The Bayou Tech

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President's Corner

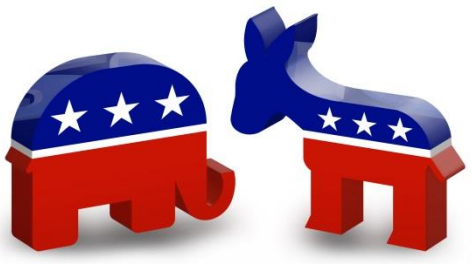
We had an awesome ASCLS-MS/LSCLS Bi-State Meeting in Biloxi in April. It was great to see everyone there and if you were unable to attend you missed out on a great meeting. We hope you will go ahead and make plans to attend the 2019 LSCLS/ASCLS Bi-State meeting in Monroe. Keep your eyes open for more details to come. I would like to personally congratulate all the award, paper and scholarship winners. Great Job!!

We have many projects we are working on this year. There are several ways to get involved with LSCLS. If you are interested in getting involved with the organization, please contact me. To stay connected with LSCLS, please make sure your email address is up to date on the LSCLS website. Also, be sure to like us on Facebook.

I'm looking forward to seeing everyone at the ASCLS Annual meeting in Chicago!

Karen Williams
LSCLS President

The Political Rundown



The ASCLS Legislative Symposium was held in Washington, D.C. March 19-20, 2018. The Louisiana delegation included President Karen Williams, Luke Caruso, Lacy Falke, Karrie Hovis, and Cheryl Caskey.

One issue discussed there was the flawed attempt to set "marketing pricing" for the Clinical Laboratory Fee Schedule (CLFS). The Protecting Access to Medicare Act (PAMA) of 2014 was to set a market-based Clinical Laboratory Fee Schedule. It required "applicable laboratories" to report private payor payment rates and the associated test volume for those laboratory services defined by CMS. The intent of PAMA was to ensure true market-based pricing by setting the fee schedule to a weighted median of the collected data. The definition of "applicable laboratory" was modified, skewing the data collection and artificially lowered the weighted median of payment rates.

In 2016, CMS had estimated 3500 laboratories would report data, but about half that number actually reported data. Ninety percent (90%) of the data reported came from independent laboratories. Hospitals and physician office laboratories provide 44% of laboratory services under Medicare, but only represent 8.5% of the reporting entities. Less than 1% of hospitals and physician office laboratories reported data and just 1.85% of data was collected from rural area laboratories.

Hospital laboratories represent 24% of the laboratory billing from the CLFS, but data was collected from just 21 of the 6994 hospital laboratories. Physician office laboratories represent 20% of laboratory billing for Medicare but only 1106 of the approximately 236,000 of those laboratories reported data. The data collected does not represent market-based data.

Smaller, local, independent, physician office and hospital laboratories that operate closest to the patient and clinician provide services to nursing homes, patients with chronic conditions, and those needing same day information are impacted. Laboratories are responding by reducing staff, cutting back on capital investment and leaving clinicians without important tools to quickly diagnose and treat patients.

Congressional members were asked to make a statutory adjustment to the CLFS payments that provides short term relief and allows time to revise the rate setting process conducted by CMS; ensure a valid stratified random data sample is collected by CMS that represents all segments of the laboratory market; require that data collection requirements streamline collection to reduce the burden on participating laboratories; and revise PAMA statutory requirements to calculate final CLFS payment rates per code as a weighted mean proportionate to laboratory type, market share, and geography.

The growing crisis in the clinical laboratory workforce was the second issue lobbied to our congressional members. A growing patient population and the number and complexity of medical laboratory tests are putting strains on the profession whose numbers are barely growing. Congress was asked to address this concern within the Veterans Health Administration (VA) and to begin to address the concern throughout the health care system. We asked for enhanced recruitment and retention within the VA by providing resources to host clinical rotations from clinical laboratory science and technology programs, authorize and appropriate funding for a program to ensure training for citizens seeking to enter the clinical laboratory workforce within the Public Health Service Act, and to authorize the Government Accountability Office to study the shortage of clinical laboratory personnel and its impact on the healthcare system and then make recommendations to Congress.

