

BROUGHT TO YOU BY:  
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# Pediatric Residency Newsletter

## Maria Fareri Children's Hospital



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MARCH 2008

### Grand Rounds

March 5  
"Inhaled Steroids in  
Childhood Asthma—Facts  
and Myths"

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Interreligious  
Understanding  
Tanenbaum Foundation

March 19  
Shaken Infant Syndrome  
Drs. Altman and Canter

March 26  
Mood and Impulse  
Disorders  
Dr. C. Fink

### Resident As Teacher

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Nutrition  
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### Journal Club

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## Case 1: Paraspinal/Epidural Abscess by Dr. Rachel Lewis

SN is an 11 year old female who presented to MFCH with complaints of 5 days of back pain and 3 days of fever. She localized the pain to her right upper back and described it as radiating. She also had progressive difficulty walking attributed to "lack of feeling in her feet."

On physical exam, she was afebrile; examination of her back revealed no signs of trauma or breaks in the skin. Her neurological exam showed bilateral intact sensation and motor strength, but decreased proprioception in her lower extremities. She was non-ambulatory on arrival secondary to pain, and was noted to have diffuse hypersensitivity to touch. Her WBC count was 13 (increased to 18.3 the following morning) with 72% neutrophils, ESR 119, and CRP 27.9. MRI of her thoracic spine showed findings compatible with extensive right thoracic paraspinal abscess with dorsal epidural extension from T5 to T8 with associated severe spinal

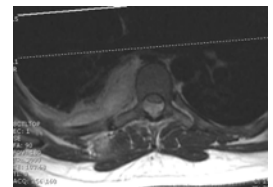
stenosis, cord compression and edema; it also showed edema of the right dorsal paraspinal musculature.

She was promptly taken to the OR for evacuation of her abscess. She was started on IV Vancomycin until cultures grew Methicillin-sensitive *Staph aureus* and she was switched to Nafcillin. At discharge, she continued to have some difficulty walking and was transferred to an acute rehabilitation facility to complete a 4-5 week course of IV antibiotics.

Spinal epidural abscess is most often caused by hematogenous spread of bacteria that seed the epidural space. Extension of bone or soft tissue infection, the likely cause in this case, is less common. Often the source of infection is never found. *Staph aureus* is the most commonly isolated pathogen; others include *Pseudomonas*, *E. coli*, and *Mycobacterium*. The location is usually the posterior epidural space, as it is large and filled with arteries, veins, and fat, while the anterior

space is more of a potential space. Most abscesses occur in the thoracic region, although it can easily spread throughout many levels.

The clinical presentation can include fever, back pain (radiating or localized), and neurological deficits, or any combination. When the dorsal column-medial lemniscus tract of the spinal cord sensory deficits including touch/proprioception/vibration may be noted. The neurologic symptoms, caused by spinal cord compression and compromise of the spinal arteries and veins, can begin as weakness and sensory loss and progress to paralysis and death if not treated.



## Case 2: Orbital Cellulitis by Dr. Kristen Woodard

AR is an 11 year old male with a 2 day history of right eye pain and subsequent periorbital swelling and erythema. Patient had no history of fever, foreign body, or trauma. The patient had a history of frequent sinus infections and *Strep* pharyngitis and was receiving cefdinir for *Strep* pharyngitis diagnosed by rapid *Strep* test. Physical exam revealed erythema and edema of the right upper eyelid, right sided proptosis with decreased ocular motion. The conjunctiva was clear and pupils were equal, round, and reactive to light. Visual acuity was 20/20 OU. Patient was also noted to have bilateral tonsillar exudates and tender anterior cervical lymphadenopathy. On the day of admission the patient had noticed worsening swelling and pain. CT revealed orbital cellulitis as well as ethmoid sinusitis on the right and the patient was referred to MFCH for further care and evaluation. Patient was admitted to MFCH and started on intravenous ampicillin/sulbactam. Condition rapidly improved on IV antibiotics and patient was discharged home on amoxicillin/clavulanate.

