Trinity School of Medicine

St. Vincent and the Grenadines

TRINITY SCHOOL OF MEDICINE

May 2012

Issue 2 – Welcome Back!

Inside

Medical World

Pulse Oximetry Yields High Specificity in Detecting Congenital Heart Defects CME

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CME Author: Charles P. Vega, MD

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Congenital heart defects account for up to 40% of all deaths from congenital defects among infants. The newborn physical examination is the cornerstone of screening for congenital heart defects, but a previous study by Wren and colleagues, which was published in the January 1999 issue of the *Archives of Disease in Childhood*, demonstrated that the physical examination can be unreliable in the detection of congenital heart defects. The study was limited to infants with congenital heart disease. Only 45% of these infants were identified on routine physical

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Trinity School of Medicine

Trinity Residency News!

Trinity School of Medicine announces results of the 2012 National Residency Match Program (NRMP) and 2012 Canadian Resident Matching Service (CaRMS).

According to the ECFMG, the organization that certifies International Medical Graduates (IMGs) to enter US graduate medical education, for the tenth consecutive year, the number of first-year residency positions offered through the National Resident Matching Program (NRMP) increased. The number of IMGs who matched to first-year residency positions in 2012 increased by 260 from the previous year. Of the 11,134 IMGs who participated in the 2012 Match, 4,886 (43.9%) matched.

Small Class, Big Results

When Trinity welcomed our charter class in the Fall of 2008 thoughts of residency matches were still a distant goal, though one that the faculty, administration and new class were focused on from day one. Eight of the twelve students who

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Test Yourself:

Questions from First Aid Q&A USMLE STEP 1

Le, Tao, and Seth Bechis. *First Aid Q&A USMLE Step 1 2011*. 2ndnd ed. New York: McGraw Hill, 2009.

1. An 8-month-old boy is brought to the pediatrician by his parents because he has recently lost the ability to crawl or hold his toys. On examination the patient is tachypneic and breathing with considerable effort; the liver is palpable five-finger widths below the right costal margin. X-ray of the chest reveals cardiomegaly. He has a difficult time sitting upright and cannot squeeze the physician's fingers or the ring of his pacifier with any noticeable force. Despite a number of interventions, the child's symptoms continue to worsen until his death 2 weeks later. On autopsy, it is likely that this patient's cells will contain an accumulation of which of the following substances?

(A) Glucose
(B) Glycogen
(C) Oxaloacetate
(D) Pyruvate
(E) Urea

2. Endocrine
A certain endocrine disorder can lead to an elevated blood pressure, decreased potassium levels, sodium and water retention, and decreased renin activity. Which of the following is the most likely diagnosis?

(A) Addison's disease
(B) Hyperthyroidism
(C) Pheochromocytoma
(D) Primary hyperaldosteronism
(E) Secondary hyperaldosteronism

3. Pharmacology
A 56-year-old male stabbing victim has been in the hospital for 4 days with an infected wound that presented with crepitus and exquisite tenderness on palpation. Following tissue d.bridement and the initiation of intravenous antibiotics, the wound has started to heal, but on hospital day 5, the patient develops a fever, an increased WBC count, and watery diarrhea. The patient's new symptoms most likely resulted from the use of which of the following therapeutic agents?

(A) Amantadine
(B) Clindamycin
(C) Metronidazole
(D) Tetracycline
(E) Vancomycin

Answers on next page

Answers to Test Yourself

1.Biochemistry
The correct answer is B.

This patient has Pompe's disease, a glycogen storage disorder. Pompe's disease is an autosomal recessive disease that is characterized by a deficiency or defect in lysosomal **α**-1,4-glucosidase. This enzyme is necessary for the dissolution of the polymer linkages in glycogen. In its absence, glycogen accumulates to toxic levels in both the cytoplasm and lysosomes.

Answer A is incorrect. Glucose is stored as glycogen in the cells and is also present in blood. However, hyperglycemia is not responsible for the symptoms observed in this patient.

Answer C is incorrect. Oxaloacetate is the first intermediate in the Krebs cycle. It is regenerated with each turn of the cycle but is not present in excessive amounts in the cell.