There were almost 8700 comments submitted to CMS about the proposed changes to the CLIA personnel regulations. ASCLS submitted comments and a grassroots campaign generated about 1200 responses. ASCLS also put a post on Facebook that reached 93,000 people.

On the state side, the American Association of Bioanalysts (AAB) had Louisiana Senate Bill 506 introduced to amend the laboratory licensure law; the amendments proposed were to the Clinical Laboratory Personnel Committee. Patsy Jarreau, Angela Foley, and Dr. Vincent Culotta from the Louisiana State Board of Medical Examiners, and AAB representatives met with Senator Mills, the chair of the committee considering the bill.

The group agreed to an amended bill that would add two members to the committee, one university administrator from a community college nominated by the Louisiana Community and Technical College system and one educator from a 2 or 4 year degree program nominated by the Board of Regents. AAB gave up the associate degree generalist committee position proposed in the original bill as well as their nominating ability for several other positions. The amended bill has moved out of committee. No further information was available on the bill status at press time.

Submitted by Cheryl Caskey MLS(ASCP)^{CM}

Hot Topic

Hepatitis C virus: Understanding the current epidemic

The United States is currently facing a debilitating Hepatitis C virus (HCV) epidemic, one that is intimately tied to the injection opioid drug use epidemic. In 2015, according to the World Health Organization (WHO), there were nearly 2 million new HCV infections worldwide, and the Centers for Disease Control and Prevention (CDC) reported an estimated 34,000 new cases in the United States. Of those new HCV cases in the U.S., nearly 40% of patients reported some type of risky behavior such as injection drug use.

HCV is the most common bloodborne infection in U.S., the most frequent cause of liver disease and liver cancer, and the leading indicator for liver transplant. Today, injection drug use is the primary risk factor for HCV transmission and the leading cause of HCV incidence in the U.S. In fact, the combination of rising HCV incidence and injection opioid use is often called the “dual epidemic”. According to a report published by the CDC in the *American Journal of Public Health (AJPH)*, data collected from 2004 – 2014 show that new cases of HCV are increasing nationwide, mostly in young people below the age of 40, and those increases are positively correlated to the rise in injection opioid use. During those 10 years, the incidence of HCV increased 400% in persons aged 18 to 29 years of age and 325% in persons aged 30 to 39 years of age. Injection opioid use for these age cohorts increased more than 622% in that same time period. HCV incidence also rose dramatically among women from 2004 – 2014 by 250%, while injection opioid use among women rose 99%. Incidence rates among women are of special concern because HCV can be transmitted from mother to baby. Correspondingly, the CDC also reports a 68% increase in infants born to HCV-positive mothers from 2011 – 2014.

HCV is a single-stranded RNA virus consisting of seven different genotypes, G1-G7, and more than 50 subtypes. Transmission occurs through exposure to contaminated blood and body fluids, via injection drug use, occupational needlestick injury, sexual contact, perinatal transmission, and unregulated tattooing and body piercing. Once a person is infected, the acute phase of HCV disease lasts about 6 months, with symptoms such as fatigue, nausea, fever, muscle aches, and jaundice appearing 6 – 7 weeks after exposure. Viral RNA can be detected in the serum using molecular diagnostics within 1 – 2 weeks after exposure. Anti-HCV antibodies develop and can be detected in the serum within 10 – 11 weeks after exposure.

When HCV infection has lasted for longer than 6 months, the chronic phase begins, where the viral infection has persisted long enough to cause significant inflammatory damage to the liver. Many patients with chronic HCV will experience symptoms like extreme fatigue, jaundice, decreased appetite and weight loss, ascites fluid buildup, vasculitis, dermatologic issues, and rheumatoid issues. Liver disease progression results from the persistent immune response and inflammation to the liver cells, or hepatocytes, for which HCV has a preferential affinity. Fat deposits between hepatocytes, causing the liver to enlarge. Constant inflammation results in necrosis of hepatocytes and the development of scar tissue. This connective tissue accumulation starts to harden, forming fibrotic areas throughout the liver. Progressive fibrosis leads to cirrhosis of the liver, and blood flow becomes obstructed, resulting in liver failure. In addition, high rates of cell turnover induce the development of hepatocellular carcinoma.