Orbital cellulitis almost always arises from the contiguous spread of a sinus infection (ethmoid in 75-90% of cases). The walls of three sinuses make up portions of the orbital wall. Infection can breach these walls or may spread by way of the anastomosing venous system. Patients may manifest signs of periorbital infection (lid edema, erythema, swelling, fever) as well as proptosis, restricted

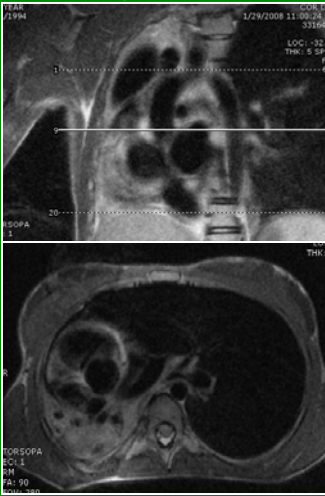
eye movement, and pain with eye movement. CT or MRI is required to establish the extent of disease as well as evaluate for sinusitis or intracranial complications. Treatment includes systemic antibiotics to cover for respiratory flora (*S. pneumoniae*, nontypable *H. influenzae*, *S. aureus*, and *Moraxella catarrhalis*) as well as anaerobes, with or without surgical drainage. Surgery to decompress the orbit and open infected sinuses is indicated if vision is compromised, suppuration or foreign body is suspected, CT demonstrates orbital or large subperiosteal abscess, or lack of response to antibiotics. Complications include vision loss from ischemic retinopathy, optic neuropathy caused by increased intraorbital pressure; restricted ocular movement; and intracranial sequelae, including cavernous sinus thrombosis, meningitis, and cerebral abscess.



## Picture of the Month: Dextroposition by Dr. Pascal Saremsky

**Dextrocardia**—true anatomic reversal ; cardiac apex points right

**Dextroposition**—heart displaced to right; no anatomic alteration in heart itself, just location.



TL is a 13 year-old female with a history of hypoplastic right lung, bronchiectasis, and dextroposition, admitted to MFCH PICU with a one-day history of cough and hemoptysis without fever. She had multiple admissions at a city hospital this year for treatment of pneumonia with similar presentations. Her past medical history is otherwise non-contributory; she has tested negative for cystic fibrosis. TL was adopted; family and birth history are unavailable other than that she a ex-28 week premie. On admission her physical exam was remarkable only for normal but dextraposed heart sounds. She also had an elevated WBC count. CT scan done without contrast (due to allergy) showed extensive right lung bronchiectasis and consolidation consistent with pneumonia. V/Q scan demonstrated less than 10% perfusion to the right lung. Her condition improved rapidly on antibiotics. Due to the multiple admissions for pneumonia, a decision was made to perform a right pneumonectomy after several weeks of outpatient antibiotic treatment. The cardiac MRI (seen left) shows complete dextroposition of the heart, with a normal cardiac size. There is no septal hypertrophy. The arch of the aorta is here visible and lies to the left of the trachea. The left lung has compensatory hyperexpansion. The MRI was requested in preparation for the

pneumonectomy to identify any aberrant vessels. Specifically, scimitar syndrome is a rare congenital defect associated with dextroposition of the heart, right lung hypoplasia, and PAPVR. In this syndrome with an incidence of 1-3 in 100,000, an anomalous vein connects the pulmonary venous to the systemic venous circulation at the inferior vena cava, creating a left-to-right shunt. The condition is named after the curved sword (i.e., scimitar) pattern left by the aberrant vessel on CXR.

Although TL did have cardiac dextroposition and right lung hypoplasia, she was not found to have scimitar syndrome or other anomalous pulmonary vessels. Her dextroposition is isolated and therefore termed *situs solitus*: all other viscera are in their correct position. If, in addition, the heart were also in a mirror image (e.g., the left ventricle was located to the right of the now left-sided right ventricle), then the condition is known as *dextrocardia situs inversus*. And if all other viscera are mirrored, then we have *dextrocardia situs inversus totalis*. Finally, a well known association with dextrocardia situs inversus totalis is *Kartagener Syndrome*, an autosomal recessive disorder due to dysfunctional ciliary motility that occurs in approximately 1 in 32,000 live births. The clinical triad is situs inversus, chronic sinusitis, and



