PANHANDLE HEALTH

A QUARTERLY PUBLICATION OF THE POTTER-RANDALL COUNTY MEDICAL SOCIETY

SUMMER 2013 | VOL 23 | NO. 3

Pediatric Care

A wide spectrum occuring at Texas Tech University Health Science Center in Amarillo

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Editor's Message

by E.F. Luckstead, M.D.

This summer issue of *Panhandle Health* presents a capsule of the wide spectrum of pediatric care occurring at Texas Tech University Health Science Center in Amarillo. Medical care extends from the prenatal period such as fetal echocardiography, through newborn infants and their mother's care guidelines, to older age children and adolescent medical needs. Specialty articles address hematology-oncology care areas and pre-participation exams to ideally identify high risk youth that may suffer dire consequences from school physical education exercise and/or sport-related exercise! The commentary article by Dr. Todd Bell on the recent "flu" season from a public health and pediatric perspective provides us with factual and public related information. Dr. Shum and his toxicology associates provide an update on adolescent youth drug use and abuse in our community for medical and public awareness. Resident case corner reminds us that maternal-infant blood incompatibility issues still occur despite our modern obstetric and newborn prevention factors.

Our profile of Dr. Marita Sheehan highlights this outstanding pediatric physician from our medical school and community.

The two pediatric sport medicine articles in this issue discuss the current conundrums involving sport-related head concussions in both the pediatric and adult sport world as well as pre-participation exams (PPE)? The article on the pre-participation exams relates current guidelines for the cardiovascular history and physical exam along with possible other test needs when certifying youth for full, partial or no active participation roles. These exams ideally should identify youth as high risk, limited or no risk from physical exercise activity and/or selected sport participation at the elementary or higher school grade levels.

Diagnosis of congenital heart problems in the fetal age infant is outlined succinctly in Dr. Alapati's fetal echocardiogram article. The expectant pharmacology effect from maternal drug use on the fetus and breast fed newborn infants are noted in Dr. Hale's timely article. Dr. Huang describes her new mother-nurse study that pairs new vulnerable mothers and their newborns with a partner nurse care support.

Dr. Regueira in his article presents the short and long term challenges of acute, chronic and eventual transition to adult care in their hematology and oncology patients. The care needs in these patients will often require both primary care physician and subspecialty physician medical support and expertise. Care and support from specialty trained nurses and non-physician care providers (pharmacists, nurse practitioners, and physician assistants) will likely play a larger role in the care of such patients at all levels.

Timely and interesting medical updates from the medical literature in a summary format are presented by Dr. Tarek Naguib. Do not hesitate to send comments good or bad to me or any other members of the editorial board regarding our journal article for the summer edition of *Panhandle Health*. Happy Reading!

Our Next Issue Of
Panhandle Health
Features:
Profiles in the Panhandle

Executive Director's Message

by Cindy Barnard

The theme of our Summer issue is "Pediatrics At Texas Tech University Health Sciences Center". The mission of the Department of Pediatrics is to provide the highest standard of medical care for pediatric patients from birth through adolescence, encompassing primary, subspecialty and tertiary care. The Department serves as an advocate for pediatric health issues affecting infants, children, and adolescents in our region and state.

The Retired Physician Group attended a luncheon at the Medical Society office April 1st. A summer event is in the planning stages. If you are interested in joining this group, please call the Society's office at 355-6854. (Below is a picture from the Retired Physicians luncheon.)

The new 2013-2014 Panhandle Area Physicians Roster will be available July 1st. Call or come by the Medical Society Office to purchase your new Directory. Every physician who is a PRCMS member will receive a complimentary Roster in the mail.

Our cover for this issue is entitled "Feet On English Soil" by Leslie David. Leslie graduated from Texas A&M and is a Registered Dietitian in Amarillo. She studied under Rita Berry, an artist at Sunset Center and entered her first competition in the Lone Star Pastel Society of Amarillo, winning First Place Landscape a few years ago. Her cover painting won Second Place Floral another year and was inspired by her daughter's photo, taken in England. Leslie paints in pastel, watercolors, and oils. She is the wife of Dr. John David, a local OBG, and a member of PRCMS.

Alliance News

by Anna Holland, President

The Potter Randall County Medical Alliance is off to a wonderful start this year. The Alliance Board is hard at work developing a schedule of events to rejuvenate the membership and reach out to both established and new members. Our goal for the year is to increase camaraderie and community involvement among our members by hosting FUN events that enable us to give back!!!

So far this year, we celebrated Doctor's Day by recognizing our physicians with a thank you ad in the Amarillo Globe Newspaper and by making a donation in their honor to the High Plains Food Bank. We had a wonderful time at our spring Cocktails and Conversation Happy Hour at Amy Irwin's home. We once again supported the High Plains food bank with the two canned goods everyone brought for admission to the happy hour. A special thank you goes out to the Irwin's for opening their beautiful home. We will be teaming up with the Society this fall for a family event, and the annual Christmas party will be in December! Stay tuned for other exciting chances to spend time with your fellow alliance members.

We are blessed to have close to 250 members in the alliance and we are actively seeking ways to get people involved with each other and the medical community. The Potter Randall County Medical Alliance has a long and rich history of giving back to the area and we are constantly seeking feedback for ideas for fundraising and events, and we welcome your input. In addition, we hope to be the welcoming committee to medical families new to the Panhandle. Please email the Alliance at potterrandallalliance@yahoo.com if you know of new physicians coming to Amarillo so we can help roll out the red carpet and welcome them to Amarillo and Canyon. Also, make sure to check us out on our facebook page at https://www.facebook.com/PotterRandallCountyMedicalAlliance. We look forward to a fun and productive year!

Rachel Anderson, Soleil Arrieta & Dr. Kat McNeil.

Amy Irwin, Anna Holland, Lorraine Wilhelm & Michele Agostini

Kensie Wolcott & Kiki Brabham

Concussion Conundrum

by Johnnie Faircloth, M.D.

Concussion is defined as a "complex pathophysiological process affecting the brain, induced by biomechanical forces (1)." Awareness of sport related concussion is spreading from athletic training rooms to court rooms as the media pay more attention to this once overlooked and still under recognized brain injury. State legislatures, including ours, pass concussion related laws while research in this field is hotter than ever before. Physicians, feeling pressured to stay current, can become overwhelmed; however, staying informed is paramount to accurate diagnosis and management of this condition (2). Physicians face the predicament of protecting their patients and themselves while managing concussions.

Neuropsychological tests in concussion management

The physician diagnoses concussion by examining the constellation of patient reported symptoms, signs on physical exam, and results of neuropsychological testing. Most physicians can easily familiarize themselves with the appropriate concussion history and physical exam, but neuropsychological deficits, which may remain after other signs and symptoms have resolved, are best evaluated by a neuropsychologist (3). Formal neuropsychological testing is not always available and is a lengthy and costly process. Promising solutions to the problem are newly developed neuropsychological computerized testing programs that efficiently measure cognitive domains, such as attention, memory, and language and don't require a neuropsychologist (3). They do, however, require training and although they are being utilized by sports medicine physicians in many professional leagues, colleges and high schools, they aren't yet sufficiently studied to be recommended as standard of care.

Computerized tests are best able to reveal cognitive deficits if the patient has previously performed a baseline test. Comparison of post concussion results to a baseline can reveal deficits in patients who have a normal physical exam and are otherwise asymptomatic. These tests will potentially prevent the premature return to play of vulnerable, concussed athletes, especially children, who are at risk of adverse events such as a second, longer lasting concussion or the deadly second impact syndrome. Second impact syndrome results in potentially fatal swelling of a brain that suffers a "second impact" while still acutely concussed. Outside of boxing, it has only been diagnosed in those under age twenty one.

While promising, these computerized tests have a downside, and research is ongoing. Although less costly than formal neuropsychological testing for the individual patient, access to the system and training of the individual physician can be cost-prohibitive for the provider who may only manage a handful of concussions in a season. Additionally, currently available tests are not recommended for children under age twelve, and obtaining a baseline test for older athletes is difficult (3). Most testing requires at least fifteen to twenty minutes on a computer with minimal distractions for accuracy. Imagine an entire high school athletic team testing in the setting of a gym or clinic and one can easily see the potential for problems. Comparison of post concussion tests to "normal" peer data is available but hasn't been sufficiently studied for proven reliability. This practice currently appears to miss some concussions and "finds" concussion in healthy subjects (3). Potential problems can also be encountered in those athletes for whom a baseline test is available. How do the advances in normal neurocognitive development of the athlete during the time between baseline testing and post concussion testing effect the validity of results? Do multiple attempts or practice influence the test results? Can the test accurately detect when athletes intentionally do poorly on the baseline test, knowing it will potentially be used to keep them from participating? These questions have not yet been sufficiently answered by research.

Other objective measures of concussion

Patients, as previously mentioned, can be asymptomatic and have a normal physical exam while still recovering from the effects of concussion. Additionally, neuropsychological testing does not always provide the answer to questions regarding the diagnosis and management of concussion. So, are there other objective methods available to the physician for the evaluation of concussion? Prior to recent advances in neuroimaging computed tomography (CT) and standard magnetic resonance imaging (MRI) were the only non-invasive methods to evaluate the injured brain. Within the first twenty four to forty eight hours of a head injury, CT is useful in evaluating patients with potentially serious signs or symptoms such as a Glasgow coma score less than 15, deteriorating mental status, or worsening of symptoms (4). Afterwards, MRI can be used to evaluate patients with focal neurological deficits or unusual symptoms. These tests will find evidence of fractures or bleeding into the brain but will be normal in concussion. Recently, research into the abilities of other neuroimaging modalities and physiologic markers of concussion to aid the physician are giving promising results but are not yet ready for use in the typical patient. Limitations in many of these studies include small sample size, non sports concussion focus, and rare evaluation of children (4).

Diffusion tensor imaging (DTI) is a type of MRI that uses the diffusion properties of water to detect microscopic changes in the axons

of the white matter of the brain (5). This technique is sensitive enough to find these diffuse axonal injuries in patients where standard MRI has failed (5). Atlases of normal DTI images are being developed in hopes of using them to compare with concussed brain images (5). DTI can detect changes in the brain of concussed athletes as well as those who have suffered multiple sub-concussive blows (5). Other studies have used DTI findings to predict specific neurocognitive deficits, to monitor post concussion symptoms, and to improve prognosis (5).

Functional MRI (fMRI) is a research method used in the investigation of neuroanatomical substrates of neuropsychiatric and cognitive disorders and has only recently been used in concussion research (6). fMRI can detect areas of increased blood flow in the brain, which is useful in showing researchers where the brain is most active at a given point in time. This modality is particularly helpful in studying memory, executive function, and other potentially abnormal tasks of the concussed brain (6). Some of the most interesting fMRI data are from studies that measure the brain's natural recovery and response to specific symptom treatment (6). Persistent brain function abnormalities such as depressed reaction speed and recall abilities may remain for a year or more following concussion (6). When certain tasks are tested with fMRI , evidence exists for potential "compensatory recruitment" of portions of the brain not usually associated with the tested cognitive function. It is not known if this recruitment is a true improvement in the brain's ability to complete the tasks or merely an epiphenomenon of the patient's increased effort (6).

In addition to DTI and fMRI, other potential imaging tools for physicians who manage concussion are susceptibility weighted imaging, magnetic resonance spectroscopy, and positron emission tomography. These modalities may potentially be used by concussion researchers and specialists in the management of the occasional patient but none are ready to be used as standards in concussion care. Other objective tools on the horizon will utilize electroencephalogram and genome-wide association studies to look into the role genetics plays in concussion. Researchers are also studying chemical biomarkers of concussion in blood and cerebrospinal fluid. These tools may someday take the educated guesswork out of the management of complicated concussion cases but not yet.

New legal predicaments

As we have seen, a true gold standard of care that fits all patients who suffer concussion is lacking, yet the media, governments, and parents are justifiably focusing more time and attention on this injury. This scrutiny raises the stakes for physicians who sometimes can't be certain about their management decisions. I've touched on some of the new data regarding short and long term effects of concussion becoming available to physicians, but this data is incomplete. At times it seems the legal system is making faster strides than the medical system. In 2011 the Texas Legislature passed House bill 2038 which requires school districts to establish concussion oversight teams. As a result parents are presenting to physicians the new UIL Concussion Management Protocol Return to Play Form. Acknowledgements found on this form include, "The school has received a written statement from the treating physician indicating

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that, in the physician's professional judgment, it is safe for the student to return to play" and the parent "Understands the risks associated with the student returning to play." It seems as if the school districts, who are being successfully sued, are attempting to transfer the liability to the parents and, ultimately, the physicians (7).

It is not possible for a parent or physician to have this level of certainty and in fact no physician can be absolutely sure about a child's readiness to return to play (7). Additionally, the medical community isn't even close to fully understanding the risk of multiple concussions suffered by athletes. Concussion related law suits are being filed against professional leagues, universities, school districts and physicians. Concussion treating physicians will do themselves and their patients well by understanding the latest in expert management recommendations. The best guidelines are probably found in the "Consensus statement on concussion in sport: the 4th International Conference on Concussion in Sport" held in Zurich, November 2012, which was published in March of this year (1). Although "not intended as a standard of care", a phrase likely meant to protect both the authors and the treating physicians who use the guidelines, the consensus statement is a great guide and its use will benefit both the patient and the physician.

Any athlete suspected of suffering a concussion should immediately be taken out of the game, evaluated by trained personnel, and not allowed to return to play if found to suffer a concussion or if concussion cannot be ruled out. Upon evaluation in the emergency department or during a follow up in the clinic, the physician should obtain a complete history and exam with special attention to worsening symptoms, neurologic, and balance problems. The SCAT 3 and child SCAT3, available free of charge, can assist in covering all important points. The symptomatic patient should refrain from all cognitive and physical activities that exacerbate their symptoms. They should be excused from school and work activities until reasonable accommodations are made available. Upon resolution of symptoms and physical exam deficits, neuropsychological testing can be performed. Patients whose symptoms last longer than 10 days should be managed with the assistance of a sports-related concussion specialist. A gradual return to play protocol may begin when all post concussion deficits are resolved (1).

As a primary care sports medicine fellow, I have been intimately involved in the management of many concussed athletes. It's never pleasurable to hold an athlete out of play as they recover from concussion but I truly enjoy the opportunity to work these athletes. The intent of this article is not to discourage physicians from treating concussion but only to raise awareness of the issues facing those who do. There are not enough concussion specialists in the fields of neurology, sports medicine, etc. to manage the growing numbers of concussed athletes. My hope is that physicians in primary care and other specialties will receive the necessary training and take on the challenge of caring for these patients.

