



NEW - Now Available!
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Steven B. Jobst, MD

James B. Hannah, MD

Cynthia L. Douglas, MD

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Gary C. Ponto, MD

Hugh R. Byers, MD, PhD

Johanna L. Baran, MD

Advances in Group B Streptococcus (GBS) Testing

Submitted by: Marilyn Sarina, BMLSc, ART, MT (ASCP), CLS- Supervisor, Microbiology

Because Group B Streptococcus (GBS) is a significant cause of invasive disease in neonates and colonization of the mother is the primary risk factor for GBS disease in newborns, Central Coast Pathology Laboratory added GBS by molecular testing to our menu.

In an evaluation published in the New England Journal of Medicine in 2009 by Melissa K. VanDyke, PhD, it was found that 74.4% of GBS disease occurs in term infants. A total of 61.4% of the term infants with GBS disease were born to women who had tested negative for GBS before delivery. 99.5% of the women in the study were tested by culture.

The CDC guidelines for antenatal testing recommend universal late antepartum screening at 35-37 weeks, utilizing a broth enrichment step for increased sensitivity. According to the literature, GBS by culture has been shown to have between a 42.3% and 68.4% sensitivity rate. Data shows that GBS by molecular testing increases sensitivity to 97%, thereby significantly reducing false negatives which may lead to the risk of newborn infection, mortality, and long term complications.

Since the implementation of universal GBS screening and intrapartum antibiotic prophylaxis, the incidence of perinatal GBS disease has declined significantly. However, GBS disease continues to be the leading infectious cause of morbidity and mortality among newborns in the United States. Given that antenatal screening for GBS is the sole predictor of intrapartum colonization status, selection of the appropriate test and proper collection is paramount.

Per CDC recommendations, specimens undergo a broth enrichment for an 18-24 hour incubation period prior to testing. Turnaround times are improved in comparison to culture which can take 2-3 days.

Serving Our Community for Nearly 30 Years

Submitted by: Jenifer Giraud, Director- Business Development

With approximately 200 Central Coast residents employed at Central Coast Pathology Laboratory, and nearly 30 years of serving the local community, CCPL is committed to continuous improvement, as well as to providing comprehensive laboratory services to meet the needs of people living on the Central Coast.

A survey conducted of medical providers and patients in early 2012 by Central Coast Pathology Laboratory, found overwhelming high satisfaction rates in both service and quality of testing. Patients surveyed reported a 99% satisfaction rate, with **100% willing to recommend Central Coast Pathology to others**. One patient reported: "Central Coast Pathology is awesome! I took my daughter there and loved the way they treated her so I switched to come here also. You guys are great!" In addition, local medical providers reported an impressive 92% overall satisfaction rate with CCPL services. As a result of our commitment, Central Coast Pathology continues to bring on new technologies and testing at our state-of-the-art laboratory in San Luis Obispo.



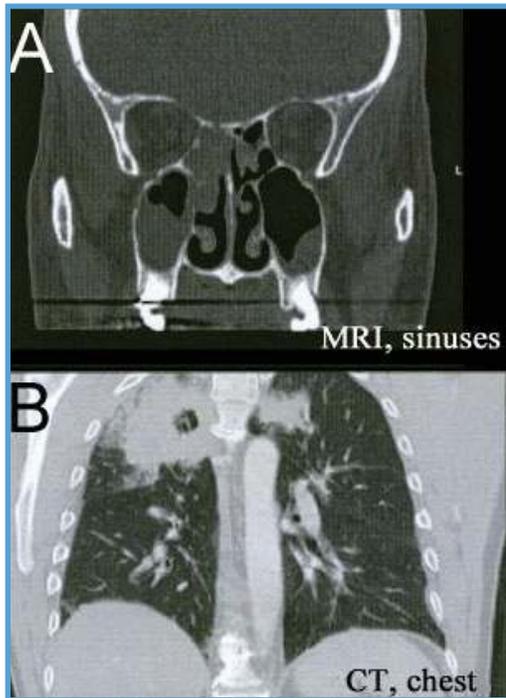
230 Station Way

Due to a high demand for quality laboratory services by both patients and medical providers, Central Coast Pathology Laboratory opened an additional Patient Service Center, located in Arroyo Grande, to better serve our community.