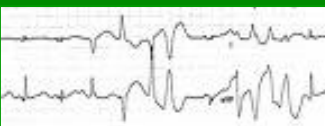
Advocacy Corner  
by Dr. Emily Koelsch

This month I will review the health care proposals of the current 3 main candidates in the 2008 presidential election. For more information please visit the Kaiser Family Foundation at [www.health08.org](http://www.health08.org). Hillary Clinton is affiliated with the Democratic Party; the goal of her health care plan is to provide affordable and high-quality universal coverage through a mix of private and public insurance. Senator Clinton would require all Americans to have health care coverage with income-related tax subsidies to make it affordable. The value of the tax credit would ensure that premiums not exceed a fixed percentage of family income. Citizens would choose from plans operated through the FEHBP (Federal Employee Health Benefit Program) or stay with employer coverage or public programs (Medicaid, SCHIP) which would be strengthened. FEHBP plans (those offered to members of Congress) would be considered the benchmark and include mental and dental health coverage. Senator Clinton has a 7 step strategy to reduce health costs: 1) a national prevention initiative; 2) paperless health information systems; 3) chronic care coordination; 4) elimination of insurance discrimination to reduce administrative costs; 5) a "Best Practices Institute" to help consumers make care choices; 6) a "smart purchasing" initiative to improve prescription drug and managed care costs; 7) linking medical error disclosure with physician liability protection.

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### Bazett's Equation

$$QT_c = QT / \sqrt{RR}$$



## Inside the ICU: Long QT Syndrome (LQTS) by Dr. Angela Lumba

GD is a 15 y otherwise healthy adolescent girl who presented with an acute history of pulseless arrest after seizure-like activity. One day prior to admission, she experienced a syncopal episode at rest with associated LOC and persistent headache (HA) with nausea and vomiting (N/V). On the date of admission N/V resolved, however, HA and fatigue continued with associated photophobia. She collapsed while walking with generalized tremors, eye rolling, and LOC, followed by complete loss of tone and cessation of respiration. CPR was initiated by a family member. Subsequent EMS AED showed ventricular fibrillation with defibrillation x 2 in the field. Pt transported to outside hospital where she developed a generalized tonic-clonic seizure in ED requiring lorazepam, phenobarbital, and phenytoin load. She was intubated emergently, head CT obtained (WNL) and LP performed prior to transport to MFCH ED. At MFCH ED, patient developed pulseless ventricular tachycardia with return to sinus rhythm following lidocaine and Mg sulfate. Patient had neg Utox and blood acetaminophen/salicylate/ETOH levels, CMP was WNL and CSF was normal. EKG demonstrated a QTc of 0.67 (far above the norm). In accordance with current guidelines, beta blockade was started. An AICD

(Automatic Implantable Cardioverter Defibrillator) was then implanted.

The QT interval on the ECG represents the time for depolarization and repolarization of the ventricular myocardium. In LQTS, there is a defect in ion flow during the cardiac cell's action potential causing prolonged repolarization. Measurement of a QT interval is corrected for heart rate using Bazett's equation (see left). Generally a long  $QT_c$  is 0.44 sec or greater, however, norms vary with sex and age.

LQTS patients are at significant risk for Torsades de Pointes and ventricular fibrillation, which can clinically manifest as syncope or sudden death. Such life-threatening clinical scenarios are often the initial presentation of this syndrome. Management requires correction of electrolyte abnormalities (esp. K+), beta blockers, AICD placement, and surgery for severe cases. Preventative measures in patients with long QT include avoiding drugs that can prolong the QT interval, notably quinidine, procainamide, sotalol, many antidepressants, and some antibiotics like erythromycin. They should also avoid strenuous exercise and stress. As LQTS is often inherited, family members should be screened as well.

**What is "fifth disease?"** Fifth disease, also known as erythema infectiosum, is caused by Parvovirus B19, a member of the *Erythrovirus* genus of the Parvoviridae family. The ill child typically has a "slapped-cheek" rash on the face and a lacy erythematous rash on the trunk and limbs, which is occasionally pruritic. A prodrome may include a few days of low-grade fever, malaise, or URI symptoms. The child is usually not very ill, and the rash resolves in 7 to 10 days.