References

1. McCrory P, et al. Consensus statement on in sport: the 4th International Conference on Concussion in Sport held in Zurich, November 2012. Br J Sports Med. 2013; 47: 250–258.
2. Zonfrillo MR, Master CL, Grady MF, Winston FK, Callahan JM, Arbogast KB. Pediatric providers' self reported knowledge, practices, and attitudes about concussion. Pediatrics. 2012; 130: 1120-1125.
3. Darby DG, Master CL, Grady MF. Computerized neurocognitive testing in the medical evaluation of sports concussion. Pediatr Ann. 2012; 41:9: 371-376.
4. Keightley ML, Chen JK, Ptito K. Examining the neural impact of pediatric concussion: a scoping review of multimodal and integrative approaches using functional and structural MRI techniques. Curr Opin Pediatr. 2012; 24:6: 709-716.
5. Shenton ME, et al. A review of magnetic resonance imaging and diffusion tensor imaging findings in mild traumatic brain injury. Brain Imaging and Behav. 2012; 6: 137–192
6. McDonald BC, Saykin AJ, McCallister TW. Functional MRI of mild traumatic brain injury (mTBI): progress and perspectives from the first decade of studies. Brain Imaging and Behav. 2012; 6: 193–207.
7. Amberg PA. Protecting kids' melons: Potential lia concussion bility and enforcement issues with youth concussion laws. Marquette Sports Law Review. 2012; 23: 1: 171-201.

Routine Management of the Healthy Newborn Infant as Recommended by the AAP

Geronimo Mendoza-Urias, M.D. ***Mubariz Naqvi, M.D.***

"There are many places in the world where parents dare not select their babies' names in advance. It's not that these parents love their children less than we do, it's because they know there is a good chance their babies will die". Linda Arnold, MD, FAAP.

This review provides a brief synopsis of the most up-to-date recommendations in the routine care of the healthy term neonate. These interventions are simple, effective, readily available, affordable, and have shown significant decrease in newborn morbidity and mortality; therefore health care providers involved in the care of babies should be familiar with them, and at the same time they should advocate for generalized implementation of these life-saving interventions. More detailed information on the standard of care of the newborn can be obtained from several sources as recommended by the American Academy of Pediatrics (AAP).

Thanks to the increasing availability and quality of obstetric and neonatal care, public health interventions, and socioeconomic progress, the neonatal mortality rates (NMR) have declined over time. Despite this improvement the US NMR, 4.19 deaths per 1,000 births, is still relatively high compared to other developed nations; this sole fact should concern society at large, policy makers and most importantly health care institutions and providers involved in the care of pregnant women and neonates. Simple preventive interventions, such as maintaining normal temperature of the newborn, have shown significant decrease in newborn morbidity and mortality, thus demonstrating the importance and the necessity for a generalized implementation of these life-saving interventions. In response to the need for some operating rules, the American Academy of Pediatrics (AAP) and the American College of Obstetricians and Gynecologists (ACOG) joined efforts, and since 1983 they have been publishing evidence-based guidelines for perinatal care. This review provides a brief but complete synopsis of the most up-to-date recommendations which have proven useful in the routine care of the healthy newborn.

Health care providers should anticipate the needs of newborns before delivery, in order to provide them with

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Retired Physicians Lunch – April 1, 2013

the most appropriate care according to their specific needs. The AAP recommends a regionalized system that consists of the following levels of care:

1. Level I or Newborn Nursery provides care to healthy newborns of ≥ 35 weeks of gestation.
2. Level II or Special Care Nursery should provide care for ≥ 32 week infants with a weight ≥ 1500 gram.
3. Level III or NICU offers comprehensive care to all critically ill infants of all the gestational ages and weights.
4. Level IV or Regional NICU provides care to neonates with special needs, especially infants with congenital malformations or complex medical conditions that cannot be treated in a level III NICU.

Before the delivery, if any significant risk factor or anticipated complications are foreseen by the OB staff, they should be communicated to the nursery staff; effective communication between both teams is prudent for appropriate and timely care of the newborn. Soon after delivery, all newborns must be rapidly assessed and the Neonatal Resuscitation Program (NRP) algorithm should be followed; a term baby, with clear amniotic fluid, crying and with good tone does not require resuscitation, indicating that routine care can be initiated. The baby then is placed under a radiant source of heat, the head is placed in the "sniffing position", the airway is cleared with bulb suction, and the baby is dried and stimulated at the same time. Immediate umbilical cord clamping is performed within 30-60 seconds after delivery, followed by the assignment of the Apgar Score at 1 and 5 minutes. If stable, the patient is placed on the mother's chest for skin to skin contact, and immediate breast feeding can be implemented (usually recommended within the first hour of life).

No later than 2 hours after delivery the baby should be evaluated by the nursery personnel. Once in the nursery the neonate should be observed for at least 2 hours and vital signs obtained and recorded every 30 minutes. A postnatal gestational age assessment is performed within the first 12 hours of life by using the New Ballard Score. The infant's weight, length and

head circumference are obtained and plotted on the Lubchenco curves. Using the baby's weight, the newborn is then classified as small, appropriate, or large for gestational age for risk stratification purposes. The oxygen saturation of the infant should be ≥ 95% pre and postductaly after 15 minutes and 1 hour respectively. Shortly after birth erythromycin (0.5%) or tetracycline (1%) eye ointment is used for prophylaxis against gonococcal neonatal conjunctivitis. (Note: this would not prevent chlamydial eye infection). In order to prevent early and late hemorrhagic disease of the newborn, a single dose of 0.5-1 mg of intramuscular vitamin K1 is administered. Oral vitamin K is not recommended as it doesn't prevent the late presentation of the disease. Before discharge from the nursery all newborns should receive the first dose of the Hepatitis B vaccine (irrespective of the Hep B status of the mother) if the infant is stable and with a birth weight ≥ 2 kg. Currently dry care of the umbilical cord is recommended, and no antiseptic solutions or dressings should be used.

If the infant is healthy without any significant risk factors, the newborn should be evaluated within the first 24 hours by a health care provider, and a very thorough head to toe physical examination, including documentation of the red reflex, is recommended. The purpose of a detailed examination is to identify any clinical abnormalities, birth defects, or syndromes.

Newborn screening is mandated by Texas law. It tests for 28 diseases, and the samples should be collected before discharge (that is, between 24 to 48 hours of life) and between the first and the second week of age. Similarly, a hearing screen using otoacustic emissions is usually performed before discharge. In case of early discharge before the screening can be performed in the nursery, the screening should be performed without any exceptions no later than one month of age, and a complete audiological assessment should be performed before three months of age for those who did not pass the initial screening. If this comprehensive evaluation confirms hearing loss, infants should receive appropriate intervention no later than at 6 months of age.

Jaundice is a very common condition of the newborn, and newborn nurseries should have policies in order to identify those who may develop severe hyperbilirubinemia; there is no universal protocol, but at least a predischarge bilirubin level should be performed, by either a transcutaneous bilirubinometer or a total serum bilirubin performed with the metabolic screening. The result should be plotted on an hour-specific nomogram to assess the risk for the development of bilirubin encephalopathy, so that appropriate therapy could be initiated to prevent kernicterus.

Universal screening of developmental dysplasia of the hip (DDH) by physical examination and identification of risk factors should be performed. A positive Ortolani or Barlow test, asymmetric skin folds, and shortening of the thigh are suggestive

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of DDH, and if present the patient should be referred to an orthopedist and/or hip US should be performed (best between 4-6 weeks of age).

Vaginal and rectal cultures for Group B Streptococcus (GBS) should be collected in all women between 35 to 37 weeks of gestation; intrapartum antibiotic prophylaxis must be given to those who test positive. Women with unknown GBS status with either prolonged rupture of membranes (≥ 18 hours), intrapartum fever (100.4 F), and/or delivery at < 37 weeks of gestation, women with GBS bacteruria during the current pregnancy and those who have a history of a previous newborn with GBS infection should also be treated. For appropriate treatment, the prophylaxis should be administered at least four hours before delivery; the preferred antibiotic is penicillin G. In case of maternal allergy to penicillins, clindamycin and erythromycin are used; when cultures show resistance to them or the susceptibility is unknown, vancomycin should be used. If neonatal sepsis is suspected a full sepsis work up (CBC with manual differential, blood cultures, C reactive protein, Lumbar puncture and if respiratory symptoms are present a chest x-ray) should be performed, followed by empiric initiation of ampicillin and gentamicin. If maternal chorioamnionitis is present, the newborn is also started on the previously mentioned antibiotic regimen after a limited sepsis work up (blood culture, CBC and CRP) is done. Babies from GBS negative mothers or from mothers who received appropriate prophylaxis should be observed for at least 24 hours, while neonates born from GBS-colonized women who did not receive prophylaxis should be observed for at least 36 to 48 hours in the hospital. The implementation of this guideline has decreased the incidence of early-onset GBS sepsis by 80-95%.

The current guidelines recommend screening for hypoglycemia before every feeding on late preterm (34 – 36 6/7 weeks) and small for gestational age infants for 24 hours and on large for gestational age and infants of diabetic mothers for 12 hours. More importantly, glucose should be measured on any infant with signs consistent with hypoglycemia, e.g. irritability, tremors, jitteriness, exaggerated moro, high pitched cry, seizures, lethargy, floppiness, cyanosis, apnea or poor feeding. At risk newborns ought to be fed every 2 to 3 hours. The target glucose levels are ≥ 40 mg/dl in the first 4 hours of life, ≥ 45 mg/dl between 4 to 24 hours of life and ≥50 mg/dl afterwards. If borderline values are obtained with whole blood samples, then serum glucose should be obtained.

Some critical congenital heart defects can be identified by using pulse oximetry screening. This should be measured on both the right hand (pre-ductal) and right foot (post-ductal) at 24 hours of life or later, a screen would be considered positive if 1) a reading < 90% is obtained in any extremity 2) a difference of > 3% between the right hand and foot in 3 separate readings, performed at least one hour apart from each other or 3) three readings between 90 to 94, performed at least one hour apart from each other. Those with a positive screening should undergo diagnostic echocardiogram. Use of pulsatile index is being investigated to rule out left sided obstructive lesion e.g. coarctation of the aorta.

After observation for at least 24-36 hours a newborn can be discharged provided that vital signs, physical exam, and clinical course have been normal, successful feeding has been achieved, the infant has been urinating regularly and has passed at least one stool, all preventive measures have been performed, all the indicated screening tests have been completed and reviewed, parents or guardians have successfully demonstrated competence in the care of the newborn, social risk factors have been addressed, and outpatient medical care has been arranged.

One of the most important tasks for a health care provider involved in the care of newborns is the education of care givers, especially for first-time parents. Parents should be aware that newborn male circumcision is currently recommended by the AAP; however, since the benefits are not great, the final decision is left up to the parents. Parents should be discouraged from using antiseptic solutions or dressings for the umbilical cord, and instructed to avoid bathing the baby until the cord comes off, at 10 to 12 days of age. Encouragement of breast feeding should be constantly provided during the hospital stay. Teaching on breast feeding, or formula if preferred, should be provided and assessment of feeding should be done before discharge. Parents need to be instructed on how to prevent Sudden Infant Death Syndrome (by placing the baby on its back to sleep), hand washing of all people handling the baby, and the importance of having a car seat and how to use it. Finally, parents should be educated on how to use a thermometer and to seek immediate medical attention if the infant is febrile within the first 6 weeks of life.

The implementation of these simple guidelines has made a huge impact in the immediate and long term outcomes of the newborns in developed nations. Consequently, we believe that all health care providers involved in the care of newborns must be acquainted with them; in addition, we should advocate for the introduction of these simple intervention for the care of the newborn babies in developing nations.

1. Riley LE, Stark AR. Guidelines for Perinatal Care. Washington, D.C. American Academy of Pediatrics; Seventh Edition (October 29, 2012).
2. Kattwinkel J et al. Neonatal Resuscitation: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Pediatrics 2010;126:e1400-e1413.
3. Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks of Gestation. Pediatrics 2004;114:297-316.
4. Committee on Infectious Diseases and Committee on Fetus and Newborn. Recommendations for the Prevention of Perinatal Group B Streptococcal (GBS) Disease Pediatrics. 2011;128:611-616.
5. Committee on Fetus and Newborn. Postnatal Glucose Homeostasis in Late-Preterm and Term Infants. Pediatrics 2011;127:575-579.
6. Kemper AR et al. Strategies for Implementing Screening for Critical Congenital Heart Disease. Pediatrics 2011; 128:5 e1259-e1267.

Why Pre-participation Physical Exams (PPE) in Youth Sports and Physical Education?

by E.F. Luckstead, M.D.

The number of preadolescent and adolescent boys and girls active in sports and recreational physical activity continues to increase each year. Most will require some type of physical exam prior to becoming active in sports and active physical education programs. An accurate history and physical examination of selective core areas should be a part of any PPE format in a sport or any physical education program having significant physical activity or exercise challenges. (See Box 1) One must use such pre-participation exams in youth to optimally predict and allow their safe participation. Such exams are also needed in youth involved in physical education with expectant challenging physical exercise. Youth with known cardiac, respiratory and musculoskeletal limitations will need guidance in sport competition or physical education limits at their elementary, high school or recreational sport levels. Medical guidelines to enable safe participation should be the highest priority for all pre-participation exams (PPE) in all youth.[1]

The cardiac examination definitely will need a high priority because, when specific cardiac abnormalities do exist, those youth can have serious or fatal complications. An exercise challenge from either active sport participation or physical education classes with significant exercise challenges may prove fatal. Certain cardiac abnormalities are known to be higher risk for cardiac related complications. (Table one) Fortunately, most youth are healthy and can participate in most sports, physical education or recreational sport programs with little or no problem.

An accurate history and physical examination is the cornerstone of the PPE in America.[4] Any suggestion of a possible cardiac abnormality should be addressed with further cardiac evaluation such as an EKG or possibly other forms of cardiac testing. More than 95% of sudden deaths in young athletes occur from cardiac causes. Any youth presenting with severe chest pain, severe dizziness, or syncope associated with physical exertion requires further cardiac evaluation. An EKG can be done as a screening tool for high risk cardiac anomalies. Other tests such as a chest x-ray, an echocardiogram, a Holter monitor or event monitor study (for heart rate concerns) may be needed to confirm or rule out possible cardiac issues.

Most countries in Europe and Asia now include a resting EKG as part of their PPE for sport participation. American sports medicine groups use the PPE history and physical exam format based on AHA guidelines but do not mandate or recommend adding the EKG as a prescreening test. There does appear to be increased or growing support for the possible selective addition of EKG screening among many in the medical community and from parent support group organizations like Parent Watch.[2, 3]

A consensus group made up of American, European and Asian cardiologist and sport medicine physicians have recently published new data with supporting information from the ESC 2010 EKG guidelines that supplant the 2005 EKG criteria for athletic PPE EKG screening.[7, 8] Their findings noted an improved correlation reliability (selectivity) and accuracy (specificity) when adding athlete's heart EKG 2010 changes to their 2005 criteria. The updated EKG normal and abnormal changes as outlined in the new EKG 2010 ESC criteria resulted in better EKG accuracy and specificity.[5]

Several other recent studies provide more support for using the EKG either as the only PPE test or using the EKG with the PPE history and physical exam format screening process.[9] Guidelines for young athletes with known cardiac abnormalities that have either had surgery or palliation and those physically functioning normally not requiring surgery or medication support can often participate with their peer group.[6] [See Figure]

It is helpful for the PPE examining physician to know the physical and emotional demands of the individual sport or physical education program. Proper training, conditioning and guidance are all important facets for attaining a positive sport or physical activity experience in all youth.

