

# PERINATAL PERSPECTIVES



A Publication of the Champlain Maternal Newborn Regional Program

September 2014

#### www.cmnrp.ca

### BREASTFEEDING AND MEDICATIONS: MOST OFTEN COMPATIBLE!

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Breastfeeding is not only the best, but also the normal way to feed an infant. The risks of artificial milk feeding are not trivial. Risks of artificial milk feeding include, but are not limited to, an increased likelihood and severity of infectious illnesses<sup>1,2</sup>, increased mortality rate in the first year of life<sup>3</sup> and reduced cognitive development for the infant<sup>4</sup>. Non-breastfeeding mothers do not benefit from the decreased risk of breast cancer that breastfeeding confers<sup>5</sup> and are at higher risk of developing mental health disorders<sup>6</sup>.

It is our responsibility, as health care providers (nurses, physicians, midwives and lactation consultants), to support and help mothers attain and maintain lactation. Most medications ingested by the mother are safe during breastfeeding. There are many misconceptions regarding the use of medications, whether for treatment purposes or diagnostic procedures. Recommendations to pump and discard milk even temporarily, when not indicated, can have a significant effect on milk volume and lead to early weaning.

The standard recommendation of most drug monographs is to avoid the medication while breastfeeding, but this is rarely based on scientific data. We therefore must rely on other sources to determine whether mothers can safely continue to breastfeed their infant while ingesting a prescribed medication. Useful references include:

- Motherisk website: <u>http://www.motherisk.org/women/drugs.jsp</u>
- Medications and Mothers' Milk: book authored by Thomas W. Hale (Hale Publishing)<sup>7</sup>
- LactMed : free App available for Apple (iPhone/iPod Touch) and Android devices

Typically, the higher the mother's plasma level of a drug, the higher the level in the breast milk<sup>8</sup>. However, this does not mean that a drug is unsafe. Other factors, such as the amount of milk consumed by the infant, should be considered. In the first few days of life, drugs pass more easily between the breast's alveolar cells, the cells responsible for milk production. Yet, the volume of colostrum consumed is very low and therefore the infant's exposure may still be low. In the older infant, the volume of milk

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South-East Ottawa Community Services

University of Ottawa

Winchester District Memorial Hospital

#### Inside:

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is reduced, as the mother's alveolar cells enlarge with increased prolactin secretion, limiting absorption. Some substances, such as iodine, are actively pumped into the breast milk and therefore should be avoided in lactation<sup>7</sup>.

Bioavailability of a drug is also important in determining its effect on the infant<sup>9</sup>. Many medications found in breast milk are destroyed by the infant's stomach acid contents. Some medications are metabolized by the liver before reaching the infant's systemic circulation, while others simply cannot be absorbed in the gastrointestinal tract<sup>8</sup>. These drugs are typically safe, but can sometimes cause diarrhea and/or constipation in the infant, and, rarely, syndromes such as pseudomembranous colitis.

Lipid soluble drugs and most central nervous system medications typically enter milk in higher concentrations. Many of these will still be safe to use in breastfeeding, however monitoring the infant for signs of sedation is prudent. Drugs that have high maternal protein binding properties do not usually reach high milk levels, as it is the free component that transfers. Drugs with low molecular weight (<500 D) enter breast milk more easily<sup>8</sup>. Finally, medications with a short half-life are generally safer than the ones with a longer half-life, because of potential build-up in the infant's system over time.

Sick and premature infants require special consideration as they have a different capacity to absorb and excrete drugs because of immature liver metabolism and renal excretion<sup>7</sup>.

Given the known benefits of breastfeeding and risks of artificial milk feeding, suspending breastfeeding without appropriate information is unacceptable. It is imperative that health care providers remember that most medications are compatible with breastfeeding. When in doubt, consult appropriate resources so as to preserve and support breastfeeding for as long as possible.



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Views, opinions and advertisements in the Perinatal Perspectives are not necessarily endorsed by the editorial staff. Comments are welcome.



### WEBSITES



The new site, <u>pregnancy.sogc.org</u>, delivers evidence-based information developed by doctors, nurses and midwives for the Canadian public and health-care professionals. Material on the site is based on SOGC guide-lines and topics include: pre-pregnancy considerations, factors that affect

fertility, routine tests and common health questions during pregnancy, special circumstances, labour and types of childbirth, and after-pregnancy considerations. This new website is a repository of all of SOGC's existing pregnancy and childbirth resources, all in one place.