There is no vaccine for HCV, but major advancements in drug therapy can provide patients with 90% - 95% cure rates. These direct acting antivirals are highly effective HCV protease inhibitors that prevent viral replication and interfere with protein synthesis. However, these drug regimens are very cost-prohibitive for many patients.

In summary, HCV incidence and injection opioid use are major public health concerns in need of intensive education and testing programs. Initiatives for education, testing, and behavior intervention are being developed across the nation.

Submitted by Kristin Butler MLS(ASCP)^{CM}

Student Feature Article

Biotin Interference

Excerpts from "Biotin Interference on Thyroid Function Immunoassays" by Madison Arnett, LSU Health Shreveport, winner of the 2018 LSCLS Student Paper Award in Chemistry.

Supplemental biotin interference on diagnostic immunoassays has become a major laboratory concern. Assays testing for thyroid-stimulating hormone (TSH), total thyroxine (T4), total triiodothyronine (T3), free thyroxine (FT4), free triiodothyronine (FT3), parathyroid hormone (PTH), prolactin, N-terminal pro-brain natriuretic peptide (BNP), and 25-hydroxyvitamin D (25-OHD) are especially susceptible to biotin interference. Most concerning are the thyroid function tests, which may yield false results due to biotin interference and therefore misdiagnosis of hyperthyroidism for some patients. When patient samples are tested on chemistry analyzers utilizing biotinylated immunoassays, the excess biotin interferes with streptavidin in both sandwich and competitive immunoassays, causing falsely decreased thyroid stimulating hormone (TSH) and falsely increased triiodothyronine (T3) levels.

Biotin, also known as vitamin B7, is believed to improve the growth of hair, skin, and nails. Biotin is a component of normal diet, found in liver, eggs, fish, meat, nuts and, some vegetables, such as sweet potatoes. When ingested at levels found naturally in food, biotin does not interfere with laboratory tests. According to the Food and Drug Administration (FDA), the recommended daily biotin supplement intake for adults is 30 micrograms. An article in the *AACC Clinical Laboratory News* recently stated that the FDA released a safety communication in November urging more communication among laboratorians, clinicians, and patients about the importance of reporting biotin use to mitigate the risk of clinically significant incorrect lab test results[1].

Recent studies have suggested that high doses of biotin might be a safe and effective therapy for certain diseases, most notably multiple sclerosis (MS)[1, 2, 3]. Although not an FDA-approved therapy, high-dose biotin (100-300 milligrams (mg) per day, which is 10,000 times the daily adequate intake) is now being investigated as a treatment for progressive MS, as it is well tolerated and results in improvement of neurologic function.

Due to excess biotin in patient plasma, abnormal thyroid function results arise from competitive and sandwich immunoassays that utilize the streptavidin-biotin biotinylated immobilizing system. Streptavidin is a protein used in biotinylated immunoassays and has a very high affinity for biotin[3]. In competitive immunoassays, the biotin competes to bind with streptavidin sites, thus preventing the triiodothyronine (T3)-biotin signal antibody complex from binding. The low signal is misinterpreted by the analyzer as high T3 values in the patient sample. In sandwich immunoassays, excess biotin binds the streptavidin sites, thus preventing the thyroid stimulating hormone (TSH)-biotin-signal antibody complex from binding. The low signal is misinterpreted as low TSH values in the patient sample[4]. Therefore, excess biotin in the blood causes falsely decreased TSH levels and falsely increased T3 levels, correlating with the diagnosis of hyperthyroidism, which then results in further testing and the potential for increased cost, improper treatment, and patient anxiety.