**Is fifth disease contagious?** Yes. Parvovirus B19 has been found in the respiratory secretions (e.g., saliva, sputum, nasal mucus) of infected persons prior to the onset of rash. The virus is spread from person to person by direct contact with those secretions. By the time a child has the characteristic rash he or she is probably no longer contagious and may return to school or daycare. According to the *Red Book*, droplet precautions are recommended for hospitalized children with aplastic crises, those with papulopurpuric gloves-and-socks syndrome, and immunosuppressed patients with chronic infection and anemia, for the duration of hospitalization. For patients with transient aplastic crisis, these precautions should be maintained for 7 days. Pregnant women exposed to Fifth disease should consult their Obstetrician regarding the need to determine their serological status and whether ultrasonography is indicated.

**How soon after infection with Parvovirus B19 does a person become ill?** The incubation period is approximately 4 to 14 days, but may be as long as 20 days after infection. During outbreaks of fifth disease, about 20% of adults and children who are infected with Parvovirus B19 are asymptomatic, and additional persons have a non-specific illness that is not characteristic of fifth disease. Persons infected with the virus, however, do develop lasting immunity that protects them against future infection.

**How is fifth disease diagnosed?** Fifth disease is usually a clinical diagnosis which does NOT require serologic

confirmation. However, in the immunocompetent host the preferred diagnostic test is detection of serum parvovirus B19-specific immunoglobulin (Ig) M antibody by radioimmunoassay or enzyme immunoassay. A positive IgM test indicates infection within the previous 2 to 4 months. IgM antibody may be detected in up to 90% of patients at the time of the rash and by the third day of illness in patients with transient aplastic crisis. Serum IgG antibody appears by about day 7 and persists for life. Chronic infection in the immunocompromised patient is diagnosed by detection of the virus by nucleic acid hybridization or polymerase chain reaction (PCR) assays. Parvovirus B19 DNA detectable by PCR persists in serum at low levels for up to 9 months.

**Can fifth disease be serious?** Fifth disease is usually a mild illness that is self-limited among otherwise healthy children and adults. "Joint symptoms" including arthritis/arthropathy, which are more common in older children, adolescents and adults, usually resolve without long-term disability. Parvovirus B19 infection may cause a serious illness in persons with sickle-cell disease or similar types of chronic anemia, as well as in immunocompromised patients. In such persons, Parvovirus B19 can cause aplastic or erythrocyte crisis. Interestingly, the typical rash of fifth disease is rarely seen in these persons. Once the infection is controlled, the anemia resolves.

**How are parvovirus B19 infections treated?** Treatment is usually only symptomatic (fever, pain, itching). Persons with severe anemia may need to be hospitalized and receive blood transfusions. Immunocompromised patients may need additional care, including treatment with IVIG.

**Can parvovirus B19 infection be prevented?** There is no vaccine or medicine that prevents parvovirus B19 infection. Frequent handwashing is recommended. Excluding infected persons from work or school is unlikely to prevent spread, since people are contagious before they develop the rash.

**DIRECTOR'S CORNER:  
DR. THERESA HETZLER**

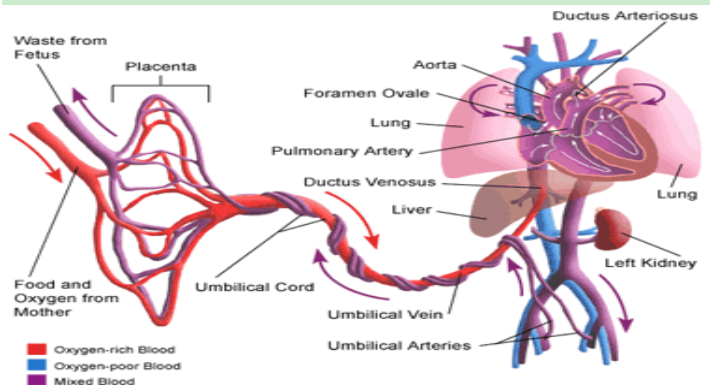
It's March, and at least 15 people are reading this column while they count down to graduation, new job/fellowship and the Boards. Even the most confident senior residents start to get a bit nervous in the last few months of residency. Will I know enough when I start in my practice? Will I pass the Boards? How can I cram all the reading I should have done in the past 32 months into the next 4? Another 22 are contemplating their increased senior responsibilities which with start in 4 months. It's the same every year. Though I can't read *Nelson's* to you while you sleep, I can give you some advice. Our program prides itself on the diversity of patient diagnoses, drawing patients from the 7 counties of the lower Hudson Valley. The plethora of diagnoses, associated differentials, pathophysiology and evaluation plans presented to us by our diverse patient base are discussed at Morning Report. With few exceptions, all non-ICU seniors (PL2's and PL3's) should be participating in this excellent educational activity. I personally found that Morning Report played a big part in preparing me for my recertification exam.