**BirthTOOLs** (<u>www.BirthTOOLS.org</u>) is the acronym for Birth Tools to Optimize Outcomes of Labor Safely. The goal of the site is to present evidence and to offer targeted resources, protocols, and success

stories for clinicians, families and administrators. The resources in the web toolkit are easily accessed and provide information on the evidence supporting physiologic birth, care that promotes physiologic birth and quality improvement practices including the FOCUS-PDCA model and a "Menu of Change".



**NICU Tools** (<u>www.nicutools.org</u>). This site provides clinicians with a range of useful calculators to help them care for newborn infants. These calculators include alveolar-arterial oxygen difference (AaDO2), body surface area, glucose delivery, low flow oxygen FIO<sub>2</sub> calculator, partial exchange transfusion calculator, and others.



**Neonatal research** (<u>www.neonatalresearch.org</u>). This blog by Canadian neonatologist Dr. Keith Barrington summarizes and comments on selected current neonatal research. Examples of topics for posts in recent months

include inhaled nitric oxide in preterms, diaphragmatic hernia management, neonatal updates, assisted reproduction and neonatology, bloody stools, etc... People who are interested can receive notification of new posts via either e-mail or Twitter.

**Before, Between & Beyond Pregnancy**The **Preconception Care Clinical Toolkit** (<u>http://beforeandbeyond.org/</u> toolkit/) was designed to help primary care providers, their colleagues and their practice groups incorporate preconception health into the routine care

of women of childbearing age. The toolkit is meant to be used as a reference or as an educational tool.

### Pr. Gruslin Placenta Research Fund

After a ten-year battle with breast cancer, our dearest colleague and friend, Dr. Andrée Gruslin, passed away on June 10, 2014.

Dr. Gruslin was a maternal fetal medicine specialist at The Ottawa Hospital who spent her entire career interested in and investigating diseases of the placenta. She was passionate about placenta health and the importance it plays in pregnancy.

One of her final contributions to this important work was to set up a fund at the Ottawa Hospital Foundation. She hoped that upon her passing, her peers would donate to this fund in her memory and support the research so dear to her heart.

For more information about the Dr. Gruslin Placenta Research Fund, please contact Andrea Peponoulas, Development Officer, at 613-798-5555 ext. 14677, or email <u>apeponoulas@ottawahospital.on.ca</u>.





The Ottawa | La Fondation Hospital de l'Hôpital Foundation d'Ottawa

### RESOURCES



#### Guidelines for Identification and Management of Substance Use and Substance Use Disorders in Pregnancy

World Health Organization, 2014

These guidelines contain recommendations on the identification and management of substance use and substance use disorders for health care services which assist women who are pregnant or have recently had a child, and who use alcohol or drugs or who have a substance use disorder. They have been developed in response to requests from organiza-

tions, institutions and individuals for technical guidance on the identification and management of alcohol and other substance use and substance use disorders in pregnant women, with the target of healthy outcomes for both pregnant women and their fetus or infant. A PDF version of these guidelines can be obtained at http://www.who.int/substance\_abuse/publications/pregnancy\_guidelines/en/



#### Welcome to Parenting for Young Parents

Phoenix Centre for Children & Families, 2014

This online resource aims to provide young parents with the skills, knowledge

and confidence they need to become a positive and confident parent and create happy, healthy families. The program was developed using evidence-based content and covers an array of topics from prenatal up to 12 months of age. Topics include: prenatal and postnatal care, labour and birth, nutrition, relationships, attachment, growth and child development to help parents be the best parent possible. Young parents have access to experts and an online parent community. To celebrate the launch of this program, the Phoenix Centre for Children & Families will offer five free access codes to agencies or government departments. For more information visit: <a href="http://yp.welcometoparenting.com">http://yp.welcometoparenting.com</a> or email <a href="http://welcometoparenting.com">contact@welcometoparenting.com</a>.



#### **Evidence-Based Practice: Pearls of Midwifery**

American College of Nurse-Midwives, 2014

This free PowerPoint presentation can assist midwives and their supporters to explain the science and art of the midwifery model of maternity care. It is

designed to showcase evidence-based midwifery practice to hospital administrators, physicians, residents, students and consumers. Evidence-Based Practice: Pearls of Midwifery emphasizes the proven benefits of normal, physiologic labour and childbirth for mothers and their newborns. The presentation can be downloaded at <a href="http://www.midwife.org/pearls">http://www.midwife.org/pearls</a>.