Several case studies in the literature show that even small amounts of supplemental biotin can cause interference with chemistry tests, giving erroneous results for thyroid hormones and others like PTH, prolactin, and 25-OHD[3, 5, 6]. Misdiagnosis of diseases like hyperthyroidism, due to biotin interference with immunoassays, leads to unnecessary costs and procedures for patients, medical providers, and the lab. To reduce biotin inference with biotinylated immunoassays, clinicians should ask all patients if they are taking biotin supplements. Clinicians may not be aware of their laboratory's particular assay or this specific potential interference by biotin; hence, open communication between the laboratory and clinical providers will help ensure avoidance of potential interference and misinterpretation[3].

Notices of potential biotin interference should be found in the package inserts for each immunoassay, no matter the analyzer. Two notable analyzer systems that utilize streptavidin-biotin

biotinylated assays for several different hormones are the Roche Cobas e602 and the Siemens Vista Dimension 1500. As laboratory testing influences an estimated 70 percent of all healthcare decisions, the clinical laboratory is indispensable to patient diagnosis. Efficient collaboration and communication between laboratory personnel and clinicians should be exercised to expect interference, especially with thyroid function tests, thereby preventing misdiagnosis and unnecessary treatments. Furthermore, it is important for laboratory personnel to stay updated on biotin interference in various immunoassays, so we can better educate clinicians of potential problems and aid the development of specific guidelines on biotin ingestion and sample collection.

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2. Birnbaum, G., Stulc, J., & Snyder, T. High dose biotin as treatment for progressive multiple sclerosis. ANN Publications. ePoster. Submitted September 14, 2016.
3. Minkovsky, A., Lee, M. N., Dowlatshahi, M., Angell, T. E., Mahrokhian, L. S., Petrides, A. K., & Woodmansee, W. W. High-dose biotin treatment for secondary progressive multiple sclerosis may interfere with thyroid assays. AACE Clinical Case Reports, 2009;2(4), 370-373.
4. Brennan, J. & Lee, S. High-dose biotin supplement can interfere with common laboratory tests. Endocrine Today. Published November 2016. Retrieved February 11, 2018.
5. Elston, M.S., Sehgal, S., Toit, S.D., Yarndley, T., & Conaglen, J.V. Factitious graves disease due to biotin immunoassay interference: a case and review of the literature. The Journal of Clinical Endocrinology & Metabolism. 2009;101(9), 3251-3255.
6. Li D., Radulescu A., Shrestha R.T., Root M., Karger A.B., Killeen A.A.,…Burmeister, L.A. Association of biotin ingestion with performance of hormone and nonhormone assays in healthy adults. JAMA. 2017;318(12), 1150-1160.

Tell Us Your Story

Tell us how you have impacted Patient Care.

Visit the Road to Understanding at http://www.ascls.org/advocacy-issues/share-your-story.

New Event at the Bi-State Meeting

This year we launched a Student and New Professional Mixer during the annual meeting. We had a great turn out and hope to grow this event in the coming years. There was rock climbing, food, and arcade games! See everyone next year as we continue with this new tradition.

Meet Your Officers

President	Karen Williams
President-Elect	James Gardner
Past-President	Michele Werner
Secretary	Stephanie Blackburn
Treasurer	Joette Taylor
New Professional Chair	Jessica Lawless
Area I Rep	Kristin Butler
Area II Rep	Evelyn Tidwell
Area III Rep	Sheryl Herring
Area IV Rep	Sonya Hidalgo
Area V Rep	Anna Cavalier
Area VI Rep	Deborah Fox
Area VII Rep	Luke Caruso

Star Members

We had our annual meeting and awards banquet in Biloxi, MS in April. The following members received awards for 2018. We are proud of such a rich membership and these members are more than deserving of their accomplishments.