Children with blood disorders (such as sickle cell anemia or hemophilia), diabetes mellitus, asthma, cystic fibrosis, seizure disorder, chronic cardiac and kidney diseases do need specific exercise prescription guidance to obtain the positive benefits of exercise. In addition, Special Olympics participants and those rehabilitating from major and minor illnesses may need specific pre-participation advice.

Other aspects of the PPE screening process have currently taken center

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stage with the "exploding" conundrum and concerns regarding the increasing number of sport-related concussions. Football, soccer, basketball, wrestling, roller-blade skating, skiing-snowboarding, cheerleading, gymnastics and other sports will need management guidance for either acute head injuries or possible major joint injuries requiring proper diagnosis and rehabilitation. (See article on "Concussion Conundrums" in this issue)

In summary every child, adolescent and young adult should benefit from active physical exercise when involved in physical education, recreational exercise or sport related training. After the PPE they should be certified medically for full participation, limited specific exercise activity, or non-participation. Identification by the current American PPE screening process of high risk youth that are asymptomatic still remains a big challenge. Fortunately, most youth are healthy, will do well and enjoy their exercise related physical activity and sport participation safely!

Box 1
The 12-element AHA recommendations for pre-participation cardiovascular screening of competitive athletes *(modified)*.

Personal history
1. Exertional chest pain/discomfort
2. Unexplained syncope/near syncope (*judged not to be neurocardiogenic or vasovagal; particular concern when related to exertion*)
3. Excessive exertional and unexplained dyspnea/fatigue associated with exercise
4. Prior recognition of a heart murmur
5. Elevated systemic blood pressure

Family history
6. Premature death (sudden and unexplained or otherwise) before age 50 because of heart disease in one or more relatives
7. Disability from heart disease in a close relative younger than 50
8. Specific knowledge of certain cardiac conditions in family members: HCM or dilated cardiomyopathy, long QT syndrome, other ion channelopathies, Marfan syndrome, or clinically important arrhythmias

Physical examination
9. Heart murmur (*auscultation should be performed in supine and standing positions [or with Valsalva maneuver], specifically to identify murmurs of dynamic left ventricular outflow tract obstruction*)
10. Femoral pulses to exclude aortic coarctation
11. Physical stigmata of Marfan syndrome
12. Brachial artery blood pressure (*sitting position*) preferably taken in both arms

Box 2
Cardiovascular preparticipation screening history (1)
Symptoms
Unusual fatigue associated with physical activities
Pain, discomfort, or feeling of pressure in chest during exercise
Presyncope or syncope (fainting) during or after exercise, emotion, or startle
Exercise-associated dizziness
Exercise-associated shortness of breath
Heart racing or skipping beats

Medical or personal history and review of systems
Unexplained seizures or seizure-like episodes
Unexplained episodes of exercise-induced asthma or asthma-like symptoms
Recent febrile illness
Detailed history of any congenital structural heart disease
Use of a cardiac pacemaker or implanted cardiac defibrillator
History of Kawasaki disease
History of rheumatic fever
Known heart murmur
Known high cholesterol or lipid disorder
Systemic hypertension
Diabetes mellitus
Thyroid disease
Any previous recommendations to restrict physical activity
Use of therapeutic medications
Use of dietary supplements or over-the-counter medications
Substance abuse or tobacco use
Use of excessive caffeine or energy drinks

Family history
Sudden or unexpected death of family members before age 50 (include deaths due to possible sudden infant death syndrome, automobile accident, or drowning)
Coronary artery disease before age 50
Family members using pacemaker or implanted cardiac defibrillator
Family history of congenital deafness
Family history of certain cardiovascular diseases, such as Marfan syndrome, cardiomyopathies, long QT syndrome, short QT syndrome, or Brugada syndrome
Family history of lipid disorders, diabetes mellitus, or systemic hypertension
Family history of primary pulmonary hypertension

Table one. (Modified from [1]); *= [Higher risk in USA]

Heart Conditions That Increase Young Athletes' Risk for Sudden Cardiac Death

- Anomalous origin of coronary artery (*second most common cause in the United States*)*
- Aortic valve stenosis*
- Aortic dissection (*usually complication of Marfan syndrome*)*
- Arrythmogenic right ventricular cardiomyopathy (*most common cause in Italy*)
- Brugada syndrome (*more prevalent in those of Asian descent*)
- Hypertrophic cardiomyopathy (*most common cause in the United States*)*
- Dilated cardiomyopathy*
- Coarctation of the aorta*
- Congenital heart block (*Mobitz Type II, complete or third degree*) *
- Congenital or acquired long QT syndromes*
- Coronary artery disease (*rare in those younger than 35 years of age*)
- Restrictive cardiomyopathy
- Endocarditis
- Ehlers-Danlos syndrome *
- Mitral valve prolapse
- Myocarditis *
- Pericarditis
- Postoperative congenital heart disease*
- Status post heart transplant
- Kawasaki disease (*with coronary artery abnormalities*)
- Wolff-Parkinson-White syndrome *

References

1. Patel DR, Luckstead EF. Update on Cardiovascular Screening: Can We Prevent Sudden Cardiac Death in Adolescent Athletes? AMSTARs Adolesc Med (April 2013); 12: 225-241.
2. Myerburg RJ, Vetter VL. Electrocardiograms should be included in preparticipation screening of athletes. Circulation. 2007; 116(22):2616-2626
3. Asif IM, Rao AL, Drezner JA. Sudden cardiac death in young athletes: what is the role of screening? Curr Opin Cardiol 2013; 28(1):55-62
4. Maron BJ, Thompson PD, Ackerman MJ, et al. Recommendations and considerations related to preparticipation screening for cardiovascular abnormalities in competitive athletes: 2007 update. Circulation. 2007; 115:1643-1655
5. Weiner RB, Hutter AM, Wang F et al. Performance of the 2010 European Society of Cardiology criteria for ECG interpretation in athletes. Heart. 2011; 97(19):1573-1577
6. Mahle WT, Sable CA, Matherne PG, et al. Key concepts in the evaluation of screening approaches for heart disease in children and adolescents: a science advisory from the AHA. Circulation. 2012; 125(22):2796-2801
7. Drezner JA, Ackerman MJ, Cannon BC, Corrado D, Heidbuchel H, Prutkin JM, Salerno JC, Anderson J, Ashley E, Asplund CA, Baggish AL, Börjesson M, Difiori JP, Fischbach P, Froelicher V, Harmon KG, Marek J, Owens DS, Paul S, Pelliccia A, Schmied CM, Sharma S, Stein R, Vetter VL, Wilson MG. Abnormal electrocardiographic findings in athletes: recognizing changes suggestive of primary electrical disease. Br J Sports Med. 2013; 47(3):153-67
8. Drezner JA, Ashley E, Baggish AL, Börjesson M, Corrado D, Owens DS, Patel A, Pelliccia A, Vetter VL, Ackerman MJ, Anderson J, Asplund CA, Cannon BC, Difiori J, Fischbach P, Froelicher V, Harmon KG, Heidbuchel H, Marek J, Paul S, Prutkin JM, Salerno JC, Schmied CM, Sharma S, Stein R, Wilson M. Abnormal electrocardiographic findings in athletes: recognizing changes suggestive of cardiomyopathy. Br J Sports Med. 2013; 47(3):137-52.

Table Two - European Society of Cardiology Criteria for ECG interpretation in athletes

2005	2010
P wave	**Group 1**
Left atrial enlargement	**Common and training-related ECG changes** (up to 80%)
Right atrial enlargement	Sinus bradycardia
QRS complex	First degree atrioventricular block
Frontal plane axis deviation	Incomplete right bundle branch block
Increased voltage	Early repolarization
Abnormal Q waves	Isolated QRS voltage for left ventricular hypertrophy
Right or left bundle branch block	**Group 2**
R or R' in V1 ≥ 0.5 mV in amplitude and R/S ratio ≥ 1	**Uncommon and training-related ECG changes**
ST-segment, T waves and QT interval	(Less than 5%)
ST-segment depression or T-wave flattening or inversion in ≥ 2 leads	T-wave inversion
	ST-segment depression
Prolongation of heart rate corrected QT interval	Pathological Q waves
Rhythm and conduction abnormalities	Left atrial enlargement
Premature ventricular beats or more severe ventricular arrhythmias	Left-axis deviation/ left anterior hemiblock
	Right-axis deviation/left posterior hemiblock
Supraventricular tachycardia atrial fibrillation/flutter	Right ventricular hypertrophy
Short PR interval with or without 'delta' wave	Ventricular pre-excitation
Sinus bradycardia with resting heart rate ≤ 40 beats/min	Complete right or left bundle branch block
First, second, or third degree atrioventricular block	Long or short QT interval
	Brugada-like early repolarization

Treating the Breastfeeding Mother: Choosing an Appropriate Drug

by Thomas W. Hale, R.Ph., Ph.D.

INTRODUCTION:

The interest in breastfeeding is at an all time high, with approximately 77% of women leaving the hospital breastfeeding. This is clearly due to the enormous benefits to health that have been documented in the last decade. Infants fed human milk experience significantly reduced rates of acute and chronic diseases. Infants who do not receive human milk cost the health care system over $13 billion each year and result in over 900 unnecessary infant deaths annually.

Compared with the breastfed infant, formula-fed infants face much higher risks of infectious morbidity. In the first year alone, the risk of otitis media in formula-fed infants is doubled compared to breastfed infants. An extensive literature supports higher risks of lower respiratory tract infections (66%), gastrointestinal infections (2.8 fold, meta analysis of 14 studies), necrotizing enterocolitis (>2.4-8 fold), and a higher death rate (1.3 fold) if infants are fed formula.

The mother benefits from breastfeeding as well, including an enhanced weight loss and a major reduction in the risk of breast cancer. Numerous studies now confirm that the longer a mother breast feeds, the greater the reduction in risk of breast cancer (up to 36%).

While recent studies have clearly suggested that the number of women who choose to breastfeed is rising, the number of women who discontinue breastfeeding to take a medication is simply too high.

Surveys in other countries indicated that 90-99% of women will receive some medication during the first week postpartum, and virtually all will consume medications throughout the breastfeeding period. In Scandinavian women who discontinue breastfeeding prematurely, the use of medications is a major reason. While the drugs used early postnatally primarily include analgesics, methylergonovine, antihypertensives, and sedatives, many other mothers are now consuming antidepressants, antipsychotics, anti-epileptics, antibiotics, steroids, and many other medication classes. Hence, the relative number of medications that an infant is exposed to seems to be rising.

Because so many women ingest medications during the early neonatal period, one of the most common questions encountered concerns the use of various drugs in breastfeeding mothers. Almost invariably, most

physicians and pharmacists [without having done a thorough study of the literature] simply review the package insert and advise the mother not to breastfeed. Most often, advice to discontinue breastfeeding is inaccurate and unnecessary. Most mothers could easily continue to breastfeed their infants and take the medication without a major risk to the infant.

In the past 20 years, we have developed a proficient understanding of the kinetics of drug transfer into human milk. Most of the physiochemical properties that facilitate transfer into milk (molecular weight, pKa, lipophilicity, oral bioavailability) are known and understood. The following review will describe in some detail the transfer of medications into human milk and the implications of this transfer on the infant.

The Milk Compartment:

During gestation the milk ducts migrate backwards from the nipple via the breast fat pads, terminating into extensive lobulo-alveolar clusters (grape-like) (Figure1).[1] Each alveolus is lined with a single layer of polarized secretory epithelial cells (called lactocytes) which synthesize human milk. Human milk consists of hundreds of unique proteins and peptides, lipopolysaccharides, secretory IgA, insulin growth factor-1, and other components designed to protect the infant from infection, and provide ideal nutrition and growth.

After delivery of the placenta, estrogen and progesterone levels drop to baseline levels. This generally occurs by approximately 40 hours postpartum. At this point, prolactin dramatically stimulates the lactocytes to produce milk. During this terminal growth phase, lactocytes connect to one another via an apical junctional complex that functions to inhibit direct paracellular exchange of substances from the maternal to the milk compartment during lactation.

One week postpartum, the milk compartment is almost completely isolated from the maternal compartment and is virtually closed to the entry of substances from the maternal plasma. At this time, it is almost identical to the blood-brain barrier. Because of this tight compartmentalization, most drugs are excluded from the milk compartment. But this exclusion is a function of maternal plasma levels, the physicochemistry of the drug, and other chemical properties. Drugs that are large in molecular weight (> 800 daltons), highly water soluble (polar), and highly protein bound (> 80%), are virtually excluded from the milk compartment. On average, less than 1% of the maternal dose of most drugs enter the milk compartment.

The age of the infant is also a major concern. Newborn infants during the first 4 days are of minimal concern, as the volume of colostrum is minimal (30-160 cc/day), hence the dose of the drug delivered is minimal. Infants 1 week to 6 months are at higher risk, due to higher volume of milk ingestion. Infants > 1 year of age are at minimal risk, due to declining milk volume, and increased clearance in older infants. Thus, be more careful with young infants, and don't worry so much about older infants.

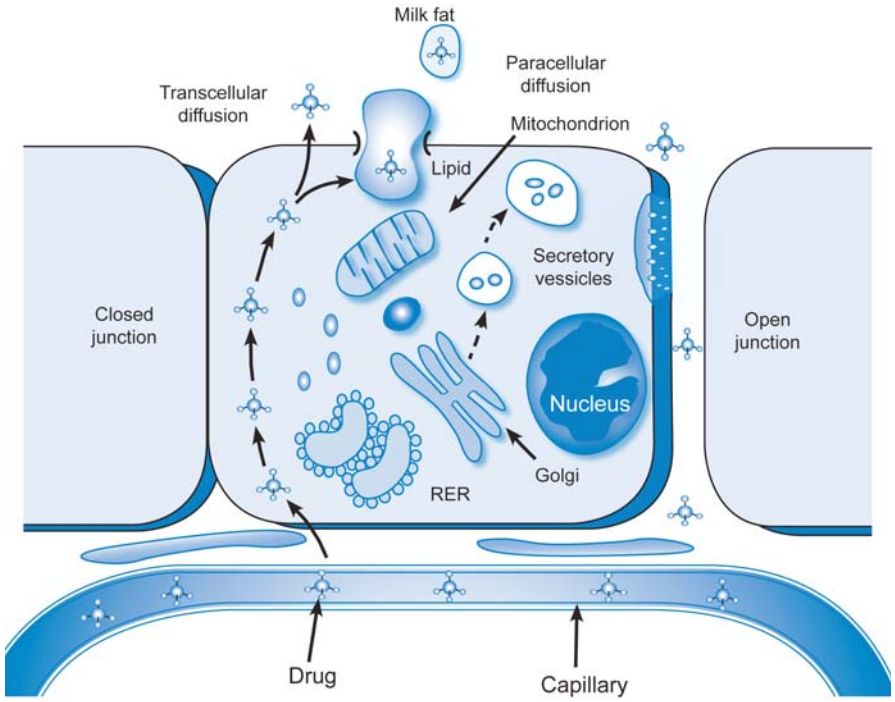

Figure 1. Transport of medications through the alveolar epithelial cell
** Adapted from Hale TW, Hartmann PE. Textbook of Human Lactation. Amarillo: Hale Publishing; 2007.*

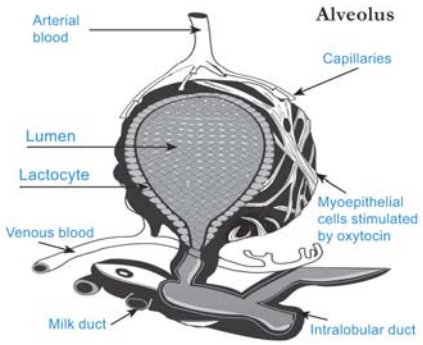

Figure 2. Structure of the alveolar subunit with blood supply and other structures
** Adapted from Hale TW, Hartmann PE. Textbook of Human Lactation. Amarillo: Hale Publishing; 2007.*

Selected Drug Classes

Analgesics

Analgesics compose the most commonly used agents in breastfeeding mothers and are used most commonly early postpartum. These include the non-steroidal anti-inflammatory drugs (ibuprofen, naproxen, celecoxib), hydrocodone, oxycodone, morphine, and fentanyl. All are considered relatively safe when used in moderate to low doses in breastfeeding mothers.[2] Always observe the infant for somnolence and respiratory rate.