#### Use of Social Media in Prenatal and Early Childhood Services Best Start Resource Centre, 2014

This report for service providers used literature searches and key informant interviews to identify and discuss the current best practices for social media use in prenatal and early childhood services. It highlights considerations for organizations wishing to implement social media use in their reproductive health and early childhood services. A PDF version of this report can be obtained at <u>http://www.beststart.org/resources/howto/pdf/</u>



## The Story of Baby Rabbit: A Resource to Help You Talk to Young Children About Miscarriage or Stillbirth

Graeme Smith, M. D., Ph. D., Sian Phillips, Ph. D. and Jerri Oehler, Ph. D., 2014 New book published to help families talk to young children about miscarriage and stillbirth. This book is available as an e-book free of charge from the Lulu online book shop (www.lulu.com). Soft cover print edition is also available for a small fee for printing and shipping.

### **INTERESTING ARTICLES**

### Chaillet, N., Belaid, L., Crochetiere, C., Roy, L., Gagne, G. P., Moutquin, J. M., ... Bonapace, J. (2014). Nonpharmacologic approaches for pain management during labor compared with usual care: A meta-analysis. *Birth*, 41(2), 122-137. doi: 10.1111/birt.12103

This meta-analysis assessed the effects of nonpharmacologic approaches to pain relief during labor, according to their endogenous mechanism of action, on obstetric interventions, maternal, and neonatal outcomes. CONCLUSION: "Nonpharmacologic approaches to relieve pain during labor, when used as a part of hospital pain relief strategies, provide significant benefits to women and their infants without causing additional harm."

# St. Fleur, R., & McKeever, J. (2014). The role of the nurse-physician leadership dyad in implementing the Baby-Friendly Hospital Initiative. *Nursing for Women's Health*, 18(3), 231-235. doi: 10.1111/1751-486X.12124

*Abstract:* The concept of the nurse-physician leadership dyad incorporates the expertise of both nurses and physicians as leaders of change within health system environments. The leadership dyad model has been used traditionally in health care administrative settings to manage utilization of resources more effectively. Because Baby-Friendly designation requires major cultural shifts in long-standing maternity care practices, an interdisciplinary approach to implementation is necessary.

# Kotaska, A., & Campbell, K. (2014). Two-step delivery may avoid shoulder dystocia: Head-to-delivery interval is less important than we think. *Journal of Obstetrics and Gynaecology Canada*, 36(8), 716-720.

Abstract: A belief that prolonged head-to-body delivery interval endangers the newborn underpins the common obstetrical practice of delivering the baby's trunk immediately after the head is born. Without intervention, however, birth typically occurs in two steps: once the fetal head is delivered there is usually a pause, and the rest of the infant is born with the next contraction. Allowing a two-step delivery does not increase the risk of fetal harm, and may lower the incidence of shoulder dystocia. A two-step approach to delivery should be considered physiologically normal. This has implications for the definition of shoulder dystocia.

### Nutter, E., Meyer, S., Shaw-Battista, J., & Marowitz, A. (2014). Waterbirth: An integrative analysis of peer-reviewed literature. *Journal of Midwifery & Women's Health*, 59(3), 286-319. doi: 10.1111/jmwh.12194

The majority of waterbirth research to date is observational and descriptive; thus, reported outcomes do not demonstrate causal associations. However, existing evidence is reassuring. Case-controlled studies have included thousands of women who gave birth underwater without an apparent increase in maternal or neonatal morbidity or mortality. Potential risks associated with waterbirth for women and newborns appear minimal, and outcomes are comparable to those expected in any healthy childbearing population.

## Discenza, D. (2014). Why NICU nurses mean so much to parents. *Neonatal* Network, 33(3), 166-167.

Parents of premature infants are grateful for their child's NICU nurses. Take a step onto the parent's side and see the top ten reasons parents are grateful for the nurses. You might find some surprises.

# 

**LactMed**, part of the National Library of Medicine's (NLM) Toxicology data Network (TOXNET®), is a database of drugs and dietary supplements that may affect breastfeeding. It includes information on the levels of such substances in breast milk and infant blood, and possible adverse effects in the nursing infant. Suggested therapeutic alternatives to those drugs are provided, where appropriate. All data are derived from the scientific literature and fully refer-

enced. Summaries of the reported information are provided and include links to other NLM databases. Supplemental links to breastfeeding resources from credible organizations are also provided. This free App is available for Apple and Android devices.