Member of the Year
Dana Grant

Educator of the Year
Debbie Wisenor

Student of the Year
Sabra Hanna

50 Year Special Membership Award
Barbara Floyd
Dorothy Edwards

40 Year Special Membership Award
Glynn Pellerin

30 Year Special Membership Award
Roxanna Stears

20 Year Special Membership Award
Debbie Wisenor
Darlene Huhner

10 Year Special Membership Award
Jessica Peel
Melanie Ellerbee

Presidential Service Award
James Gardner
Vanessa Johnson
Jessica Lasiter
Michele Werner

Keys to the Future Award
Jessica Lawless
Kayleigh Ellis
Lacy Falke

Omicron Sigma Awards

National: Karrie Hovis
Cheryl Caskey

Region: Stephanie Blackburn
Luke Caruso
Kyleigh Ellis
Lynda Britton
Karen Williams
James Gardner

State: Michele Werner
Gaye Brunson
Joette Taylor
Jessica Lasiter
Vanessa Johnson
Vinh Nguyen
Norma Bivona
Jessica Lawless

Student Member Highlights

Student members are a crucial part of our organization. We recognize elected officers to our Student Forum and encourage participation in all LSCLS business throughout the year. The Student Forum Chair also serves as a voting delegate at the ASCLS Annual Meeting.

We would like to introduce you to your new **Student Forum Officers**!

Student Forum Chair: Alejandra Perez
School: LSU Shreveport School of Allied Health

“But when you give to someone in need, don’t let your left hand know what your right hand is doing”
-Mathew 6:3

This verse has resonated with me since I heard it as a child. As a medical laboratory scientist I get to help doctors and nurses save lives and improve patient care. The patient sees those doctors and nurses with a thankful heart and may not think twice about the critical lab values resulted by a passionate and diligent scientist behind the scenes who also worked hard to make sure they were taken care of! This career choice suits me so well bringing my greatest passions together- serving people, science and medicine!

Student Forum Vice-Chair: Brennan Thompson
School: University of Louisiana at Monroe

Student Forum Secretary: Name: Ann-Marie Kimble
School: University of Louisiana at Monroe

There are a lot of reasons that I chose to become an MLS. I always knew that I wanted to work in healthcare, but I didn’t learn about this profession until I was applying to college. The more I learned about it, the more interested I was. It allows you to contribute to the outcome of so many patients by discovering what is going on inside their bodies. An MLS is often the first person to actually know what is causing a patient’s illness. I also love that there are so many different career options and work settings available for an MLS. This profession really opens the doors for a lot of opportunities, whether it’s specializing in one department, becoming a lab manager, or furthering your education. Medical Laboratory Science plays a critical role in healthcare, and it is something I am very passionate about!

In addition to the Student Forum, we also congratulate all the students that attended the LSCLS Annual Bi-State Meeting held with Mississippi and Northern Florida. These students gather once per year to compete in a Student Quiz Bowl competition that tests their knowledge in all areas of the laboratory. Their enthusiasm for and understanding of our industry is a source of great inspiration to the other members present.