Over the years, Morning Report has taken on various formats, targeted different audiences and focused on different educational goals. New ideas are always welcome. Presently, the learning atmosphere is quite relaxed and faculty members are raising the resident knowledge bar. So don't just think of this as a rehashing of the new admissions for the floor teams. Bring your coffee, soak up some knowledge and share your thoughts with your peers. For some the discussions will serve as a review and for others, it will bring up subjects requiring further investigation. In either case a great way to start your day.

See you at 8a.m. *Terry Hetzler, MCD*

**Back to the Basics: Fetal Circulation**  
By Dr. Kristen Woodard and Dr. Lauren Mendelsohn

Oxygen-rich blood from the placenta travels via the umbilical vein to the liver where 50% will flow through capillary beds in the liver and 50% will be diverted to the ductus venosus. The ductus venosus drains to the IVC and mixes with oxygen-poor blood from the lower extremities. This blood is therefore "medium" in its oxygen content. It travels to the R side of the heart where the majority is diverted from the lungs (via the patent foramen ovale.) It then travels to the L side of the heart and is pumped to the aorta. Oxygen-poor blood from the SVC mixes with some of the remaining mixed IVC blood and goes via the RA to the RV to the PA. 90% of this blood enters the ductus arteriosus and is shunted to the aorta, while 10% goes to the lungs and back to the LA via the pulmonary veins. All blood in the aorta ultimately returns to the placenta via the umbilical arteries. Remember, there are 2 umbilical arteries and one umbilical vein.



**Advocacy Corner**  
by Dr. Emily Koelsch  
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Barack Obama is affiliated with the Democratic Party; the stated goal of his health care plan is to provide affordable and high-quality universal coverage through a mix of private and expanded public insurance. Senator Obama would require all children to have health coverage, and employers to offer benefits or contribute to the cost of a new public plan. He would create a National Health Insurance Exchange where small businesses or individuals who don't qualify for public assistance could enroll in a new public plan or an approved private plan. Senator Obama's new public plan would offer benefits similar to those available through FEHBP. Individuals would be given income-related subsidies to purchase insurance; employers would be given federal subsidies to partially reimburse catastrophic health care costs if used to decrease premiums. Senator Obama's cost containment strategies include: 1) investing in electronic medical records and health information technology; 2) promoting insurer competition through the National Health Insurance Exchange; 3) stressing preventative medicine, public health initiatives and improving chronic care management; 4) promoting generic drugs, allowing reimportation of medications, allowing price negotiation between Medicare and drug companies; 5) reforming medical malpractice and strengthening antitrust laws, promoting new models for addressing physician errors.

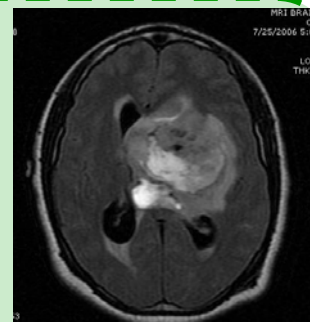
John McCain is affiliated with the Republican Party; the goal of his health care plan is to provide access to affordable health care for all by paying for quality health care, having insurance choices that are diverse and responsive to individual needs and encourage personal responsibility. To accomplish this he plans to expand access and coverage by providing tax credit to individuals (\$2500) and families (\$5000) for purchasing insurance. Senator McCain would allow veterans to use their VA benefits to pay for care by providers in their chosen location. Cost containment is proposed through payment to change providers, tort reform, and investment in prevention/care of chronic illnesses. He would also require drug companies to reveal the price of drugs, allow re-importation of drugs and encourage faster introduction of generics and biologics. Senator McCain also wants to promote competition and reduce overhead costs of private insurance by selling nationwide insurance.