**CHECK OUT THESE APPS!** 



**Vaccines on the Go: What You Should Know** is a free app from The Vaccine Education Center at The Children's Hospital of Philadelphia (<u>http://www.chop.edu/</u> <u>service/parents-possessing-accessing-communicating-knowledge-about-vaccines/vaccine-</u> <u>mobile-app.html</u>). This app was developed for parents but is also a useful professional resource. It provides information about: vaccines and the diseases they prevent, along

with potential side effects; vaccine safety topics, including concerns about autism and vaccine safety monitoring systems; types of vaccines and how they're made; recommended immunization schedules for children, teens, and adults. Included are links to videos and games about vaccines. This app is available for both Apple and android devices.



**Jumelle: The best baby tracker App** is geared for parents with multiples, babies close together or child care centres. It has multiple features for tracking up to 10 children: what they did (breastfeeding, diapers, sleeping), when and for how long. It is loaded with hints, tips, suggestions and solutions! This App is available for Apple devices (iPhone/iPad).

### TEST YOUR KNOWLEDGE!

- I. When women give birth sitting upright, which of the following indicators show lower values in cord blood?
  - a) pH;
  - b) PCO<sub>2;</sub>
  - c) PO<sub>2;</sub>
  - d) Base excess.
- 2. A full-term male infant is born by vaginal delivery with vacuum extraction. His Apgar score is 7 at 1 minute and 8 at 5 minutes. He is pink and active. The nurse notices that he has a fluctuant swelling over the back of the head. Bruising around the ears is also noted. The most likely cause is:

- a) Skull fracture;
- b) Cephalohematoma;
- c) Subdural hematoma;
- d) Subgaleal hemorrhage.
- 3. What is the most accurate and effective strategy for assessing neonates for perinatal exposure to drugs?
  - a) Neonatal meconium analysis;
  - b) Use of the Neonatal Abstinence Scoring System;
  - c) Maternal history and self-report;
  - d) Neonatal urine toxicologic screening.

Check out our website for the answers! www.cmnrp.ca under Resources/Publications/Newsletter

### Conférence périnatale francophone 2014

### French Perinatal Conference 2014

### « Accoucher de manière sûre, aisée et satisfaisante grâce à la méthode Bonapace »

### Le 14 novembre 2014

à l'Hôpital Montfort d'Ottawa

Le CNFS – volet Université d'Ottawa assurera la diffusion de cette conférence par vidéoconférence à travers le Canada aux sites à distance qui en exprimeront un intérêt.

Cet événement s'adresse à tous les professionnels de la santé œuvrant en périnatalité.

### L'inscription est maintenant ouverte!

#### promethee.dualcode.com

- Créer un compte
- Cliquer sur « Formation clinique / Formation en salle / 4<sup>e</sup> conférence périnatale francophone 2014 » pour s'inscrire

Nous vous encourageons à promouvoir cet événement francophone auprès de vos collègues.

Pour de plus amples renseignements, visiter la page Web « Conférences » du CMNRP (http://www.cmnrp.ca/fr/cmnrp/Confrences\_p4074.html) ou communiquer avec France Morin par téléphone au 613 737-2660, poste 2133 ou par courriel à <u>fmorin@cmnrp.ca</u>



This conference will be offered in French on site at l'Hôpital Montfort and will also be videoconferenced to various sites across Canada.

### **Registration is now open!**

promethee.dualcode.com

- Create an account
- Click on « Formation clinique / Formation en salle / 4<sup>e</sup> conférence périnatale francophone 2014 » to register

Let your colleagues know about this event.

For more information, visit the CMNRP conference webpage (http://www.cmnrp.ca/en/cmnrp/Conferences\_p4074.html) or contact France Morin at 613 737-2660 x 2133 or email fmorin@cmnrp.ca

## SUSPENDING DISDELIEF Enhancing Simulation Based Learning in your centre



The Champlain Maternal Newborn Regional Program (CMNRP), in association with Queen's University Annual Memorial Program, invite you to participate in an interactive workshop on enhancing interprofessional simulation-based learning in your centre.