Answer D is incorrect. Pyruvate is a component of the cellular respiration pathway and an intermediate in gluconeogenesis. It is not stored in cells in any significant quantity.

Answer E is incorrect. Disorders of the urea cycle leading to nitrogen accumulation in the body can result in progressive lethargy and coma but generally do not

2. Endocrine
The correct answer is D.

Primary hyperaldosteronism is most commonly caused by an aldosterone-producing adenoma of the adrenal gland. It can also be found in patients with zona glomerulosa hyperplasia. The increased levels of aldosterone lead to hypertension, increased sodium and water retention, and the associated increase in excretion of potassium leading to hypokalemia. Increased blood pressure and aldosterone levels produce negative feedback to the kidneys, resulting in a decreased level of serum renin. Serum renin levels help differentiate between primary hyperaldosteronism, with increased aldosterone and decreased renin levels, and secondary hyperaldosteronism, with increased aldosterone levels and increased renin levels.

Answer A is incorrect. Addison's disease results from adrenal atrophy and causes hypo-function of the adrenal glands. Patients with Addison's disease display signs that are the opposite of those seen in hyperaldosteronism, including hypotension, hyponatremia, and hyperkalemia.

Answer B is incorrect. Patients with hyperthyroidism have heat intolerance, hyperactivity, weight loss, chest pain/palpitations, arrhythmias, diarrhea, hypereflexia, fine hair, and warm, moist skin.

Answer C is incorrect. Patients with pheochromocytoma have increased levels of epinephrine and norepinephrine, which can lead to elevated blood pressure; however, sodium, potassium, and renin levels are not affected.

Answer E is incorrect. Lab values in secondary hyperaldosteronism would show hypernatremia and hypokalemia with an increase in renin levels. Secondary hyperaldosteronism occurs in settings in which the kidneys perceive low intravascular volume (renal artery stenosis, chronic renal failure, chronic heart failure, cirrhosis), resulting in an overactive renin- angiotensin system that acts as a stimulus for aldosterone secretion.

3. Pharmacology
The correct answer is B. The finding of crepitus suggests that the patient initially had a wound infection from a gas-producing anaerobic organism, most likely Clostridium perfringens, which responds well to clindamycin. Unfortunately, one of the adverse effects of clindamycin is superinfection (ie., an infection on top of another infection) caused by destruction of the colon's normal flora and allowing an overgrowth of Clostridium diffi cile, which is resistant to clindamycin. C. difficile causes pseudomembranous colitis, one of the most common nosocomial infections. Endoscopy reveals areas of colonic mucosa covered by a "membrane" of necrotic tissue produced by C. difficile exotoxin. Though the danger of pseudomembranous colitis exists with the use of any antibiotic, the risk is substantially higher with clindamycin, penicillins, and cephalosporins.

Answer A is incorrect. Amantadine is an antiviral agent associated with ataxia, dizziness, and slurred speech.
Answer C is incorrect. Metronidazole is associated with a disulfi ram-like reaction with alcohol. It is frequently used to treat pseudomembranous colitis.
Answer D is incorrect. Tetracycline is associated with tooth discoloration in children.
Answer E is incorrect. Vancomycin is associated with "red man" syndrome when given rapidly through an intravenous line. Given orally, it can be used to treat pseudomembranous colitis.

examination, and 34.9% of newborns found to have normal results during the newborn examination presented with congenital heart disease or died before age 6 weeks.

Pulse oximetry might represent a simple means to improve screening for congenital heart defects, and the current systematic review and meta-analysis by Thangaratinam and colleagues examines the efficacy of this test.

A new meta-analysis with data from almost 230 000 newborns shows that pulse oximetry is highly specific for detection of critical congenital heart defects [1]. The results provide "compelling evidence" for its use as a screening test for congenital heart defects in clinical practice, the authors say.

The meta-analysis, published online in the *Lancet* on May 1, 2012, was conducted by a team led by **Dr Shakila Thangaratinam**(Queen Mary University of London, UK).

Thangaratinam commented to **heart*wire*** : "We looked at all the studies in this field and collected all the evidence that summarized the accuracy of pulse oximetry. This means that we were able to provide the most precise estimates to date."