**Case Study: Glioblastoma Multiforme**  
by Dr. Sarah Washington

RM is a 19 year old African American male who was diagnosed with glioblastoma multiforme (GBM) in July 2006 after presenting with right hemiplegia, diplopia and a 6 week history of headache. He was diagnosed at Albany Medical Center after a needle biopsy and was transferred to MFCH. He underwent a left craniotomy and resection and had a VP shunt placed. RM completed 6 cycles of temozolomide and lomustine (CCNU). He underwent high-dose thiotepa and carboplatin with tandem autologous peripheral blood stem cell transplantation on 9/25/07, which caused 25-30% tumor shrinkage. RM returned for another treatment on 12/7/07.

GBM is the most common and aggressive of the primary brain tumors, accounting for 52% of all primary brain tumor cases and 20% of all intracranial tumors. It is an anaplastic tumor with nuclear atypia and microscopic necrosis. Primary GBM accounts for 60% of cases in adults >50 years. Secondary GBM (40%) typically develops in younger patients through malignant progression from a low-grade (grade II) or anaplastic astrocytoma (grade III). The average time for disease progression is 4-5 years.

Signs and symptoms of GBM include focal neurological deficits,



headaches, seizures, and mental status changes. Metastasis to the spinal cord or outside the nervous system is rare.

MRI is radiologic study of choice. Biopsy is the diagnostic gold standard. Treatment involves chemotherapy, radiotherapy, and surgery, but none are curative. The median survival is 0.7 years. Histological grading, age at diagnosis, and the Lansky Play scale are the main prognostic factors. The Lansky Play Scale measures physical activity on a percentage scale from 0 to 100%. 0% is dead and 100% is full physical activity. Long-term survivors are those who survive >2 years, which is rare.

**Quote of the Month:** "They thought it was Cocoon meningitis" — Answer given by patient grandmother when questioned on reason for Lumbar Puncture.

**Announcements:**

Remember Match Day is Thursday, March 20th. There will be a post-match lunch for residents and interviewing staff.

Congratulations to Dr. Maria Lombardi on the birth of her baby girl, Sophia Elena Lombardi, born February 17, 2008.

Congratulations to the 3rd year class for crossing the 100 days till graduation mark on March 17th, 2008, St. Patrick's Day.

Congratulations to the residents on substantial compliance with 405 Duty/Work Hours.

**Puzzle of the Month: Cryptoquote by Dr. Pamela Gonzalez**

P FECMB ETFBCMR CU WYLSTSTY  
 2000 X.S. - "EYMY, YPB BETF MCCB."  
 1000 X.S. - "BEPB MCCB TF EYPBEYI, FPR BETF VMPRYM."  
 1850 P.L. - "BEPB VMPRYM TF FGVYMFBTBTCTI, LMTIH BETF VCBTCTI."  
 1940 P.L. - "BEPB VCBTCTI TF FIPHY CTO, FAPOCA BETF VTOO."  
 1985 P.L. - "BEPB VTOO TF TIYUUSBTZY BPHY BETF PIBTCTCBTS."  
 2000 P.L. - "BEPB PIBTCTCBTS TF PMBTUTSTPO. EYMY, YPB BETF MCCB."  
 - PGBECM GIHICAI

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"YAO XKGYKJ PVU VSWK SOVJQ PKJO VHKB YAO FSSQOWW  
 "DJKP YAO CVU YAO EVYFOQY YOSSW YAO WYKJU  
 "YAVQ DJKP YAO WYKJU FYWOSD."  
 - NVPOW H. AOJJFGZ

#1

#2

1. Cystinosis, 2. End-Stage Renal Disease, 3. Minimal Change NS, 4. Acute Renal Failure, 5. Prenatal Hydronephrosis, 6. Posterior Urethral Valves, 7. Hyponatremia, 8. Postinfectious Glomerulonephritis

ANSWERS TO BE PUBLISHED WITH APRIL 2008