Antibiotics

With exception of three antibiotics (erythromycin, nitrofurantoin, and sulfonamides), all other antibiotics are considered safe to use in breastfeeding mothers (Table 1). Erythromycin, used the first month of life, may increase the risk of pyloric stenosis, and should be avoided in breastfeeding mothers. Nitrofurantoin and sulfonamides may displace bilirubin from its albumin-binding sites, and should be avoided in infants with hyperbilirubinemia. Of the tetracyclines, doxycycline is relatively safe to use in breastfeeding mothers, but for no longer than 3 weeks. Levels in milk

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are exceedingly low, and it is the least likely to produce dental staining. All the cephalosporins, penicillins, and new macrolides(azithromycin) are quite safe to use.[3]

Antidepressants/Antipsychotics

Interestingly, the most commonly studied drugs in breastfeeding mothers are the antidepressants. Almost 15% of breastfeeding mothers consume an antidepressant for the treatment of depression, anxiety, or other disorders. More than 100 mother-infant pairs have been studied with fluoxetine, and more than 60 have been studied with sertraline. All these studies confirm that the level of transmission of these drugs to the infant is relatively low (Table 2). Using the Relative Infant Dose estimation (% of mom's dose that is transferred to the infant via milk), most are less than 9% of the maternal dose.[4]

Most importantly, prior concerns concerning exposure to these drugs during gestation or breastfeeding have been answered. It is all but certain that these drugs do not alter the neurobehavioral outcome in exposed infants. The most dangerous complication is "untreated" depression or psychosis. This we know seriously alters neurobehavioral outcome in infants. It is now the standard of care to opt for treatment of depression and anxiety disorders in pregnant and breastfeeding mothers. Postpartum psychosis can be safely treated with atypical antipsychotics while mothers are pregnant or breastfeeding. Levels in breastmilk are very low.

Anticonvulsants

Most of the anticonvulsants have been studied in breastfeeding mothers and most are safe. Lamotrigine produces relatively high plasma levels in infants for about 3 weeks; the levels fall significantly thereafter, probably due to increased renal output. It is extremely popular for the treatment of mania, and can safely be used in breastfeeding mothers. Valproic acid, while producing low levels in milk, should be avoided today. New data clearly show that valproic acid interrupts brain development and lowers IQ, particularly in the third trimester of pregnancy, and probably during the first year of life. It should also be avoided in women early postpartum, because of the relatively high risk of pregnancy and its classic teratogenicity.

Other Safe Agents

Hundreds of other drugs are quite safe in breastfeeding mothers. These include the proton pump inhibitors, all of the antiasthmatic preparations (budesonide, fluticasone, albuterol, levalbuterol, etc.), heparin, low molecular weight heparins, infliximab, interferons, and many others.

Table 1. Relative Infant Dose and Clinical Significance of Antibiotics[4]

Drug	Relative Infant Dose (%)	Lactation Risk Category
Amoxicillin	1	Safest
Ampicillin	0.3	Safest
Ampicillin + Sulbactam	0.5	Safest
Gentamicin	2.1	Safer
Tobramycin	0-2.6	Probably Safe
Cefazolin	0.8	Safest
Cephalexin	0.5	Safest
Cefuroxime	0.6	Safer
Ceftriaxone	4.1	Safest
Erythromycin	1.4	Safest
Clarithromycin	2.1	Safest
Azithromycin	5.9	Safer
Clindamycin	1.6	Safer

Table 2. Relative Infant Dose and Clinical Significance of Psychotropic Drugs[4]

Antidepressant	Relative Infant Dose (%)	Lactation Risk Category
Citalopram	3.6	Safer
Escitalopram	5.3	Safer
Fluoxetine	5-9	Safer
Sertraline	0.54	Safer
Paroxetine	1.4	Safer
Venlafaxine	8.1	Probably Safe
Olanzapine	1.6	Probably Safe
Quetiapine	0.09	Safer
Risperidone	4.3	Probably Safe
Valproic Acid (VPA)	1.4-1.7	Probably Safe
Carbamazepine	5.9	Safer
Lithium	30.1	Probably Safe with close observation
Lamotrigine	9.2%	Probably Safe

Summary

All medications transfer into human milk to some degree. However, few actually produce clinically relevant levels in infants. The most important information about a drug is its Relative Infant Dose. This estimate of the infant's exposure gives the prescriber a relatively accurate estimate of just how much medication the infant will receive daily.

If the RID is low, then the medication is probably safe to use. As a general rule, when the Relative Infant Dose rises above 10%, we become more concerned, and clinicians should be more cautious concerning breastfeeding of the infant.

Each mother/infant pair must however be individually evaluated to determine a risk-benefit analysis of this infant. Infant factors that must be included are: prematurity, apnea, weakness, renal or liver failure, or other factors that would reduce the infant's ability to adapt and tolerate the medication.

While the infant has nothing to gain from exposure to most medications, in most instances, the level of exposure is far subclinical. Then the most important factor to consider, is maintaining the breastfeeding relationship. Formula-fed infants are known to have higher rates of GI syndromes, upper respiratory tract infections, and numerous other syndromes. Thus, it is sometimes far riskier to use formula than a mother's own milk.

In most situations, there are numerous medications that can be safely used for specific syndromes. Further, you always have multiple choices for most conditions, and choosing a medication that enters milk poorly should be your goal. Physicians and other health care providers are advised to carefully choose those medications with lower Relative Infant Doses and fewer side effects in infants.

References

1. Hale TW, Hartman PE. Textbook of Human Lactation. Amarillo: Hale Publishing LPL; 2007.
2. Findlay JW, DeAngelis RL, Kearney MF, Welch RM, Findlay JM. Analgesic drugs in breast milk and plasma. Clin.PharmacolTher. 1981;29(5):625-633.
3. Matsuda S. Transfer of antibiotics into maternal milk. Biol Res Pregnancy Perinatol. 1984;5(2):57-60.
4. Hale TW. Medications and Mothers' Milk. Amarillo: Hale Publishing, LP; 2012.

Fetal Echocardiography: Diagnosis and Management of Congenital Heart Disease

by Srilatha Alapati, M.D.

Prenatal diagnosis and management of congenital heart disease is an evolving field in cardiology and is helpful for the obstetrician, neonatologist and the cardiologist in planning the optimal care for the mother, fetus and the newborn baby. With advances in ultrasound technology, fetal echocardiography has proved to be a very important diagnostic imaging tool to evaluate the structural or functional abnormalities of the fetal heart. In addition, fetal diagnosis of cardiac lesions will help in planning the deliveries in tertiary care centers with facilities of maternal fetal medicine and pediatric cardiology.

Congenital heart disease affects 6-8 per 1000 live births, at least half of which can be detected prior to birth. The screening obstetric ultrasound at around twenty weeks gestation with imaging of the 4-chamber view (Fig. 1) and the left and right outflow tracts of the heart can detect 20-30% of the malformations; this number can be significantly increased in the hands of trained maternal fetal medicine specialists. Obtaining the fetal echocardiogram, however, can provide detailed diagnosis of 80% of heart defects and can further help in counseling and management.[1] Prenatal diagnosis can improve the survival rate up to 50% when compared to neonates without prenatal diagnosis.[2]

Currently there are many indications for fetal echocardiography which include fetal, maternal and familial risk factors as described in Table 1.

The detection rate of a fetal cardiac defect is closely related to the experience of the ultrasonographer, the timing of the examination, and the equipment used. The optimal timing for a fetal cardiac evaluation is between 18-24 weeks gestation. Serial echocardiograms are useful for evaluation of congenital heart disease with anticipated progression (such as valve lesions, hypoplasia, and cardiomegaly), cardiac function, rhythm anomalies, and pericardial effusions. (Fig. 2)

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TABLE 1

Fetal Indications
- Suspected chromosal anomalies
- Suspected congenital heart defects by screening obstetric ultrasound
- Rhythm abnormalities like irregular heart rate
- Fetal tachycardia (>200 bpm) and sustained bradycardia
- Hydrops fetalis (~25% CHD)
- Poly or oligohydraminos
- Increased nuchal translucency and/or thickness
- Echogenic foci and multiple pregnancy (monozygous or conjoined twins)
- Extracardiac defects
  - Central nervous system abnormalities
    - Hydrocephalus
    - Microcephalus
    - Agenesis of the corpus callosum
    - Encephalocele
  - Mediastinal defects
    - Diaphragmatic hernia
  - Gastrointestinal anomalies
    - Esophageal atresia
    - Duodenal atresia
    - Abnormal situs
    - Anorectal anomalies
  - Abnominal wall defects
    - Omphalocele
    - Ectopia cordis
  - Genitourinary abnormalities
    - Hydronephrosis
    - Renal agenesis
    - Renal dysplasia
    - Horseshoe kidney

Maternal Indications
- Exposure to teratogens
  - Coumadin
  - ACE inhibitors
  - Anticonvulsants
  - Alcohol
  - Retinoic acid
  - Lithium
  - SSRI antidepressants
- Exposure to high doses of ionizing radiation
- Augmented reproductive techniques like IVF
- Abnormal triple screen
- Maternal metabolic diseases
  - Diabetes mellitus
  - Gestational diabetes
    - Phenylketonuria and connective tissue disorders (SLE, Sjogren syndrome);
- Maternal infections
  - TORCH infections
  - Mumps

Familial Indications
- Congenital heart disease in siblings or parents
- Consanguinity
- Mendelian syndromes
  - DiGeorge syndrome
  - Tuberous sclerosis
  - William syndrome
  - Ellis-Van Creveld syndrome
  - Noonan syndrome

A complete and uncomplicated fetal cardiac exam can take between 30-60 minutes. The fetal echocardiogram should include detailed imaging using 2- dimensional, M- mode, pulse wave Doppler and color Doppler techniques. Standard views are obtained to evaluate the anatomy of the chambers, valves, walls, and vessels of the heart and as well size and function of the heart. The standard views include: fetal lie and position, fetal visceral situs, cardiac position, four-chamber anatomy, (Fig. 2) great vessels and their relationships, atrioventricular and semilunar valves, aortic and ductal arches, shunting at foramen ovale and ductus, systemic and pulmonary veins, cardiac chamber dimensions /cardiothoracic index, wall thicknesses, valve/vessel dimensions, fetal heart rate and rhythm, umbilical cord, pericardial and extracardiac spaces for fluid accumulation, short axis view/sweep (3 vessel view), caval long axis view, ductal arch and aortic arch views (Fig. 3) along with systematic Doppler examination of atrioventricular and semilunar valves, systemic and pulmonary veins, ductus venosus, foramen ovale, ductus arteriosus, aortic arch, and umbilical vessels. Although it is often difficult to follow a sequence of scanning, every effort should be made to evaluate the fetal heart in which ever order they may be best obtained.[3,4]

The fetal rhythm can be evaluated using M mode recordings of atrial and ventricular wall motion; simultaneous pulse wave Doppler of ventricular inflow and outflow tracts, with simultaneous superior vena cava and aortic Doppler.[5] Premature atrial contractions are the most commonly encountered rhythm anomalies in the fetal life; this is a benign condition and may resolve by the time of next scan or delivery. Premature ventricular contractions, however, may require further evaluation during fetal life and as well in postnatal period.

Fetal tachyarrhythmias with a sustained rate over 200 bpm warrant immediate attention, as they can result in cardiac compromise and hydrops. Medical management can control most of these arrhythmias but in rare occasions, early delivery may be required. Ventricular tachyarrhythmias are very rare but may be the consequence of myocardial compromise or cardiac tumors and need immediate attention for treatment. Any fetus with tachyarrhythmias, even though hemodynamically stable, requires frequent follow-up imaging to evaluate the cardiac function and fetal hydrops.[4]

Bradyarrhythmias with fetal heart rate of 100 bpm or less are usually encountered during episodes of vagal stimulation, fetal distress or systemic disease. During cardiac ultrasound examination, short periods of self-recovering bradycardia are commonly encountered. Maternal autoimmune diseases (SLE or Jorgen Syndrome) are the main reasons for fetal brady-

cardia, usually due to fetal atrioventricular block.[5] Any AV block in the fetus warrants maternal investigation since maternal autoimmune disease may not be symptomatic at the time of fetal bradyarrhythmia diagnosis. Certain medical treatments (maternal plasmapheresis, dexamethasone) are being tried in mothers of fetuses with AV block.[4] If cardiac dysfunction or fetal distress is noted, early delivery should considered.

Management of the fetus with congenital heart disease requires multidisciplinary approach including consultation of neonatology, genetics, pediatric cardiology, and cardiac surgery. Every effort should be made to avoid the premature delivery, as immature lungs can complicate the prognosis of congenital heart disease. Fetal interventions like balloon valvuloplasty, balloon atrial septostomy and fetal pericardiocentesis are emerging techniques that are being considered by some centers in order to alter the postnatal outcomes.

The goal of prenatal cardiac diagnosis is that delivery can be planned at a tertiary care center for lesions that require immediate attention after the delivery. Emergent delivery is not needed for heart defects unless there is evidence of fetal compromise or sustained hemodynamically significant arrhythmia.

Limitations of the fetal echocardiogram include technical difficulties such as fetal position, maternal obesity, poly or oligohydramnios, or advanced gestational age. Defects that progress such as insufficiency or stenosis of the valves or hypertrophy can be missed in the early fetal scans. Cardiac defects with subtle findings like coarctation of the aorta, PAPVR, coronary artery anomalies and small VSDs can be missed. Cardiac lesions with transitional circulation such as PFO or ASD and patent ductus arteriosus cannot be assessed during fetal life.

References:

1. Yagel S, Weissman A, Rotstein Z, et al. Congenital heart defects: natural course and in utero development. Circulation 1997;96(2):550-5.

2. Bahtiyar MO, Copel JA. Improving detection of fetal cardiac anomalies: a fetal echocardiogram for every fetus? J Ultrasound Med 2007;26(12):1639-41.

3. Pediatric Council of the American Society of Echocardiography. American Society of Echocardiography Guidelines and Standards for Performance of Fetal Echocardiogram. J Am Soc Echocardiography 2004; 17:803-10.