Saturday, October 25, 2014 from 08:00-12:00 Queen's University, School of Medicine **15 Arch Street** Kingston, Ontario K7L 3N6



Register online at: http://www.cmnrp.ca/en/cmnrp/Workshops\_p550.html

**Registration deadline: October 3, 2014** 

### **Perinatal Nursing Graduate Certificate Program**

CMNRP is pleased to announce that Algonquin College has received approval from the Ministry of Training, Colleges and Universities for the Registered Nurse -Perinatal Nursing Graduate Certificate Program.

This eight-course program builds on formal nursing education preparing Registered Nurses to practice within various areas of perinatal care. This program is intended for current Registered Nurses in good standing with the College of Nurses of Ontario who are either practicing in the area or are interested in perinatal specialization. It is anticipated that the first course, Foundations of Perinatal Nursing, will be offered in January 2015. CMNRP is thrilled to collaborate with Algonquin College in the development and delivery of these courses.

For more information, please contact Nancy Lada, Program Coordinator, at 613-727-4723 ext. 2466, or email ladan@algonquincollege.com

ALGONQUIN

### **NEW Workshop!** Substance use in the perinatal period

This one-day workshop, intended for interprofessional health care providers who care for childbearing families, provides a solid foundation of theoretical and clinical knowledge to facilitate effective care of mothers who have substance use disorders in the perinatal period. It also addresses the potential effects of substance use on the newborn and evidence-based care recommendations.

For more information, please consult the workshop webpage on the CMNRP website (http://www.cmnrp.ca/en/cmnrp/ Workshops p550.html) or contact Christina Cantin at 613-737-2260 ext. 3246 or email ccantin@cmnrp.ca.





www.cmnrp.ca



#### Collaboration between CMNRP and the Southwestern Ontario Maternal, Newborn, Child and Youth Network

**Your feedback is appreciated:** Please complete a short survey (5 questions) on The Learning Café webpage of the CMNRP website (<u>http://www.cmnrp.ca/en/cmnrp/The\_Learning\_Caf\_p553.html</u>)

Save the Dates - Fall's Sessions:

September 24, October 29, November 26 and December 17, 2014 \*Please note: All sessions will be offered from <u>12:00 – 13:00</u>.

3 options to participate: In person (by videoconference), live (by webcast) or archived sessions



Have topics to suggest or initiatives to share? Please contact Christina Cantin at ccantin@cmnrp.ca



### Compassionate Contraceptive Assistance Program (CCAP)

The SOGC is pleased to announce that the Compassionate Contraceptive Assistance Program (CCAP) has been re-launched! The program provides contraception to women who could not otherwise afford it. Selected contraceptives can be obtained at no cost for patients whose financial situation becomes a barrier to obtaining contraceptives.

#### Have questions?

Check out the FAQs section on their website (<u>compassion.sogc.org</u>) or contact them at <u>compassion@sogc.com</u> or 1-800-562-2416.



### CONTACT US

### Champlain Maternal Newborn Regional Program (CMNRP)

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### Webcasts of key plenary sessions from the SOGC's 70th Annual Clinical and Scientific Conference

SOGC has four FREE sessions that you can watch online.

To view these sessions, please go to <u>http://</u> sogc.org/events/annualclinical-and-scientificconference-acsc-2014/ plenary-webcasts/





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### **RESEARCH IN THE REGION**

Check out the CMNRP research webpage (<u>http://www.cmnrp.ca/site/cmnrp/Research\_p4027.html</u>) to learn more about perinatal research in the region.

Here are some of the latest postings to the webpage:

### **Regional Research Projects**

- Étude sur l'intimité et la sexualité périnatale des couples parentaux francophones en milieu minoritaire de l'Ontario Contact : Catherine de Pierrepont, <u>cdepi090@uottawa.ca</u>
- Be sweet to babies: Pilot evaluation of a brief parent targeted video to improve pain management practices
  Contact: Denise Harrison, <u>dharrison@cheo.on.ca</u>
- Folic acid clinical trial (FACT) Effect of folic acid supplementation in pregnancy on preeclampsia
  Contact: Michelle Roddy, roddym@kgh.kari.net
- Health Improvement after Pregnancy (HIP)- Pilot study looking at postpartum exercise and nutrition
  Contact: Jessica Pudwell, info@hipapp.ca
- PEGASUS: PErsonalized Genomics for prenatal Aneuploidy Screening USing maternal blood
  Contact: Dynika St Omer, <u>dstomer@ohri.ca</u>

### **Graduate Student Research**

• Development of the maternal-fetal relationship in women who use substances: Understanding the influence of intersecting variables on prenatal attachment and health behaviours.