Value of a Skin Biopsy in an Acute Systemic Syndrome

Submitted by: Bruce D. Ragsdale, M.D.- Director, Western Dermatopathology
& Larisa M. Lehmer, BS, MA - Research Associate

Figure 1: Radiography



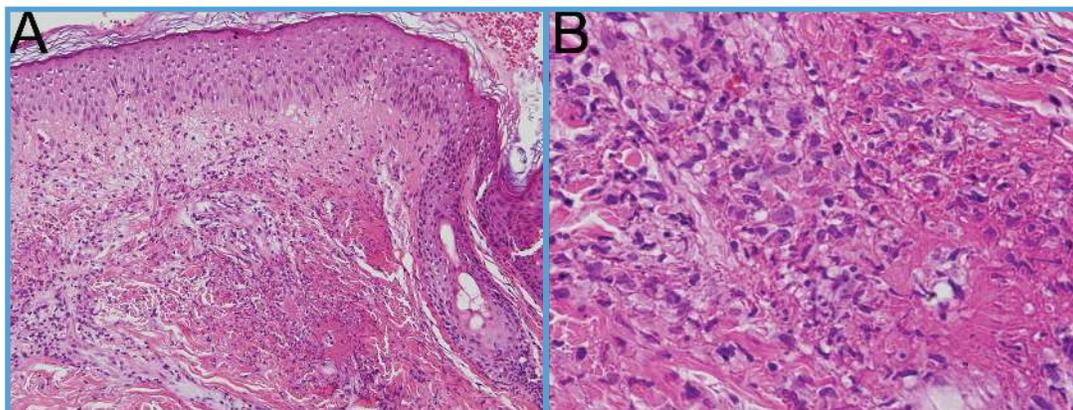
A 52-year-old male was seen as an outpatient for a productive cough and treated for community acquired pneumonia. Seventeen days later, he returned to the emergency room with high fever (up to 102.8°F), night sweats, weight loss, generalized fatigue, and increased productive cough with yellow sputum but no wheezing or significant shortness of breath. History of travel to the Central Valley of California and to Mexico raised concern for tuberculosis or coccidioidomycosis. Radiologic studies displayed cavitary lung lesions and sinus involvement (Fig. 1 A,B). Biopsy of a 2 x 9-cm, right-forearm patch of "non-dermatomal, early vesicular lesions in the same state of maturation" displayed leukocytoclastic vasculitis (Fig. 2 A,B), that, with the clinical context (history and microscopic hematuria) and radiology, fit Wegener's granulomatosis, obviating lung and/or renal biopsy.

Cutaneous vasculitis manifests most frequently as palpable purpura or infiltrated erythema indicating dermal superficial, small vessel vasculitis and less commonly as nodular erythema, livedo racemosa, deep ulcers, or digital gangrene implicating deep dermal or subcutaneous, muscular vessel vasculitis. It may be the presenting sign of a serious systemic vasculitic disorder (i.e. rheumatoid vasculitis, lupus vasculitis, Churg-Strauss syndrome, microscopic polyangiitis, Wegener's granulomatosis). However, the clinical manifestations of vasculitis are protean and overlap with many other disorders, most often vaso-occlusive or hemorrhagic diseases, rendering confident diagnosis a

challenge. Clinical findings of palpable purpura, neuropathy and microscopic hematuria are indicative of a vasculitic process, the diagnosis of which can be corroborated by biopsy (skin, kidney, or temporal artery). Cutaneous histopathology confirmed the diagnosis of Wegener's granulomatosis by demonstrating histiocytes (granulomatous inflammation) participating in the small vessel vasculitis, obviating the use of more invasive studies such as open lung or kidney biopsy.