They found the test to have a sensitivity of 76% in detecting critical congenital heart abnormalities. "This is a large increase in the current detection rate of about 50% from clinical examination and antenatal scans," Thangaratinam said.

Low False-Positive Rate "We also found a very low false-positive rate--just 0.14%. That is about one in 1000. This is very reassuring. So there are many reasons now to recommend this test become part of routine screening of newborns. It is very simple, takes only a few minutes, improves the detection of cardiac problems, and has a very low false-positive rate."

Thangaratinam reported that congenital heart disease affects about seven to eight per 1000 babies, and critical congenital heart defects--in which babies die or need major surgery in the first month of life--occurs in around one to 1.8 per 1000 newborns.

Studies have suggested that a combination of pulse oximetry and clinical examination would pick up an additional 30 cases of critical cardiac defects for every 100 000 babies born, she added. "With early detection, surgery can be performed sooner, before the baby collapses, which is associated with much better outcomes. With early surgery, many of these babies are living well into their teens."

As the current study was so large, the researchers had the opportunity to look at results of the test at different time points. 'We looked at the difference between doing it in the first 24 hours after birth or after 24 hours, and there was not much difference in sensitivity, but there was a higher false-positive rate before 24 hours [0.5% vs 0.05%]," Thangaratinam said. Despite this and because of the fact that many babies leave the hospital before 24 hours, she still believes the test should be done in the hospital before the baby is sent home, for logistical reasons.

Challenge Is Ensuring Echo Is Done Quickly

Lead author of an associated editorial [2], **Dr Alex Kemper** (Duke University, Durham, NC) agrees. He commented to **heart*wire***: "Identifying congenital heart defects is a challenge, as these babies can look like every other baby in the nursery. But we need to identify them as early as possible, as we can really improve outcomes."

Kemper said the difficulty was ensuring that the diagnostic echocardiography follow-up was done. "Many centers don't have onsite pediatric echo. Those babies might have to be transferred to a larger center, or the images could be sent by telemetry to a specialist. Babies with heart defects often get into trouble when the patent ductus arteriosus closes (at day 2 to 3), so it is important that the echo is read before the baby leaves the hospital."

The US is the only country so far to adopt the test, where it has been recommended by the **US Department of Health and Human Services Secretary**, and six states have now made the test mandatory. Many larger hospitals in other states have also decided to do it. Kemper said that smaller hospitals may wait until there is a strategy in place for the echo to be read. He added that the pulse-oximetry test results may be different in centers at high altitude and these centers may need to conduct additional studies to identify an adjusted threshold for a positive result.

References on Website:
http://www.medscape.org/viewarticle/763373?src=cmemp

participated in the 2012 NRMP Main Match obtained a first-year residency position. To have achieved such strong results so early in our history is a real testament to our students' determination and speaks volumes to the strength of our faculty and overall program.

From Trinity's charter class, two Canadian citizens participated in the Canadian Resident matching Service (CaRMS) and one obtained a first-year position. These same students both matched with first-year positions through the US NRMP.

Below is our short but significant list representative of their success.

Specialty	Hospital	State/Province
Surgery	Henry Ford Hospital	Michigan
Medical Genetics	University of Manitoba	Manitoba
Internal Medicine	Danbury Hospital	Connecticut
Internal Medicine	University of Medicine & Dentistry New Jersey	New Jersey
Internal Medicine-Pediatrics	University of Chicago	Illinois
Internal Medicine-Pediatrics	Case Western MetroHealth	Ohio
OB/GYN	Jamaica Hospital	New York
OB/GYN	Nassau University Medical Center	New York

http://blog.trinityschoolofmedicine.org/blog-compare_Caribbean_-Medical_Schools/bid/81033/Trinity-School-of-Medicine-announces-results-of-the-2012-National-Residency-Match-Program-NRMP-and-2012-Canadian-Resident-Matching-Service-CaRMS

Trinity News

Trinity Newspaper:

~ Want to help with the online newspaper? Contact Madison at miller.madisonr@gmail.com

~ If you have a funny picture or interesting article please contact Madison

**Please email Madison if you would like to UNSUBSCRIBE from the newspaper or change your email address.

* The Scalpel will be sent out 3 times a semester.