4. Gurur Biliciler-Denktas. Fetal Echocardiography I. Neonatology Today 2009:4(8):1-5.

5. Hornberger LK, Sahn DJ. Rhythm Abnormalities of the Fetus. Heart 2007; 93:1294-1300.

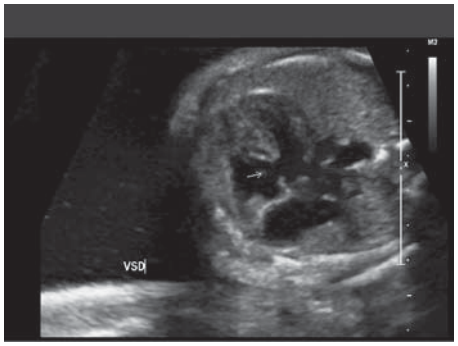


Figure 1: Four chamber view showing the ventricular septal defect (VSD)

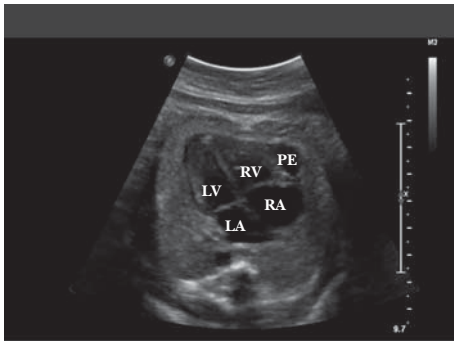


Figure 2: Four chamber view showing the pericardial effusion. LV - left ventricle; RV - right ventricle; LA - left atrium; RA - right atrium; PE - pericardial effusion

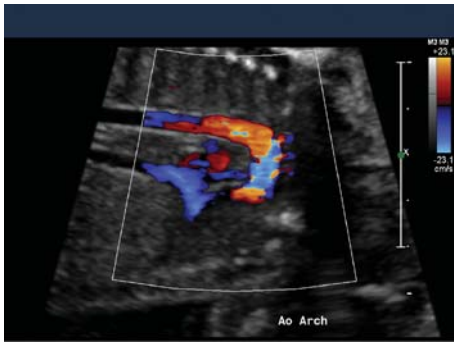
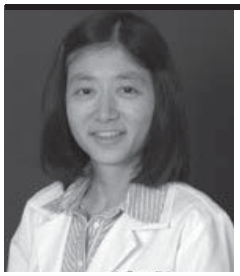


Figure 3: Aortic arch view with color Doppler showing the transverse arch with brachiocephalic vessels



Nurse-Family Partnership: A Home Visiting Program Serving Mothers and Infants Comes to Amarillo

by Angela Huang, M.D.

Abstract

Texas Tech University Health Sciences Center (TTUHSC) at Amarillo is pleased to announce the start of its Nurse-Family Partnership program. This evidence-based, community health program transforms the lives of vulnerable, first-time mothers. Each mother is partnered with a registered nurse during her pregnancy and receives ongoing nurse home visits that continue through the child's second birthday. Goals include improving pregnancy outcomes, improving child health and development, and improving the economic self-sufficiency of the family. Independent research has also shown benefits to communities – every dollar invested in Nurse-Family Partnership can yield more than 5 dollars in return.

Article

The TTUHSC at Amarillo Department of Pediatrics is pleased to announce the start of the Nurse-Family Partnership in Amarillo. This program pairs vulnerable first-time mothers with trained nurses to provide guidance and support throughout pregnancy and the first two years of the child's life. Participation in the program improves health, as well as developmental and economic outcomes, for high-risk mothers and children.

Nurse-Family Partnership is an evidence-based, community health program. It is based on the work of David Olds, Ph.D., Professor of Pediatrics, Psychiatry, and Preventative Medicine at the University of Colorado. The program is currently implemented in 42 states, including Texas. Key program components include the enrollment of first-time, at risk mothers, the provision of services by a Bachelor's prepared nurse, intensive services over a long period of time (up to 2 and a half years), focus on positive behavior change, and focus on fidelity to the program model. The program specifies that clients are first-time parents as this has been identified as a period in a person's life course when they are more likely to demonstrate willingness to change. Services are provided by nurses as they are seen by clients to be knowledgeable, credible sources of information while being nonjudgmental and approachable at the same time. Nursing theory and practice are at the core of the Nurse-Family Partnership model.

Home visits focus on six core areas. These are Personal Health, Maternal Role, Environmental Health, Family and Friends, Life Course Development, and Health and Human Services. Visits may begin at 16 weeks into the pregnancy and continue until the child's 2nd birthday. Goals include improving pregnancy outcomes, improving child health and development, and improving families' economic self-sufficiency. Pregnancy outcomes are improved by helping women engage in good preventative health practices, including prenatal care from their healthcare providers; improving their diets; and reducing use of cigarettes, alcohol, and illicit substances. Child health and development is improved through helping parents provide responsible and competent care. Improved economic self-sufficiency for families is achieved through helping parents develop a vision for their own future, plan future pregnancies, continue their education, and find employment.

Outcomes data obtained over more than 30 years have demonstrated the effectiveness of Nurse-Family Partnership. Three large randomized, controlled trials have been conducted since 1977. Among multiple positive outcomes are higher language scores at age four(1), higher academic achievement scores at age nine(2), fewer hospital days for injuries(3), increased time between first and second births for the mother(4), fewer months receiving public assistance(5), and fewer months on food stamps(6). In Texas, 90% of babies born to Nurse-Family Partnership clients were born full term. 91% of babies were born at a healthy birth weight above 2500g. 87% of mothers initiated breast feeding. 87% of children received all recommended immunizations by 24 months.

In addition to the individual benefits to mothers and children, there are demonstrated benefits to society. Studies by the RAND Corporation in 1998 and 2005 estimated that Nurse-Family Partnership returns up to $5.70 for each dollar invested in the program. A study by the Washington State Institute of Public Policy in 2012 found that Nurse-Family Partnership returns more than $23,000 over program costs for each family enrolled. Savings to society accrue from fewer funds spent in health care, child protection, education, the criminal justice system, mental health, and public assistance as well as increased tax revenue from employed parents.

Nurse-Family Partnership has been in operation in the state of Texas since 2007. The program currently has 18 sites serving 28 counties. A needs assessment by the Department of State Health Services (entitled Texas Home Visiting Needs Assessment for the Affordable Care Act Maternal, Infant, and Early Childhood Home Visiting Program) identified the Panhandle Health Region as one of the most needy regions in the state with respect to indicators such as percent of preterm births, low birth weight babies, infant mortality rate, rates of domestic violence, binge drinking, illicit drug use, juvenile crime, and child abuse. The Nurse-Family Partnership program in Amarillo is the first in the northern Panhandle and hopes to have a positive impact on these areas.

The TTUHSC at Amarillo Nurse-Family Partnership program is currently accepting referrals. Criteria for enrollment include being a first-time parent at or before the 28th week of pregnancy, income level at or below 185% of the federal poverty level, and residence in Amarillo. For questions or to refer a potential client who can benefit from our services, please call 806-356-5964.

This program is funded by a federal grant awarded to the Texas Health and Human Services Commission from the U.S. Department of Health and Human Services.

This program is also part of TTUHSC's Home Visiting Program, which includes the following three additional home visiting programs – Parents as Teachers, Home Instruction for Parents of Preschool Youngsters (HIPPY) programs and Early Head Start Home Visiting Program. These evidence-based programs help parents prepare their children from birth through age-five, for success in school and beyond.

Bibliography

1. Olds DL, Robinson J, Pettitt LM, Dennis W. Luckey DW, Holmberg J, Ng RK, Isacks K, Sheff KL, Henderson CR. Effects of Home Visits by Paraprofessionals and by Nurses: Age Four Follow-up Results of a Randomized Trial. Pediatrics. 2004; 144(6):1560-8.

2. Olds DL, Kitzman HJ, Hanks C, Cole R, Anson E, Sidora-Arcoleo K, Luckey DW, Henderson CR, Holmberg J, Tutt RA, Stevenson AJ, Bondy J. Effects of Nurse Home Visiting on Maternal and Child Functioning: Age Nine Follow-up of a Randomized Trial. Pediatrics. 2007; 120:e832-e845.

3. Kitzman H, Olds DL, Henderson CR, Hanks C, Cole R, Tatelbaum R, McConnochie KM, Sidora K, Luckey DW, Shaver D, Engelhardt K, James D, Barnard K. Effect of Prenatal and Infancy Home Visitation by Nurses on Pregnancy Outcomes, Childhood Injuries, and Repeated Childbearing: A Randomized Controlled Trial. JAMA. 1997; 278(8):644-652.

4. Kitzman H, Olds DL, Sidora K, Henderson CR, Hanks C, Cole R, Luckey DW, Bondy J, Cole K, Glazner J. Enduring Effects of Nurse Home Visitation on Maternal Life Course: A Three-Year Follow-up of a Randomized Trial. JAMA. 2000; 283:1983-1989.

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Teenage Drug Scene in the Panhandle of Texas

by Shu Shum, M.D., Jeanie Jaramillo and Cristie Johnson

Abstract:

Teenage years are a turbulent time for our society and many families. Teenage youngsters may experiment with different objects and various chemical agents; they usually start with what is readily available to them at home or in school, with families and with friends. One should keep an open mind when working with teenagers, sharing their concerns, interests and problems, in order to counsel them and be available to them for discussions that are important to them. One should never be judgmental and demeaning to the teenagers' concerns and their problems.

The Texas Panhandle Poison Center handles approximately twenty five thousand telephone calls per calendar year; eighty per cent of the calls are related to patient exposure to an adverse chemical. The majority of these calls are handled at the site of exposure, with only about twenty per cent of the victims sent to a healthcare facility, where the victims are observed, cared for and managed appropriately.

According to a recent survey done in January 2013, about forty percent of teenage children consumed alcohol in the past year; twenty five percent of the surveyed teenagers smoked marijuana or its synthetic varieties; twenty percent smoked cigarettes and about twenty five percent used synthetic, prescription or non-prescription drugs. Two third of the survey participants were from intact, two-parent traditional families from the Panhandle area of Texas.

Various theories on adolescent drug use illustrate the current disagreement on the basic mechanisms that lead one to drug abuse and addiction. The local data demonstrate that intact families with both parents do not prevent teenagers from abusing drugs and other chemicals. Specifically, without their parents' direct engagement in discussions with the teenagers on these topics of drug and alcohol use and abuse regularly, the teenagers may feel disconnected from their other family members and their parents. Healthcare professionals should encourage early and frequent discussions of these topics in family gatherings and around the dinner tables to express the parental concerns and to provide compassionate guidance. Avoid being judgmental; by inviting input from the teenagers, one can obtain cooperation and participation in a healthy, caring environment.

Recently, an Amarillo police school officer found 2 teenage school girls smoking synthetic marijuana at a park across from a school in a normal school day. The two students were taken to the school nurse's office for evaluation. The school nurse contacted the Texas Panhandle Poison Center to report the exposure of synthetic marijuana and reported that both students were experiencing physical symptoms of tachycardia and hypertension. Their past medical histories were unremarkable for both students.

Student 1 had BP of 177/99 with heart rate 118 and Student 2 had BP 162/98 with heart rate 108. Both students were alert and responsive, with appropriate mentation for age. They were sent to a local hospital for further evaluation and observation. They were discharged 3-4 hours later with normal vital signs.

Today's teenagers often spend their allowance from their parents, or earned money from odd jobs like waiting tables, mowing lawns, baby sitting or delivering morning newspaper routes, to purchase what they may want, including recreational drugs and computer games.

Marijuana has a therapeutic use; for instance, it is used legally to treat glaucoma and to treat nausea and dyspepsia associated with cancer chemotherapy. Teenagers abuse the marijuana and synthetic marijuana in order to obtain the perception altering characteristics of the drugs to get

"high." Other symptoms of marijuana use include: altered mental status, somnolence, dizziness, fatigue, euphoria and occasional abdominal pain, nausea and vomiting.

Symptoms of synthetic marijuana use are similar to natural marijuana, but may also include hypertension, tachycardia, tremors, agitation, seizures and electrocardiographic changes.

Marijuana and synthetic marijuana may be purchased without much difficulty from local illegal drug dealers, school friends, and drug paraphernalia shops or via internet channels.

Sadly, most teenagers who abuse substances begin with agents found easily accessible within the teen's home, such as alcohol and tobacco. Teens may take alcohol and tobacco products from their parents' homes or other household members' residences. It is estimated that 25% of teens admit to obtaining alcohol from house parties at home. Parents need to be cognizant of the fact that they are the prime models for their teens; teenagers will learn the good attributes as well as their undesirable behaviors at home, from their parents and relatives. Drinking and smoking are prime examples of these behaviors.

Attending parties and drinking alcoholic beverages are ingrained in our American culture. Teenage children see the effects of alcohol on their parents and elders: they observe the positive effects of this potent chemical in relieving emotional tension and dissolving unnecessary inhibition, not knowing the possible side effects of excessive use of alcoholic drinks. When they encounter unpleasant situations out of their control at school or with their peers, they learn to resort to what their parents may do under those circumstances: taking a drink of alcoholic beverages and trying to relax. They may be successful for a number of attempts, without knowing that they are building up tolerance to alcohol and may become addicted to the substance. A recent survey showed that forty percent of teenagers initiate the use of alcohol at home, with or without the knowledge or approval of their parents.

As time progress on, and as the teenagers try to find new ways to cope with their daily stress, the next readily available substances at some homes are tobacco products. Our television and our media glamorize the use of these products, and teenagers see that their parents and their teachers use them on a regulas basis, prompting them to try smoking cigarettes despite the warnings on the labels of these products. Additionally, most of the adverse effects of these products are not obvious immediately, with latency periods that may span several decades of time, which an average teenage will not care to consider. They want to experience the immediate positive nicotinic effects. However, nicotine is also addictive; unknowingly the teenagers become victims of a life-long habit which will be very difficult for them to shake easily.

Synthetic chemicals, including prescription and non-prescription drugs, account for approximately twenty five percent of substance abuse amongst the teenage population in the Panhandle of Texas. These items are widely available in many households. We, the parents, want to relieve our discomfort and to ensure our convenience by having these items readily available for us to use at any time of the day or night. Our teenage children easily recognize their availability and learn their effects; they soon start to abuse them whenever they may want to escape from their reality. They may also realize that some of the prescription narcotic analgesics have "street value," and can be easily converted into cash at school playgrounds and beyond. Prescription narcotic analgesic abuse and misuse is a nationwide problem, and the Texas Panhandle is not spared of this epidemic. It is important that the family members recognize their abuse potential and eliminate them from the household as the intended purposes for the prescription are subsiding.

The staff of the Texas Panhandle Poison Center, under the leadership of Dr. Jeanie Jaramillo, initiated medication take-back campaigns in the communities that we serve, in order to decrease the availability of different medications, prescription narcotic analgesics included, in homes where these items no longer serve any meaningful purposes. Throughout the years, we have removed several tons of these medications and narcotic prescriptions. By eliminating these medications from the home environment of the communities we serve, we strive to ensure a safer environment for our children, and to decrease the potential diversion of the prescription analgesics for unintentional use. The prescription narcotics are handed over to the police department and drug enforcement agencies for proper disposal. Thus, we have extended our decontamination efforts from the victims to their home environment.