Wegener's granulomatosis (WG) is an uncommon, multisystem inflammatory illness that results in restricted blood flow to the organs, most often affecting the respiratory tract and the kidneys. It is an antineutrophil cytoplasmic antibody (ANCA) associated vasculitis of yet unknown etiology and pathogenesis, thought to be the result of an immunological disturbance triggered by an infection. If left untreated, WG has a one-year mortality rate of 80%. Oral corticosteroids given with cyclophosphamide is the treatment of choice. This patient was treated with SoluMedrol 1g x 3 days, one dose cyclophosphamide 1300 mg with MESNA, an 8-month prednisone taper starting at 60 mg/day, and as of his last physical exam, 40 months post-biopsy, is continuing on a maintenance dose of methotrexate 7.5 mg/week with no cutaneous vasculitis or nodules, sinus, respiratory, or renal problems.

Figure 2: Leukocytoclastic vasculitis with histiocyte participation



Low power, x200

High power, x400

Guidelines for Cervical Cancer Screening and HPV Testing

Submitted by: James Hannah, MD

Cervical cancer screening, initiated in the mid-twentieth century, has successfully decreased squamous cell cervical cancer incidence and mortality by approximately 80%. Cervical cancer, once the most frequent cause of cancer death in women, now ranks 14th for cancer deaths. This reduction is due to the detection through screening, and the treatment of pre-invasive and early stage lesions. Despite this marked reduction, in 2012 an estimated 12,170 cervical cancer cases will be diagnosed in the United States and approximately 4,220 women will die. About one-half of these cervical cancers are in women who were never screened or were not screened in the last 5 years.

The establishment of the causal link between HPV and cervical cancer and understanding of the epidemiology and natural history of these HPV infections is leading to an evolution in our screening methods and management of screening results. Persistent infection with high risk HPV genotypes is necessary for the development of cervical cancer and its precursor lesions (High grade squamous intraepithelial lesion/CIN 3). There are approximately 20 known high risk HPV genotypes. HPV type 16 is the most carcinogenic and accounts for 55-60% of cervical carcinomas, HPV type 18 is the next most carcinogenic, associated with 10-15% of cervical cancers, with remaining high risk genotypes responsible for the other 25-35% of cases. Most HPV infections are transient, becoming undetectable in 1-2 years. Women whose high risk HPV infections persist beyond that interval, especially HPV type 16, are at significant risk of developing precancerous lesions in subsequent years (20-30% risk of developing CIN 3 over 5 years). Untreated CIN 3 has a 30% probability of becoming an invasive carcinoma over a 30 year period, although only about 1% of treated CIN 3 will become invasive.

The purpose of screening is to prevent the morbidity of and mortality from cervical cancer; optimally we would like to identify those precursors likely to progress to invasive cancer and avoid the unnecessary treatment of transient HPV infections. The downside to aggressive screening is significantly increased costs and the risk of overtreatment, particularly cervical cone biopsies which are associated with increased risk of preterm birth and miscarriage. The advent of molecular HPV testing has led to new strategies to allow both more specific diagnoses and increased screening intervals. **The combined HPV/PAP test is estimated to have a sensitivity of greater than 95%.**

In 2010, Central Coast Pathology Laboratory distributed the screening guidelines developed by the American Society of Colposcopy and Cervical Pathology (ASCCP). A recent symposium including the ASCCP, American Cancer Society and American Society of Clinical Pathology along with 25 other organizations developed a similar set of recommendations for screening and management of screen results. ([Link to update](#))

Since the ASCCP guidelines came out 2 years ago, we have received some specific questions about these screening changes:

Q. Why is the molecular HPV test not recommended for screening patients under 30 years old?

A. The prevalence of HPV infection in women in their 20's is approximately 50%, falling to less than 20% of women in their 30's and 5-10% in older women. Because of the high incidence in this younger population, the molecular test would yield many positive HPV tests that would eventually be cleared.