AMSA Update:

~ Fundraising is now going towards the World Pediatric Project, but they will still be collecting school supplies and clothes for St. Benedicts Orphanage

~ Keep an eye out for new events:

- ~ Dodgeball Tournament
- ~ Talent Show
- ~ Post-Uni Fundraiser at Shark Bar (DJ will be by our very own Chris Powers!!)

~ Other events to come!

Please remember to sign up as a member of AMSA, at www.amsa.org there are so many advantages and only cost $75 USD

Please email AMSA if you have any questions: Drewclare25@gmail.com

SMS Update:

Keep an Eye out for other events to come!

~ Casting Workshop – Wed, May 30 2-4

~ Disaster Simulation – Red Cross – Dates to come

Contact Harsh Dua to become a member and attend these events harshit@ualberta.ca

Please email SMS if you have any questions: Team@socmsx.org

Medical Spanish Update:

~ The Medical Spanish club will be starting soon!

~ The sessions will go over the same material: anatomy vocabulary, vocabulary of clinical symptoms, and a doctor/patient dialogue

~ For more information please contact Trakia Knowles at tknowlesmd@gmail.com

SGA Update:

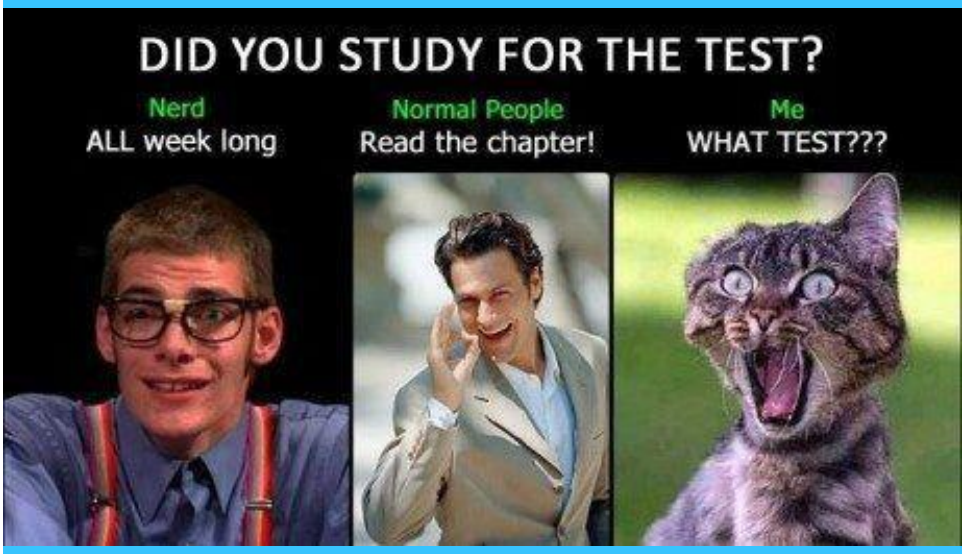
~ Congratulations to the new executive board:
President – Francois David
Vice President – Madison Miller
Treasurer – Carlos Alvarez
Secretary – Courtney Voce

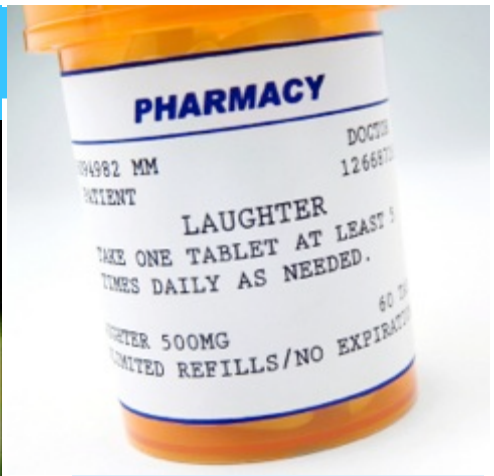
~ Thank you to the past SGA executives!

Research Committee Update:

~ The first research club meeting is this Wednesday May 23 at 12:10pm in the term 3 classroom

Take a second to SMILE!