References:

1. Erich Goode, Drugs in American Society, 8th Edition, 2012.
2. Johnnie Faircloth. Adverse Reaction to Synthetic Marijuana. Am J Addiction, 21:289-290, 2012.
3. NIDA: Drug Facts, Nationwide Trends, 2012.
4. NIDA: High School and Youth Trends, 2012.

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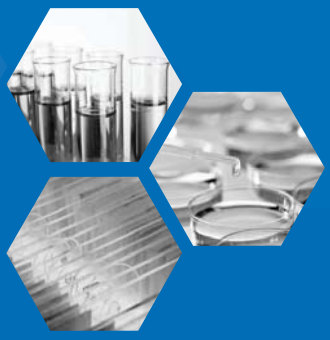

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Transition of Care in Cancer Survivors from Pediatrics to Adult Services

by Osvaldo Regueira, M.D.

Introduction

Pediatric cancers once almost uniformly fatal are now curable in up to 79% of its victims. The percentage of cure is even higher in specific cancers such as Wilms' tumor and Hodgkin's lymphoma where survival is in the 90% or better range. Unfortunately, survival may come at a high cost in the form of long term sequelae involving one or multiple organ systems. Current studies are aimed at reducing long term adverse effects without compromising survival.

With an estimated 300,000 pediatric cancer survivors, it is very likely that physicians in other specialties will see patients who have been treated for cancer during their childhood. We must therefore familiarize ourselves with the wide range of long term needs these patients have. Although the majority of sequelae result in a minimal decrease in function, some patients will experience severe long term, life changing, deficits. Complications may not arise until many years and even decades post treatment, requiring a vigilant follow up care. A brief review by system follows, this is by no means all inclusive and the reader is urged to read the references.

Review by systems.

Neurocognitive: Perhaps the most feared and life alterning sequelae are those impacting cognitive function. Some lesions (astrocytoma) may require minimal treatment while others (medulloblastoma) are located at strategic CNS locations making resection very difficult. The associated surgical procedure, chemotherapy and radiotherapy are all factors to consider. The child under 3 years of age with an as yet unmyelinized brain is particularly vulnerable with the largest decrease in IQ. Impairment in short term memory and ability to focus attention can be up to seven times those seen in patients older than 3 y. Fortunately, expressive language skills and verbal learning are largely unaffected. Very rarely focal cerebral necrosis with subsequent neurologic problems according to the area of involvement is encountered two to three months post radiation.

Auditory: deficits secondary to cochlear damage are seen with the use of platinum derivitives, aminoglucosides, loop diuretics and radiation therapy. The 60000-8000 Hertz range is most commonly involved.

Visual: Decreased visual acuity and cataracts can result from the treatment of periobital rhabdomyosarcomas at 1000 cGy. Radiation therapy (up to 4000 cGy) of retinoblastoma can cause radiation retinopathy as well as orbital hypoplasia with cosmetic impact. The development of an osteogenic sarcoma in bones within the area of radiation treatments in patients with retinoblastoma is of particular concern with an almost 50% chance of occurring by 50 years of age.

Endocrine: Of secondary endocrine disorders, obesity and gonadal dysfunction head the list. Fertility can be compromised, more frequently in male patients, due to the use of alkylating agents (nitrogen mustard, procarbazine, cyclophosphamide). Abdominal irradiation in conjunction with alkylating agents may result in ovarian failure and early menopause. Aspermia may result even from a small dose of radiation (200-300 cGy). Short stature and growth hormone deficiency may occur in up to 20% of patients. Thyroid screening may reveal dysfunction with compensated or overt hypothyroidism.

Pulmonary: toxicity secondary to bleomycin or mantle radiation may result in a marked reduction in carbon monoxide diffusion capacity. Younger individuals with developing alveoli are susceptible to oxidative injury to capillary endothelium and pneumocytes. An influx of granulocytes with the release of elastase, collagenase and myeloperoxidase may inflict severe damage and lead to irreversible fibrosis.

Cardiac: Although fortunately rare, cardiac toxicity as a complication of anthracycline therapy or high dose cyclophosphamide can present as congestive heart failure, pericarditis and ventricular arrhythmias. Most disconcerting is the time interval from administration to toxicity, which may be several years. The combination of free radical damage, focal fibrosis and dropout of myocardial muscle fibers leads to increased wall stress and afterload, which results in a dilated cardiomyopathy. Transplant may be the only hope in severe cases. Serial ECGs may detect low QR voltage, ST-T wave abnormality and QTC interval prolongation. Serial echo (2D/M) and radionucleide ventriculography may also be of value. Serum B type NP and troponin can be monitored as needed. Myocardial biopsy usually does not show significant change until damage is present, minimizing its value. Some patients experience an increase in atherosclerotic changes of coronary vessels with an increased incidence of myocardial infarct.

Gastrointestinal tract: GI symptoms are common in the active phases of chemotherapy. This is due to the high turnover rate of the enteric mucosa with active cellular growth, which is precisely the target of chemotherapy. Severe complications during treatment such as typhlytis carry a high mortality but is usually followed by full recovery if the patient survives. Some patients may develop strictures or adhesions (in case of surgery) resulting in bowel obstruction post therapy. Rarely fistulas may occur. Even less common is the development of hepatic fibrosis and portal hypertension resulting in upper gi bleeding from esophageal varices. While a common procedure in the past, splenectomy is no longer necessary for staging nor treatment in the majority of lymphomas. This avoids the increased

susceptibility to infection with encapsulated organisms and the long term association with increased thrombotic events.

Genitourinary: Once common, hemorrhagic cystitis due to the formation of acrolein from the metabolism of ifosphamide and cyclophosphamide is now rarely seen. Fanconi syndrome with profound electrolyte and protein wasting is a common complication of treatment with cisplatinum and high dose methotrexate and may be irreversible. Current promising research studies at Texas Tech are focused on preventing this complication through the use of antioxidant substances to reduce renal toxicity; these studies are at present in very early stages. In patients with renal failure dialysis and renal transplant may be needed. The wait time for transplant at present is usually one to two years.

Musculoskeletal: Complications such as skeletal hypoplasia and asymmetric bone growth are now very uncommon with the improvements in radiation therapy techniques. Avascular necrosis (AVN) of the bone continues to be a vexing problem especially in diseases such as acute lymphoblastic leukemia. There is an increase in the incidence of AVN with the use of dexamethasone when compared to prednisone. The current obesity epidemic seen in the pediatric population adds to the risk of developing AVN. The Children's Oncology Group is actively investigating treatment modification to minimize or eliminate this complication. Hip replacement may be necessary in the early 20's in some patients.

Secondary malignant tumors: Along with the increase in survival, there has been an increase in development of secondary malignancies. Carriers of the retinoblastoma gene have a 50% chance of developing a secondary malignancy by the age of 50 in those patients exposed to radiation. In comparison unirradiated carriers have a 25% chance of developing a SMT. Genetic abnormalities such as the Li-Fraumeni syndrome (P53) can result in multiple members in one family presenting with different malignancies. Patients whose treatment includes alkylating agents and epidophyllotoxins are at a higher risk for development of secondary leukemia. Allkylating agents may produce direct DNA damage and show a cumulative dose effect. Leukemias, commonly ALL, may occur 4-8 or more years post diagnosis and are usually preceded by myelodysplasia. Abnomalities of chromosome 5 or 7 or both are common. Epidophyllotoxins are associated with an increase in secondary leukemias, most commonly AML (M4 or M5). Presence of the MLL gene (11q23) increases the patient's risk. Therefore these patients should be followed once a year and have a bone marrow evaluation if any significant changes occur in their CBC.

There is an increased incidence of SMT associated with radiation therapy; both age at treatment and cumulative dose are important factors. Hodgkin's disease patients who receive mantle radiation are prone to breast cancer even decades after exposure. Acute lymphoblastic leukemia patients who require cranial irradiation may develop secondary brain tumors several years later.

Psychosocial: It should not come as a surprise that these complications can have a profound effect in the long term quality of life, with psychosocial consequences. Fertility, employment and insurability are more commo worries than self image, dying or poor health. Some studies have found cancer survivors to be less likely to obtain college degrees, less likely to marry and more likely to be unemployed than the general population. Post traumatic stress disorder has been reported in up to 12%.

In summary, as the number of pediatric cancer survivors increases it is likely that generalist physicians will assume their care. Awareness of the numerous long term complications of treatment will improve the health and quality of life of cancer survivors. Attention in particular to the psychosocial issues and co-ordination of various community services available to survivors will help us to provide the best possible care for these patients.

References:

1. American Academy of Pediatrics, Clinical Report: Long-term Follow-Up Care for Pediatric Cancer Survivors. Pediatrics, Volume 123, Number 3, March 2009.
2. Askins M, Moore BD. Preventing Neurocognitive Late Effects in Childhood Cancer Survivors. Journal of Child Neurology, Vol. 23, No. 10, October 2008.
3. Stava CJ, Jimenez C, Vassilopoulou-Sellin R. Endocrine sequelae and cancer treatments. J Cancer Surviv (2007) 1:261-274.
4. Yahalom J, Portlock CS. Long-Term Cardiac and Pulmonary Complications of Cancer Therapy. Hematol Oncol Clin N Am 22 (2008) 305-318.
5. Jones DP, Spunt SL, Green D, Springate JE. Renal Late Effects In Patients Treated for Cancer in Childhood: A Report From the Children's Oncology Group. Pediatr Blood Cancer 2008;51:724-731.

The above references and several more are available in PDF format upon request by email to regueira@att.net.

High Temps in the High Plains:
Community Trends in Reported Influenza-like Illness and Rapid Test Reporting

by Todd Bell, M.D., and Matt Richardson, M.D.

Small elephants still hurt when they sit on you. Likewise, although the severity of influenza outbreaks in a community varies from year to year, all outbreaks seem severe when you are in the clinic or wards treating patients. This year seemed a larger elephant than most. As we are now "out from under the elephant," it seems an opportune time to look at the last flu season from a local perspective to see what lessons may be garnered.

The prediction of timing and severity of an influenza outbreak is an inexact science. The 2011-2012 influenza season was relatively mild and primarily composed of Influenza A H3N2 Perth, a strain that has circulated extensively for the past several seasons. It was therefore predicted that the coming 2012-2013 influenza season would potentially be heavier and slightly earlier than our local typical peak season of early February. As the southern hemisphere influenza season got under way in the late spring of 2012, we received reports of dominance of Influenza A H3N2 Victoria, a relative newcomer to the global circulation. This provided additional evidence that the flu season would be earlier than usual and could potentially see more individuals affected. The timing of the predicted flu season starting in mid-late December raised the possibility of a "bi-modal" influenza case distribution with a peak in late December, followed by a slight lull in influenza activity and then a second peak in mid-January. Based on data from the southern hemisphere, it was also predicted that the influenza vaccine would be a good match for circulating strains.

In hindsight, some predictions were more prescient than others. We saw a peak in influenza A activity in mid-December, followed by a slight lull over the Christmas holidays, and then a second peak in influenza A in mid-January (Figure). The duration of the flu outbreak was a little longer (at least 12 weeks) compared to the typical 6-8 week influenza season. It is unclear why the influenza season was longer than usual. A new strain of Influenza (A/Victoria rather than A/Perth) results in more non-immune biomass to infect because individuals have not been previously exposed to

the virus unless they are vaccinated. There may be a strain specific virulence factor that contributed to the duration of transmission in the community. The effect of social activities (e.g. school schedules) and environmental factors on the duration of an influenza outbreak remain unexplored. Regardless the cause, the end result was a longer influenza outbreak duration than the norm. Overall, the influenza vaccine did prove to be a fairly good match, with additional discussion below. Unanticipated, though, was the relatively high incidence of influenza B late in the influenza outbreak. The majority of influenza B in our state was of Influenza B/Wisconsin lineage, which was included in the seasonal influenza vaccine. Less than 15% of influenza B cases characterized by the state laboratory was Influenza B/Brisbane, which was not included in the seasonal vaccine (1). Next year a quadravalent vaccine will likely be available, which will include 2 influenza B strains, mitigating the problem of co-circulating Influenza B strains.

Influenza is not a reportable illness in our state, so the actual number of cases in our community cannot be quantified from the data available. What we can see from the voluntarily reported data, however, is that considerable numbers of both influenza A and Influenza B cases were reported to the Health Department, a historical aberration. In most years, a single influenza type (A or B) predominates, out-competing other influenza types in a given locality. Nationally, this influenza season appears to have been moderately heavy, with twelve weeks in which the number of deaths attributable to pneumonia and influenza was above the epidemic threshold, with 110 pediatric deaths to date (2).

It is unknown how many citizens of the Texas Panhandle receive an influenza vaccination, although it is estimated that the number is around 25% (author; unpublished correspondence). The elderly tend to have better compliance with influenza vaccination recommendations, with approximately 75% of elders over age 65 receiving their influenza vaccine as determined locally by a study performed in 2010 (3). The rates of vaccination of other high risk groups, including young children, pregnant women, and those with chronic diseases are unknown in our community, but are anecdotally much lower. Unfortunately, the highest rated demographic for vaccine uptake, the elderly, are also those who tend to have less efficacy from the vaccine itself. Several studies have demonstrated that elders have lower antibody titer response to vaccines than younger patients. (4). A higher dose flu vaccine (FluZone; Sanofi) was available again this year, and some elder patients may have received that vaccine. Nevertheless, interim estimates of vaccine efficacy revealed that, although the average benefit to a given patient was a 56% reduction in risk of contracting an influenza like illness requiring medical attention, the benefit to those over age 65 was only 9% for influenza A (5). Final efficacy

| *continued on page 36*

estimates will only be available after the completion of data collection, but the discrepancy between age groups in the interim analysis was notable. Although the phenomenon of immunosenescence seems to be a significant determinant of the efficacy of vaccination, the underlying reasons have not been fully elucidated. This should not, though, be taken as a rationale not to vaccinate. On the contrary, these results highlight the importance of vaccinating all eligible recipients so as to protect those most vulnerable in a population. In 2012, the Texas State Legislature mandated the development of policies to insure the vaccination of health care workers at inpatient settings. Historically, it is estimated that 67 % of healthcare workers receive an influenza vaccine each year (6). For the first time, state law mandated that each inpatient facility have a policy to insure the attenuation of vaccine preventable disease. Hospitals attained near 100% compliance with the resulting policies; individuals who were unable to receive a vaccine due to medical reasons were required to wear masks when in patient care areas. Although a laudable intervention, the impact on community influenza rates when up to 75% of the general population remains unvaccinated remains to be proven.

