oct. 21st at the American Academy of Pediatrics (AAP) National Conference and Exhibition in New Orleans found that off-label treatments were ordered for 96% of all pediatric patients, and 100% of patients ages 13-17, in the intensive care unit of an urban children's hospital.

In "Off-Label Drug Use in the Pediatric Intensive Care Unit," researchers collected data on all patients admitted to the 32-bed pediatric intensive care unit (PICU) at Primary Children's Medical Center (PCMC) in Salt Lake City from October 2002 to February 2003, including age, diagnosis, medications ordered and indication for each medication ordered. Each drug was assessed for whether it was used in an on-label or off-label manner.

Off-label use was declared when a drug was prescribed for a patient whose age was not listed on the package label, no pharmacokinetic (PK) data was listed in the package insert, and/or if the drug was used for a non-FDA approved indication.

A total of 335 drugs were prescribed in 492 pediatric patients from birth to age 17. Ninety-six percent of patients received at least one off-label drug. Off-label prescribing occurs in almost every patient in the PICU.

"Treatment with off-label medications is the rule rather than the exception in the PICU," said study author Susan Sorenson, a doctor of pharmacy.

"Numerous problems emanate from the lack of drug data in children, including uncertainty about whether a drug is effective in children for a particular disease, questions about the side effect profile, and lack of dosing information," said Dr. Sorenson.

"It is very difficult when you stand at the bedside and want to treat a sick child with a drug and you don't know if the dose or drug you have chosen or recommended will harm the child or help the child. Everyone does the best they can to find suggested doses and do the right thing; however, it is better medicine to dose or recommend doses based on evidence."

"This study is attempting to determine the drugs that are used most frequently in our sickest patient population that do not carry dosing information, with the intent that studies of dosing, safety, and efficacy will be carried out on those drugs," said Dr. Sorenson. "More studies need to be conducted so that prescribing in our youngest and sickest patients can be done based on evidence."

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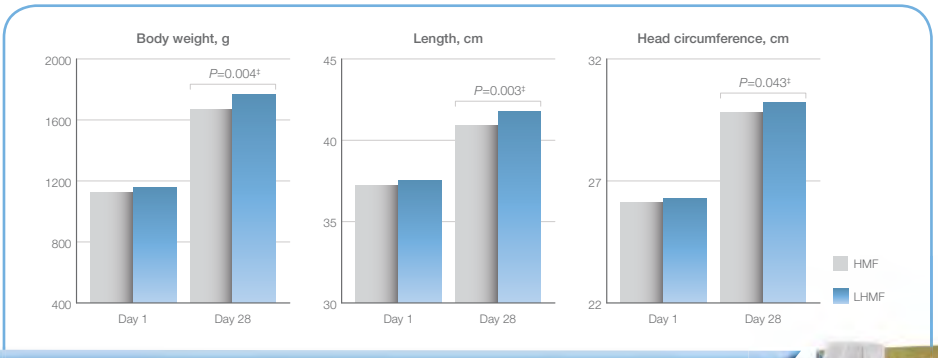
Published in *Pediatrics*

New study shows Enfamil HMF Acidified Liquid supports higher growth than Enfamil powdered fortifiers and is well tolerated

Significantly higher achieved weight, length and head circumference vs. powder Enfamil HMF[3]



- No differences in incidence of confirmed sepsis, NEC or serious adverse events[3]
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CDC = Centers for Disease Control and Prevention
ESPGHAN = European Society for Paediatric Gastroenterology, Hepatology and Nutrition
LHMF = liquid human milk fortifier
NEC = necrotizing enterocolitis
NICU = neonatal intensive care unit

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