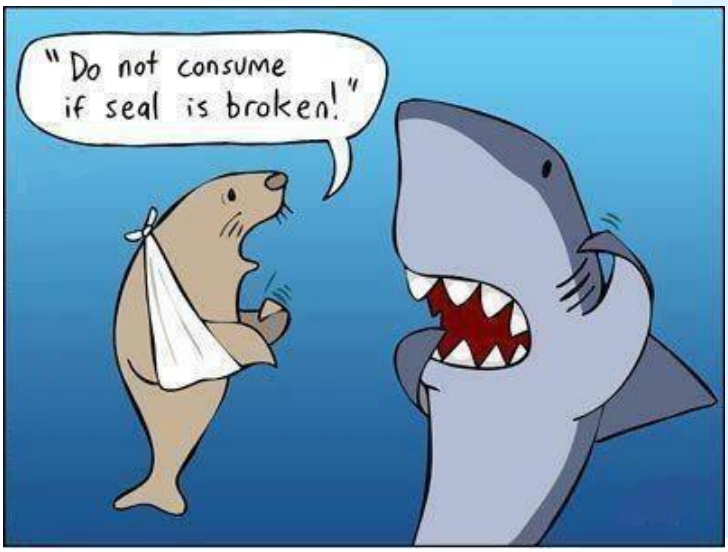




Good Luck on Uni 1! Happy Studies!

Ask the patient where he's feeling the pain.

Press that spot several times



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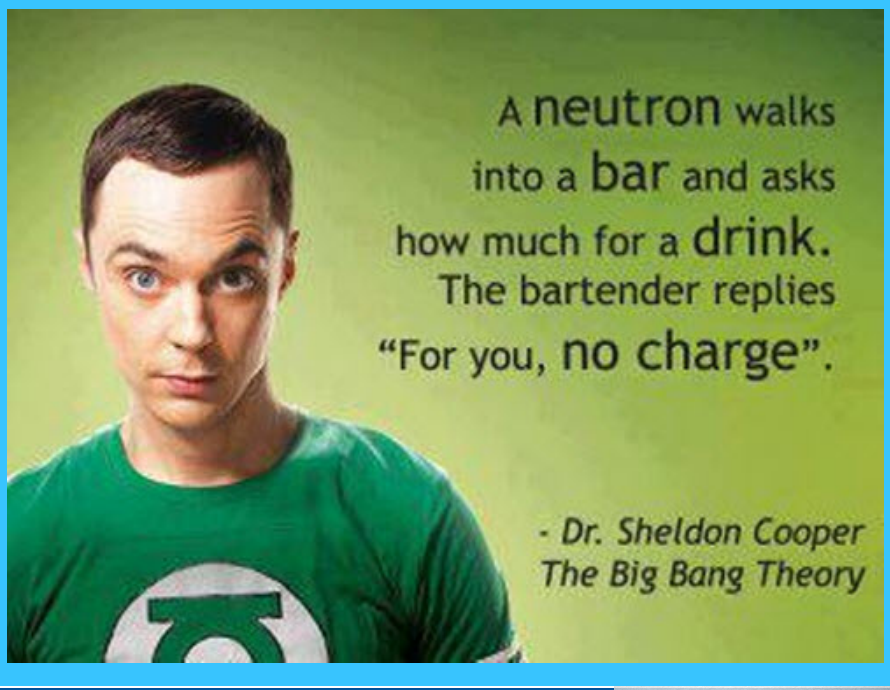

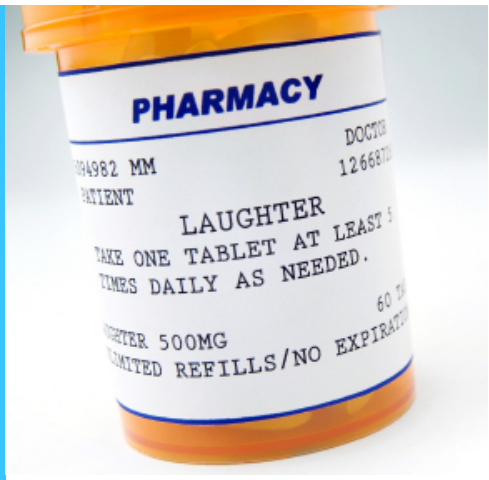

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Written by:

Trinity News Staff

Pictures provided by:
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http://iddxblog.blogspot.com/2008/05/comic-med-student-syndrome.html