This year we honor Team 1 from the University of Louisiana Monroe for finishing

1st Place

2nd Place

LSUHSC – New Orleans

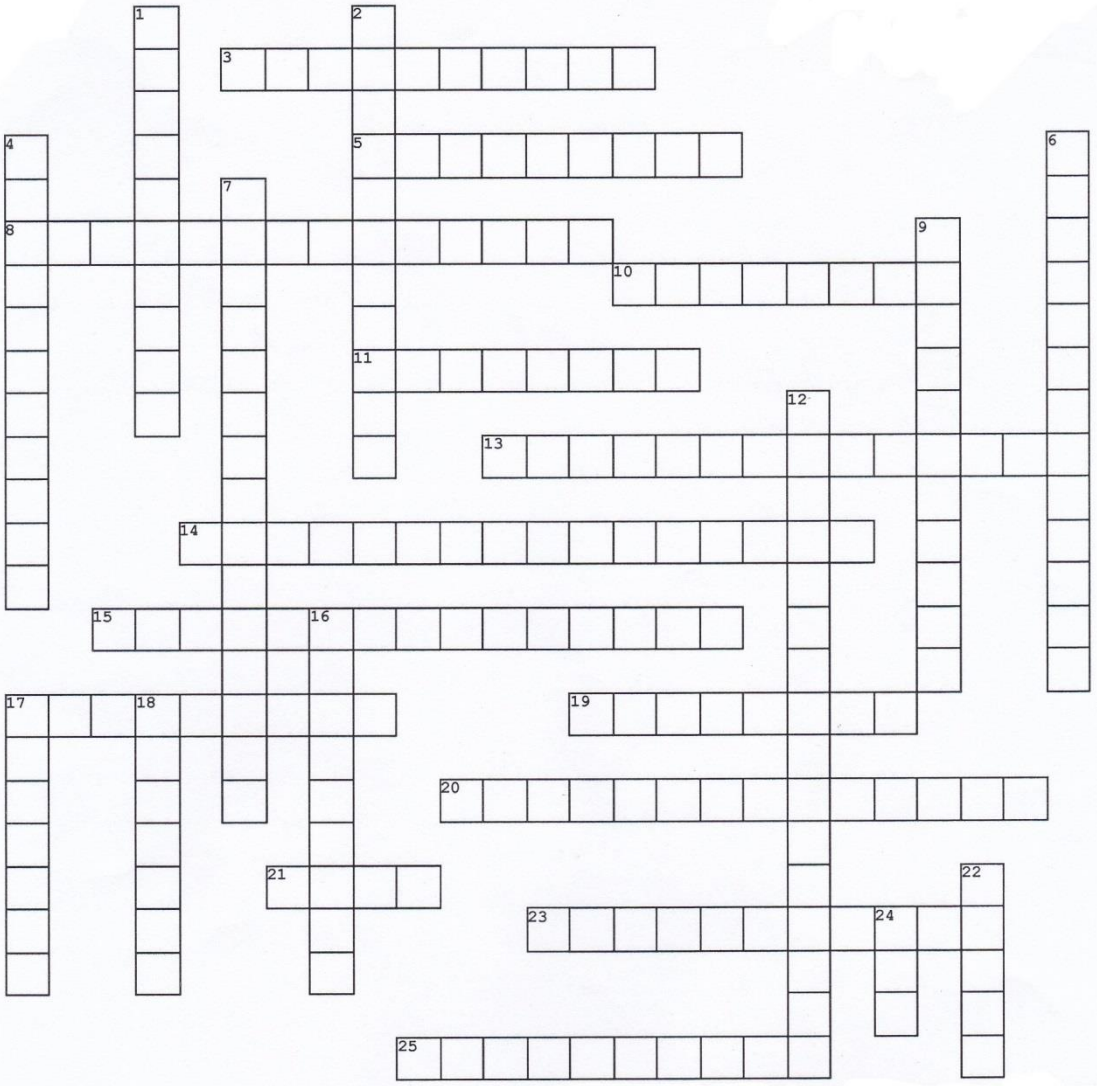
Every year we award a scholarship to a group of students who submit a research paper in one of several categories. The following students won their categories and received this scholarship award.

Student Paper Awards

- **Immunology:** *Steroid-Refractory Graft-Versus-Host Disease Experimental Treatments*, Megan Blakley, LSU Health Shreveport
- **Hematology:** *The Effectiveness of CAR T-cell Therapy as Treatment for Acute Lymphoblastic Leukemia,* Gloriana Sanders, LSU Health Shreveport
- **Microbiology:** *Antimicrobial Peptides as Antifungal Agents*, Yadira Ocanas, LSU Health Shreveport
- **Chemistry/Clinical Microscopy:** *Biotin Interference on Thyroid Function Immunoassays*, Madison R. Arnett, LSU Health Shreveport
- **Administration/Education:** *Effects of Troponin Point-of-Care Testing on Emergency Department Overcrowding,* Alexandra Cheung, LSU Health Shreveport

Knowledge Challenge

Complete the crossword below



Across

3. Auto antibodies against Thyroglobulin cause what disease
5. The Diazo Reaction is used on a urine dip stick to detect this compound
8. What do markers CD41, CD42, and CD61 signify
10. This DNA mutation type is when a nucleotide is changed and a stop codon is introduced
11. Forms in the presence of increased serum proteins
13. Urine crystal found in acidic urine resembling an envelope; can also be associated with antifreeze poisoning
14. This protein is increased in amniotic fluid and maternal serum in neural tube defects
15. Confirmatory test when the rosette test is positive
17. This member of Enterobacteriacea is urea, deaminase, indole, and H2S positive
19. Hormone originating from the adrenal cortex that increases glucose by stimulating gluconeogenesis
20. Which anemia is characterized by normal to increased serum ferritin, decreased serum iron, and decreased TIBC
21. The presence of monosodium urate crystals in synovial fluid indicates what disorder
23. Gram positive, lancet-shaped diplococci that is alpha hemolytic with crater-like colonies or mucoid 'water drop' colonies
25. This antibiotic inhibits nucleic acid synthesis