A few lessons can be learned from our recent elephant encounter. First, although influenza vaccines are a vital part of our armamentarium, they are imperfect. Work continues on the development of a universal influenza vaccine that could be given once or twice with intermittent boosters, similar to a tetanus vaccination. It appears that there are segments of the influenza A hemagglutinin protein that, when inactivated or mutated, neutralize the virus. The availability of such a vaccine specific to these antigens would obviously increase the potential for achieving true "herd immunity" over time, protecting those most vulnerable patients who may not readily respond to a single vaccine. Even in the absence of herd immunity, the ability to build immune specificity to the target antigen with serial immunizations over time should greatly enhance the efficacy of the vaccine for the individual receiving it. Second, the unexpected impact of Influenza B during this outbreak highlights the difficulty in consistently predicting the predominant circulating influenza strains. Much work remains to be done to incorporate non-biologic factors (school schedules, ambient temperature, humidity, social activities) into the influenza prediction process. Finally, the deaths of adults and children secondary to influenza across the country reminds us that we still do not have the clinical tools and understanding to fully combat this disease. Current research at national and local levels attempts to improve the care of patients infected by influenza. Projects being performed locally include the use of influenza specific antibody infusions, combination anti-viral therapy for patients at high risk of complications from influenza, and the elucidation of effectiveness of oseltamivir for treatment in otherwise healthy patients. Although great progress is being made in understanding the disease, many questions remain.

Influenza comes each year, but likely the view next winter will still be from under the elephant.

References

1. April 1, 2013, 2012 - 2013 Texas Influenza Surveillance Information: *Texas Department of State Health Services*, http://www.dshs.state.tx.us/idcu/disease/influenza/surveillance/2013/ (April 02, 2013)

2. April 1, 2013, 2012-2013 Influenza Season Week 12 ending March 23, 2013. *FluView; A weekly Influenza Surveillance Report Prepared by the Influenza Division; CDC,* http://www.cdc.gov/flu/weekly/ (April 1, 2013)

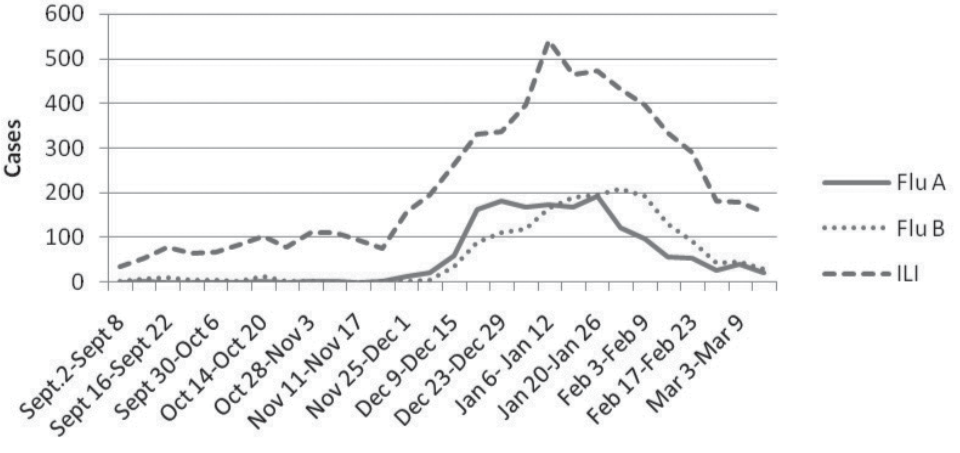
3. Moran A, et al, Assessing the influenza vaccination rates in Hispanic versus Non-Hispanic White elderly populations in West Texas, 2010, unpublished.

4. McElhaney JE, Influenza vaccine responses in older adults, Ageing Research Reviews, Volume 10/3, 2011, Pages 379–388.

5. Interim Adjusted Estimates of Seasonal Influenza Vaccine Effectiveness — United States, February 2013. Morbidity and Mortality Weekly Report, Feb 22, 2013 / 62(07);119-123.

6. Influenza Vaccination Coverage Among Health-Care Personnel — 2011–12 Influenza Season, United States. Morbidity and Mortality Weekly Report, Sep 28, 2012 / 61(38);753-757.

Fig. 1: Influenza Cases Reported Voluntarily to Amarillo Public Health Department 2012-13



Rh Incompatibility and Hemolytic Disease of the Newborn

Walter J. Bridges, M.D.

Geronimo Mendoza-Urias, M.D.

Abstract

Hemolytic disease of the newborn and fetus (HDN) is a destruction of the red blood cells (RBCs) of the fetus and neonate by antibodies produced by the mother. Rh incompatibility between a gravid woman and her fetus was a common event that in the past resulted in severe HDN with a very high mortality and morbidity rate. Ever since Rh0 (D) immune globulin (Rhogam) was introduced in 1966, the incidence of cases of HDN has dramatically decreases, to the point that nowadays it can be considered an infrequent pediatric problem. Here we describe a newborn with HDN secondary to Rh incompatibility and briefly review of the condition.

Case Report

A term large for gestational age (LGA) female infant was born via spontaneous vaginal delivery to a Caucasian woman who is O negative. Routine newborn screening showed that the infant was O positive and Coombs test was positive. Review of the mother's prenatal records showed that she was antibody negative and had received Rh immunoprophylaxis. Further testing showed that the mother's antibody was Immunoglobulin G (IgG) and was anti-D.

Bilirubin level was checked on the umbilical cord blood and was elevated at 5.2 mg/dL (normal range 0.4-2 mg/dL). The hemoglobin was 13.6 gm/dL (slightly low for age) and reticulocyte count was slightly elevated, demonstrating hemolysis. Phototherapy and intravenous fluid hydration was started and the bilirubin continued to increase to a peak of 19.2 mg/dL by day 5 of life (DOL). Then the bilirubin started to decline and phototherapy was discontinued. The hemoglobin declined to 8.6 gm/dL and the infant received a transfusion of packed red blood cells. The infant was stable during the hospital course and did not develop cardiac or respiratory problems. The patient was discharged on DOL 7 and continued to do well on follow up. At 6 weeks of age her bilirubin was in the normal range and her hemoglobin was slightly low but she didn't require further blood transfusion.

Hemolytic Disease of the Newborn

HDN, formerly known as hydrops fetalis or erythroblastosis fetalis, was initially described in 1609. The association of hydrops fetalis with anemia and jaundice was noted by Diamond and colleagues in 1932, and in 1940 Landsteiner and Weiner discovered the Rh (rhesus monkey) blood group system. Rh alloimmunization was found to be the most common cause of HDN, and in response Rh immunoprophylaxis with antiD IgG was started in 1966 in order to prevent sensitization of Rh negative women. With the introduction of the immunoprophylaxis with antiD IgG, the incidence of HND declined from approximately 45 cases per 10,000 live births to 10.2 cases per 10,000 live births.

The Rh blood group system is one of the multiple antigens on the surface of RBCs. It consists of more than 45 independent antigens, but for practical purposes we can describe it as complex composed by 5 main antigens, D, C, c, E and e. The letter "d" is used to indicate the absence of the D antigen (Rh negative). Out of the five, the D antigen is the most immunogenic and is the most common cause of HDN, followed by the c antigen. Rh negative persons lack the Rh antigen. The incidence in the population is whites 15%, Hispanics 8%, blacks 5% and Asians 1%. These individuals can potentially mount an antibody-mediated immune response after being exposed to as little as 0.1 ml of Rh(D)-positive blood. The most common form of exposure is fetal-maternal hemorrhage, which usually happens after an abortion, trauma during pregnancy, invasive obstetric procedure, or a normal delivery; it can also be the result of a blood transfusion.

The "foreign antigen", in this case Rh(D), is presented to the B-cells leading to the production of antibodies (immunoglobulins); of the different types of immunoglobulins, only IgG, specifically subclasses 1 and 3, can to cross the placental barrier. Once in the fetal circulation, the IgG attaches to the Rh(D) antigen on the fetal RBCs, followed by adherence of the coated RBCs to the Fc receptors of macrophages, extravascular phagocytosis and lysis (predominantly in the spleen). Hence, the severity of

| *continued on page 38*

the disease is mostly determined by the maternal IgG concentration, the efficiency of the IgG transplacental transport, the functional maturity of the fetal spleen, simultaneous ABO incompatibility, and other not fully understood factors.

In the absence of prophylaxis, Rh alloimmunization follows about 16% of initial pregnancies of Rh negative mothers. The frequency of alloimmunization decreases to about 2% if mother and infant are ABO incompatible. This is the result of the rapid destruction of the fetal RBCs by maternal anti-A and anti-B IgG, reducing the probability of exposure to Rh D antigenic sites. Once Rh alloimmunization occurs, however, ABO incompatibility will not decrease the secondary immune response in a subsequent pregnancy.

Most Rh sensitizations occur during the delivery of the first born infant with Rh(D)-positive blood. The first infant is usually not affected because the primary immune response is characterized by an initial production of IgM, which is not capable of crossing the placenta. The risk of HDN is therefore in subsequent pregnancies. In subsequent pregnancies, IgG1 antibodies cross the placenta earlier in the gestation and can cause anemia. If severe and not treated, the anemia usually leads to fetal congestive heart failure, hydrops and death. In contrast, IgG3 antibodies tend to cross the placental barrier at the end of the gestation, resulting in anemia and jaundice, which can potentially lead to kernicterus if not treated.

The mainstay of management of HDN is its prevention; determination of blood type and antibody screen is required in all pregnant females. For Rh(D)-negative women with an initially negative antibody screen and uncomplicated pregnancy, the antibody screen should be repeated at 28 weeks of gestation and at delivery. Rh immunoprophylaxis must be given at 28 weeks gestation and within 72 hours post-delivery, in order to prevent Rh alloimmunization. Immediately after delivery, a sample of the blood cord should be obtained for typing and direct coombs.

If during the pregnancy the antibody screen of the maternal blood comes back positive, the first step is to obtain maternal plasma in order to perform an indirect coombs. If positive, the next step is to determine the Rh(D) type of the fetus, first by testing the paternal blood, and if needed by using a reverse transcriptase PCR to detect cell free fetal DNA in the maternal circulation or by amniocentesis . Once it has been proven that the fetus is Rd (D) positive, if this is the first pregnancy complicated by alloimmunization, maternal anti-D titers must be followed. On the other hand, if there is a history of a previous affected pregnancy, the OB-GYN physician must monitor for fetal anemia with Doppler measurement of peak systolic velocity in the fetal middle cerebral artery, and if necessary, to confirm it by cordocentesis (obtaining blood from the fetal umbilical cord). Severe fetal anemia near term is treated by delivery for neonatal treatment; if remote from term, intrauterine fetal transfusions are performed.

In the newborn with positive direct

PANHANDLE HEALTH

A Publication of the Potter-Randall County Medical Society

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References References to scientific publications should be listed in numerical order at the end of the article with reference numbers placed in parentheses at appropriate points in text. The minimum acceptable data include:

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coombs, a cord bilirubin and hemoglobin (Hb) should be performed. Generally a good outcome can be expected when the Hb is >14 g/dL and cord bilirubin is < 4 mg/dL. Phototherapy remains the main treatment for hyperbilirubinemia due to HDN. Phototherapy consists of using light therapy to convert bilirubin to a more soluble form that is excreted in the urine. The infants' eyes need to be protected during phototherapy. IV hydration will improve urine output and increase bilirubin excretion. IV hydration also is required to account for increased fluid losses due to phototherapy. The total serum bilirubin (TSB) must be monitored at least daily and usually more frequently during phototherapy, in order to follow the rates of change of the TSB. Some randomized studies show that IVIG (1 g/kg at 12 hours of age) can reduce duration of phototherapy, hospital stay, and the need of exchange transfusion in patients with moderate-to-severe Rh disease. IVIG infusions will help "dilute" maternal antibodies and decrease hemolysis. The American Academy of Pediatrics has clear parameters and guidelines that determine when exchange transfusion is needed; this procedure should be performed in a neonatal intensive care unit with trained and experienced personnel. Emergent exchange transfusion is indicated in newborns with erythroblastosis fetalis, hydrops fetalis, or kernicterus. Currently exchange transfusion is rarely needed, and it is performed by changing out the infant's blood volume with compatible blood. Exchange transfusions reduce the mortality rate of severe HDN to about 25%. Prior to this therapy, the mortality rate of HDN approached 50%.

ABO incompatibility tends to cause mild HDN with little significant hemolysis. Mothers with A or B blood groups tend to have anti B or anti A respectively and the immunoglobulin tends to be IgM, which does not pass through the placenta into the fetus. However O blood group mothers tend to have anit A and anti B antibodies, which are more likely IgG which can cross the placenta. Babies with B blood type born to mothers with O blood type tend to have a higher incidence of HDN with slightly more hyperbilirubinemia. These infants usually require monitoring and phototherapy but rarely require exchange transfusions or IVIG.

Conclusion

Prior to the availability of prophylaxis and treatment, the mortality rate of HDN approached 50%, and many of the survivors had multiple complications including kernicterus, severe growth and development delay. This is a condition that we rarely see today, but it is of vital importance that all physicians involved in the management of pregnant women and newborns know the current guidelines in the prevention, diagnosis and management of Rh alloimmunization and hemolytic disease of the newborn.

References

1. Zimmerman D.R. Rh: The Intimate History of a Disease and its Conquest. New York, NY: MacMillan Publishing Company, May 1973.
2. Mintz PD. Rh Immune Globulin. In: Mintz PD, ed. Transfusion Therapy: Clinical Principles and Practice, 2nd Edition. Bethesda, MD: AABB Press; 2005.
3. Freda VJ, Gorman JG, Pollack W, et al. Prevention of Rh hemolytic disease-ten years' clinical experience with Rh immune globulin. N Engl J Med. 1975;292:1014-1016.
4. Prevention of Rh D Alloimmunization. ACOG Practice Bulletin. Number 4, May 1999. Clinical management guidelines for obstetrician-gynecologists. American College of Obstetricians and Gynecologists.
5. Has anti-D prophylaxis increased the rate of positive direct antiglobulin test results and can the direct antiglobulin test predict need for phototherapy in Rh/ABO incompatibility? Dillon A, Chaudhari T, Crispin P, Shadbolt B, Kent A J. Pediatr Child Health. 2011 Jan; 47(1-2):40-3. PubMed ID: 20973864
6. Non-invasive prenatal diagnosis and determination of fetal Rh status. van der Schoot CE, Hahn S, Chitty LS. Semin Fetal Neonatal Med. 2008 Apr; 13(2):63-8. PubMed ID: 18249590
7. Occurrence of anti-D in RhD-positive mothers and the outcome of the newborns. Filbey D, Berseus O, Carlberg M. Acta Obstet Gynecol Scand. 1996 Jul; 75(6):585-7. PubMed ID: 8693938
8. Guideline US Preventive Services Task Force. Screening for Rh(D) incompatibility: recommendation statement. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ), 2004.
9. The Rh blood group system: a review. Neil D, Avent Marion E. Reid. Blood January 15, 2000 vol. 95 no. 2 375-387
10. Peterec SM. Management of neonatal Rh disease. Clin Perinatol. Sep 1995;22(3):561-92.
11. Management of alloimmunization during pregnancy. 2006 Aug (reaffirmed 2010). NGC:005703 American College of Obstetricians and Gynecologists - Medical Specialty Society.

Marita Angleton Sheehan, M.D., M.P.H.

by E.F. Luckstead, M.D.