Contact: Michelle Foulkes, mfoulkes@toh.on.ca

### **New Funding Opportunity**

**The \$15K Challenge Call for Proposals** – The \$15K Challenge will award \$15,000 or more to individuals in organizations working to advance the health of women and girls. Women's Xchange can help transform your ideas into research that will make an impact in the communities you serve. The next call for proposals will be in February 2015. For more information, visit the Women's Xchange website at <u>http://womensxchange.ca/15k/</u> or e-mail <u>info@womensxchange.ca</u>

### Congratulations to our regional colleagues for their recent publications!

Bassil, K. L., Yasseen, A. S., Walker, M., Sgro, M. D., Shah, P. S., Smith, G. N., Campbell, D. M., ... Maguire, J. L. (2014). The association between obstetrical interventions and late preterm birth. *American Journal of Obstetrics & Gynecology*, 210(6), 538.e1-538.e19 doi:10.1016/j.ajog.2014.02.023

Campbell, Yeo, M., Deorari, A., McMillian, D., Singhal, N., Vatsa, M., Aylward, D., Scotland, J., Kumar, P., Joshi, M., Kalyan, G. & Dol, J. (2014). Educational barriers of nurses caring for sick and at-risk infants in India. *Journal of International Nursing Review*. Advance online publication. doi: 10.1111/inr.12121.

**Daboval, T., & Shidler, S.** (2014). Ethical framework for shared decision making in the neonatal intensive care unit. Communicative ethics. *Paediatrics & Child Health, 19*(6), 302-304.

**Daboval, T., Moore, G. P., Rohde, K., Moreau, K., & Ferretti, E.** (2014). Teaching ethics in Neonatal-Perinatal Medicine: What is happening in Canada? *Paediatrics and Child Health*, 19(1), e6-e10.

**Darling, E. K., Guttmann, A., Sprague, A. E., Ramsay, T., & Walker, M.** (2014). Implementation of the Canadian Paediatric Society's hyperbilirubinemia guidelines: A survey of Ontario hospitals. *Paediatrics and Child Health, 19*(3), 133-37.

Fell, D. B., Platt, R. W., Lanes, A., Wilson, K., Kaufman, J. S., Basso, O., & Buckeridge, D. (2014). Fetal death and preterm birth associated with maternal influenza vaccination: Systematic review. *BJOG*. Advance online publication. doi: 10.1111/1471-0528.12977.

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Moore, G. P., Lines, M. A., Geraghty, M. T., de Nanassy, J., & Kovesi, T. (2014). Novel mutation in ABCA3 resulting in fatal congenital surfactant deficiency in two siblings. *American Journal of Respiratory and Critical Care Medicine*, 189(12), 1538-1543. doi: 10.1164/rccm.201402-0342OC.

Moore, G. P., & Navabi, B. (2014). Making a choice: The initial fraction of inspired oxygen for resuscitation at birth of a premature infant less than 32 weeks gestational age. Research and Reports in Neonatology, 4, 1-7.

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Peterson, W. E., Sprague, A. E., Reszel, J., Walker, M., Fell, D., Perkins, S. L., Dunn, S., & Johnson, M. (2014). Women's perspectives of the fetal fibronectin testing process: A qualitative descriptive study. *BMC Pregnancy and Childbirth*, 4(14), 1-9. doi: 10.1186/1471-2393-14-190

Peticca, P., Shah, B. R., Shea, A., Clark, H. D., Malcolm, J. C., Walker, M., Karovitch, A., ... Keely, E. J. (2014). Clinical predictors for diabetes screening in the first year postpartum after gestational diabetes. *Obstetric Medicine*, 7(3), 116-120. doi: 10.1177/1753495X14528487.

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Surprenant, D., Milne, S., Moreau, K., & Robert, N. (2014). Adapting to higher demands using innovative methods to treat infants presenting with torticollis and plagiocephaly. *Pediatric Physical Therapy*, 26(3), 339-345.

Wang, D., Aubertin, C., Barrowman, N., Moreau, K., Dunn, S., & Harrold, J. (2014). Examining the effects of a targeted noise reduction program in a neonatal intensive care unit. Archives of Disease in Childhood – Fetal and Neonatal Edition, 99(5), F203–F208. doi: 10.1136/archdischild-2013-304928