Down

1. The measure of the total concentration of dissolved particles in a solution
2. This virus causes negri bodies in the brain tissue of infected animals
4. Which disorder of hemostasis is characterized by a deficiency in Factor IX
6. This factor binds platelets via the glycoprotein 1B/V/IX receptor and also binds Factor VIII to the platelet surface
7. This yeast has numerous blastoconidia along pseudohyphae, terminal chlamydoconidia, and is germ tube positive in 2 hours
9. In which hemoglobinopathy is there a substitution of lysine for glutamic acid in the 6th position of the beta chain
12. Anti-A1 lectin
16. Can only be seen with a supravital stain such as Brilliant Cresyl Blue or New Methylene Blue
17. The most common helminth parasite in humans
18. The therapeutic drug used to treat bipolar disorder
22. Compares most recent patient results with previous results
24. Which class of immunoglobulins can cross the placenta

Knowledge Challenge Key

Across

3. Auto antibodies against Thyroglobulin cause what disease (**hashimotos**)
5. The Diazo Reaction is used on a urine dip stick to detect this compound (**bilirubin**)
8. What do markers CD41, CD42, and CD61 signify (**megakaryocytes**)
10. This DNA mutation type is when a nucleotide is changed and a stop codon is introduced (**nonsense**)
11. Forms in the presence of increased serum proteins (**rouleaux**)
13. Urine crystal found in acidic urine resembling an envelope; can also be associated with antifreeze poisoning (**calciumoxalate**)
14. This protein is increased in amniotic fluid and maternal serum in neural tube defects (**alphafetoprotein**)
15. Confirmatory test when the rosette test is positive (**kleinhauerbetke**)
17. This member of Enterobacteriacea is urea, deaminase, indole, and H2S positive (**pvulgaris**)
19. Hormone originating from the adrenal cortex that increases glucose by stimulating gluconeogenesis (**cortisol**)
20. Which anemia is characterized by normal to increased serum ferritin, decreased serum iron, and decreased TIBC (**chronicdisease**)
21. The presence of monosodium urate crystals in synovial fluid indicates what disorder (**gout**)
23. Gram positive, lancet-shaped diplococci that is alpha hemolytic with crater-like colonies or mucoid 'water drop' colonies (**spneumoniae**)
25. This antibiotic inhibits nucleic acid synthesis (**quinolines**)

Down

1. The measure of the total concentration of dissolved particles in a solution (**osmolality**)
2. This virus causes negri bodies in the brain tissue of infected animals (**rhabdovirus**)
4. Which disorder of hemostasis is characterized by a deficiency in Factor IX (**hemophiliab**)
6. This factor binds platelets via the glycoprotein 1B/V/IX receptor and also binds Factor VIII to the platelet surface (**vonwillebrand**)
7. This yeast has numerous blastoconidia along pseudohyphae, terminal chlamydoconidia, and is germ tube positive in 2 hours (**candidaalbicans**)
9. In which hemoglobinopathy is there a substitution of lysine for glutamic acid in the 6th position of the beta chain (**hemoglobinc**)
12. Anti-A1 lectin (**dolichosbiflorus**)
16. Can only be seen with a supravital stain such as Brilliant Cresyl Blue or New Methylene Blue (**heinzbody**)
17. The most common helminth parasite in humans (**pinworm**)
18. The therapeutic drug used to treat bipolar disorder (**lithium**)
22. Compares most recent patient results with previous results (**delta**)
24. Which class of immunoglobulins can cross the placenta (**igg**)