Dr. Marita Sheehan grew up in a military family environment. Her father was career U.S. Navy and thus she and her family moved frequently with multiple home experiences for Marita. She was born at Ft. Scott, Kansas but lived in several locations in the United States including Hawaii. Dr. Sheehan spent her college and early medical years in California, graduating from her pre-med years at University of San Diego College for Women and attending the University of California at San Francisco (UCSF) medical school, graduating in 1968. Her pediatric internship was at Los Angeles County, (USC Medical Center) and residency years were spent in the San Francisco area at Mt Zion Hospital and Medical Center. Dr. Sheehan received her MPH in Maternal and Child Health from the University of California School of Public Health at Berkeley, California from May 1971- 1972.

Eventually, Dr. Sheehan moved to the state of Texas where she spent her early academic pediatric years at Baylor College of Medicine in Houston (*1972-1975; 1980-1981*), intertwined with a private pediatric practice in Kailua, Hawaii (*1976-1979*) and Houston, Texas (*1980-1981*). Marita joined the pediatric faculty in Austin as their Pediatric Residency Program Director from 1986 to 1991 before moving to TTUHSC in Amarillo, as the Regional Pediatric Chairperson, from May 1992 to October 1994 and Pediatric Residency Director from May 1992 to November 1997. Dr. Sheehan has always been very active in the administrative role needs of the medical school. She also served as Interim Regional Dean from February to October in 1999 and was the Assistant Academic Dean for Students from 1994 to 2011. Dr. Sheehan's concern and advocacy for medical students is evident from her long term leadership as the TTUHSC-Amarillo GME Committee Chairperson.

While working in Massachusetts in 1982-1983, Marita met a young future lawyer, Tom Sheehan, who eventually became her spouse. Marita and Tom eventually adopted a 3-month old child, Christopher. This added a new dimension to her life. "*This has been the most fulfilling and exciting part of my life-watching and helping your child grow into an adult.*" Marita and Tom's son Christopher was a recent graduate of West Texas A & M!

Since the time Dr. Sheehan joined to the TTUHSC Amarillo medical environment in 1983, she has been very active in the medical school with her supportive roles that have positively affected many medical students and residents. (Regional Chairperson, Pediatric program director, Interim Dean, Assistant Dean of Students are just some of her roles!) Her subspecialty care expertise and interest in adolescent medicine and the challenges of sexuality, drug use and abuse from such youth has made her serve as a medical pillar to address these teenage medical needs in the Amarillo area the past 30 years. Dr. Sheehan worked diligently to improve these adolescent care challenge areas. However, the most memorable patient that Dr. Sheehan still recalls with "emotion" was a severely neglected infant whom she cared for as a pediatric resident. The infant was initially non-reactive emotionally. During the ensuing hospital ward time under Dr. Sheehan's care and with her interaction, the infant progressively began emotionally to react with excitement when seeing Dr. Sheehan, like a normal child does when provided "loving care." Dr. Sheehan states that she saw "true love" occur with that particular infant!

Dr. Sheehan has been a mentor and teacher for many students and residents that have become successful physicians both in Amarillo, Texas and throughout other parts of the United States. (One she cites is Dr. Steve Urban, one of her former students, who is also now actively teaching medical students and residents at the TTUHSC Amarillo medical school.)

"I had the pleasure of working with and being mentored by Marita for over 15 years before she retired from the Office of Medical Education. In her role as Assistant Dean, she impacted the lives of many residents and medical students. She took great care to nurture and encourage the development of humanistic physicians. She used her gentle, quiet strength to help them do the right thing and see the bigger picture. Marita instilled in them the great privilege it is to care for others and their loved ones." (Kristen Stutz- Assistant Dean of Students)

"I have known Dr. Marita Sheehan since 1982 when she joined the Department of Pediatrics at Texas Tech University Health Sciences Center – Amarillo Campus. She is a superb clinician and a great teacher of pediatrics. She has the finest clinical skills. According to my observations Marita has a very sharp diagnostic acumen. She is very compassionate towards her patients and, due to her vast clinical experience, she is very prompt in reaching an accurate clinical disposition. Her student and residents always tell me that Dr. Sheehan makes an accurate diagnosis after a very short interaction with her patients. She has a strong faith, which is a source of her inner strength and great sense of comfort even during difficult situations. Besides being a great and astute pediatrician, she is cloaked with humility; she has a peaceful smile and a non-judgmental demeanor. Marita is a rare example of a "real pediatrician" of the past several decades. I wish her many more years of clinical work and teaching." (M. Naqvi, M.D.)

PROFILES IN MEDICINE *(con't)*

"I guess the theme of my academic career is administration, patient care, student teaching. My bouncing between academics and private practice demonstrates my conflict between taking care of patients vs. teaching. To be able to do these two things together has been the best of things for me as far as medicine goes!" (Marita Sheehan M.D. March 2013).

I have known Dr. Sheehan as a personal friend, a valuable peer and faculty member in our pediatric department over the past 13 years. She definitely represents a valuable role physician model for all medical students, residents in pediatrics and especially those women physicians now serving Amarillo and the surrounding communities.

Concussion

What is concussion?
Concussion is a mild brain injury that is associated with confusion, headache, and memory loss. Passing out could take place. A concussion can happen after a person is hit on the head, face, or neck, or their head or upper body is shaken too hard. Car accidents, falls, and sports injuries like during football, soccer, and boxing are common causes of concussions.

How do I suspect concussion?
We suspect concussion when a head trauma is noted and the patient complains of headache, confusion, memory loss, or dizziness. Patients may also complain of nausea, vomiting, or lethargy. Delayed symptoms may take place like: trouble walking, talking, seeing, or sleeping. Kids may act cranky.

How to diagnose concussion?
When your doctor suspects concussion from the history and examination, s/he may order images of the brain. These include computed tomography (CT) which is an advanced X-ray that reveals pictures of slices of the brain or magnetic resonance imaging (MRI) which provides more details but uses magnetic waves.

What are the causes of concussion?
Concussion is caused by trauma to the brain. It could take place during sport activity, falls, motor vehicle accidents, and violent head and neck shaking.

Factors that increase risk of concussion
Preventing concussion is mainly a function of protecting the brain from injury. Back of the head support and seatbelts in carseats and helmet use during certain sporting activities are highly recommended. Rules of contact and engagement in certain sports can provide protection from blunt trauma.

How do doctors treat concussion?
There is no specific treatment for concussion. Most cases improve spontaneously over time. Some resolve within hours while in other cases, symptoms linger for months.

Observation by a family member or an acquaintance is recommended for several hours looking for the symptoms that are outlined above. The observer should awaken the patient up every few hours to make sure that he can actually wake up. If symptoms or poor level of consciousness are noticed, the doctor should be called.

How can I help my concussion heal well?
Get plenty of sleep and body rest. Avoid heavy physical or mental activity. Avoid drinking alcohol. You may use over the counter pain pills in the case of headaches. Resuming normal physical activity should be done only after the doctor approves it. Having another injury could cause longer lasting brain damage.

Reported by Tarek Naguib, MD, MBA, FACP

Based in part on Uptodate (patient information). http://www.uptodate.com/contents/concussion-the-basics?

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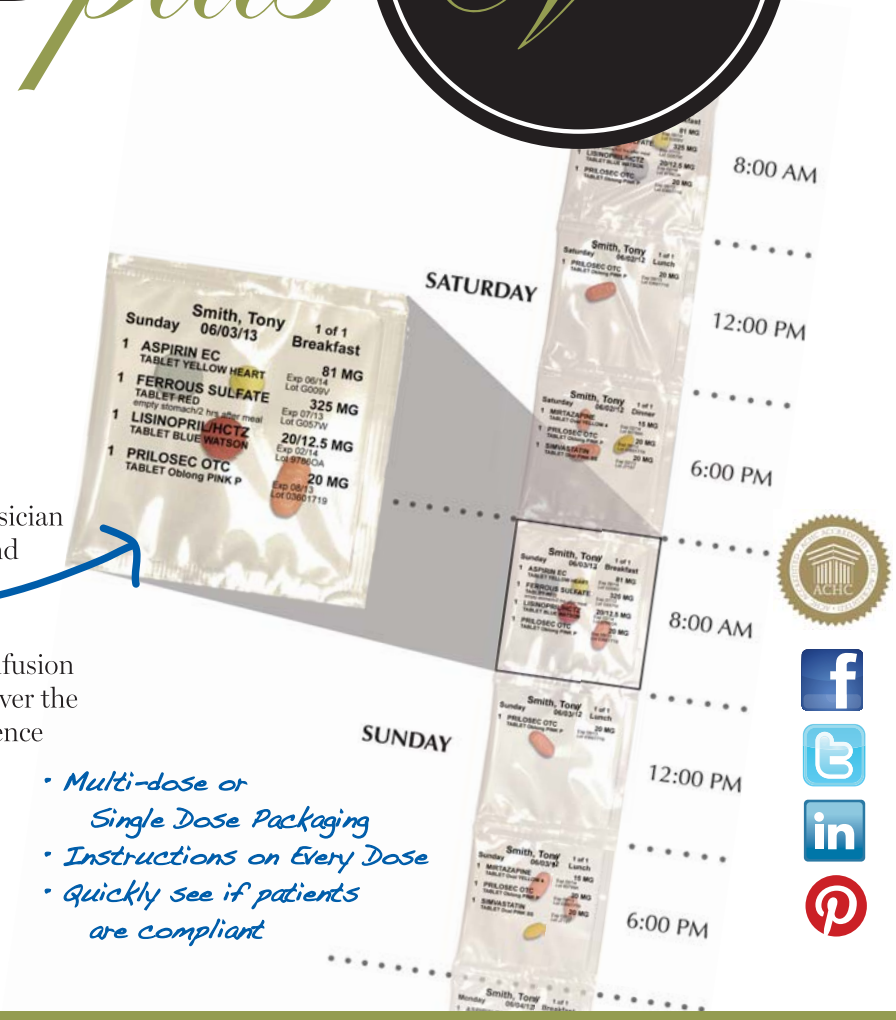

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CONVENIENT DRIVE-UP & DELIVERY

Combining Medicare Deductibles. The Wall Street Journal (4/5, A5, Radnofs) reports that a proposal to combine deductibles in Medicare Part A and Part B is gaining bipartisan support in Congress to control growth in Medicare spending. Such a change is expected to raise costs for most on Medicare, though it may reduce costs for those who have the largest medical bills.

Texas Senate Approves Medicaid Expansion. The Texas Tribune (3/26, Aaronson) reports, "The Texas Senate unanimously approved an overhaul of long-term and acute care Medicaid services on Monday in an effort to expand care to more Texans with disabilities while saving millions of state dollars." The legislation, Senate Bill 7, "is expected to save $8.5 million in Medicaid costs in the 2014-15 biennium by expanding managed care services, establishing pilot programs to try to provide services at capitated costs and implementing measures to ensure more efficient monitoring of services."

Texas House Reverses Medicaid Expansion. The AP (4/5) reports that Texas Republicans have "reversed themselves." This took place after the Texas House voted 93-54, along party lines, to reconsider the earlier vote regarding Medicaid eligibility expansion in relation to Federal healthcare reform laws.

Texas Can Reform Medicaid Without Expansion. The Texas Tribune (3/21, Aaronson) reports that the Texas Public Policy Foundation released a report to "Save Texas Medicaid: A Proposal for Fundamental Reform." The think tank suggests "the use of a block grant to let the state subsidize private health savings accounts, so that Medicaid recipients can pay for health services." The article notes that Arkansas has begun to reach compromises along these lines.

Arkansas To Buy Private Insurance. The Washington Post (3/19, Kliff) reports on the deal being worked out between HHS and Arkansas, in which the state would use Medicaid funding to buy private insurance for those between 100% and 133% of the poverty level. Now Florida, Ohio, Louisiana and Maine are considering the approach that could allow 2.4 million Americans to gain insurance coverage in these 4 states.

Pig Farm Waste. News@JAMA (3/27) reports that genes that confer resistance to all major classes of antibiotics were found in waste from large scale Chinese pig farms that use these antibiotics. This potentially-global public health problem is under study by the Chinese Academy of Sciences in partnership with Michigan State University scientists.

Resistant TB. JAMA (3/21) reports that after multidrug resistant (MDR) and extensive drug resistant (XDR) TB strains, South African scientists now report a totally drug resistant TB strain (TDR) which has been also reported from Italy, India, and Iran. The new strain resists all 10 anti-TB agents and may attract wide attention for obvious reasons.

Shorter Shifts Not Helping Medical Residents Improve Patient Safety. USA Today (3/25, Lloyd) reports on two studies appearing in the Journal of the American Medical Association, which found that the shorter shift has not improved young doctors' depression rates or how long they sleep. Most concerning: medical errors increased 15% to 20% among residents compared with those who worked longer shifts.

More Medical Students in Primary Care Residencies. USA Today (3/16, Lloyd) reported, "The number of medical students committing to primary care rather than specialties increased for the fourth straight year in the largest 'match program' in history.

Can Physics Explain Consciousness? The Brain Initiative Begins. White House Blog (4/2) announced that $100 million are allocated for brain mapping research. It is expected that research in new technologies will enable tracking nerve impulses of thought processes through the brain and help revolutionize the management of brain conditions like dementia, stoke, and injuries. As with genome mapping, brain mapping will mark a new era in personalized medicine. The cost to map the entire human genome for a person now is down to $7000.

USPSTF recommends against calcium! The US Protective Services Task Force recommends against the use of calcium supplements to prevent bone fractures. In 6 randomized studies, no benefits were found from 1000 mg of calcium with 400 IU of vitamin D3.

High Calcium Intake Linked to Death! Chelation Little Effect. JAMA (Lamas 3/27) reports that among 1708 patients with history of heart attack, intravenous chelation (using disodium EDTA to remove calcium) resulted in only a modest reduction of procedure rate (coronary stenting), not enough to consider the routine use of chelation for these patients. The blinded study extended over 8 years. This modest benefit may be in doubt as the authors suggest possible unblinding as an explanation for the higher drop-out rate of the patients in the placebo arm.

Reported by Tarek Naguib, MD, MBA, FACP

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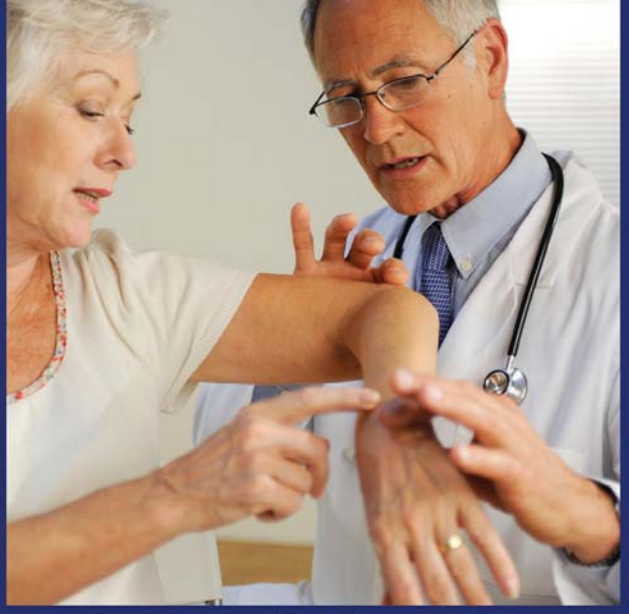


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