Q. How do I manage a patient with a positive HPV test and negative PAP?

A. There are two options: Co-test (PAP/HPV) in 12 months or further test for HPV genotypes 16/18. If either of these genotypes is positive, refer to colposcopy. If both are negative, then 12 month follow-up with co-testing.

Q. Is testing still necessary for those patients who have received the HPV vaccine?

A. The HPV vaccine protects against only 4 genotypes, two high risk forms (16 and 18) and two low risk forms that cause viral warts (6 and 11). There are an additional 18 high risk genotypes not included in the vaccine, so routine screening is still recommended for this population.

Q. I have a patient with a Pap Dx of LSIL but negative testing for high risk HPV? Is this correct?

A. While about 90% of our cases diagnosed as LSIL will test positive for high risk forms of HPV, a small percentage of cases are associated with low risk forms of HPV.

Notes and Statistics:

- Approximately 55% of our cases diagnosed with ASCUS by PAP will be positive for high risk forms of HPV, 90% of LSILs will be positive and 95% of HSILs (we test the latter two categories only occasionally). In our population, 10% of women over 30 years old with normal Pap test will have a positive high risk HPV.
- Of those patients diagnosed by screening with ASCUS/HPV+ or LSIL, at colposcopy about 15% will have HSIL (CIN 2-3). Approximately 90% of patients with a pap Dx of HSIL will be confirmed with a similar diagnosis at colposcopy.
- Screening is effective for cervical squamous carcinoma. Only 50% of cervical adenocarcinomas are identified at screening, both because of location and that some of these tumors apparently are not induced by HPV. Endometrial and ovarian carcinomas are rarely identified by Pap screening.

Please feel free to contact our Cytology Dept. with any questions, feedback, or challenges.

Providing Quality Laboratory Services for Nearly 30 Years

Patient Service Centers

Request your **FREE** annual Cholesterol screen at any of our Patient Service Centers

Arroyo Grande ~ New Location

230 Station Way, Suite B • (805) 202-2015
Monday-Friday 7 am to 5 pm

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2121 10th Street • (805) 528-9505
Monday-Friday 7 am to 11:30 am

Morro Bay

285 Marina Street • (805) 772-6415
Monday-Friday 7 am to 12 pm

Paso Robles

416 Spring Street, Suite 102 • (805) 238-5500
Monday-Friday 7 am to 5 pm • Saturday 8 am to 12 pm

Pismo Beach

911 Oak Park Boulevard, Suite 103 • (805) 489-3650
Monday-Friday 6:30 am to 5 pm • Saturday 8 am to 12 pm

San Luis Obispo

3271 S. Higuera Street, Suite 102 • (805) 540-5140
Monday-Friday 7 am to 5 pm • Saturday 8 am to 12 pm

Santa Maria

937 E. Main Street, Suite 101 • (805) 928-9810
Monday-Friday 6:30 am to 5 pm • Saturday 8 am to 12 pm

Templeton

225 Posada Lane, Suite A • (805) 226-4990
Monday-Friday 7 am to 5 pm

Central Coast Pathology supports our community by participating in local Chamber and health focus efforts to benefit disease awareness & patient care.

American Heart Association



SLO Health & Fitness Expo



Central Coast Pathology is proud to maintain accreditation by the College of American Pathologists for conducting the

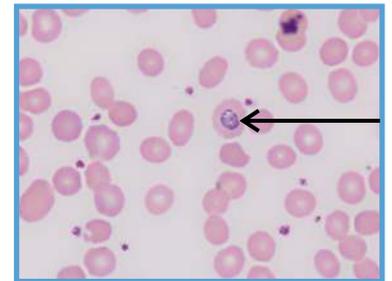
highest quality level of anatomic pathology and clinical laboratory testing.

An Unexpected Malaria

Submitted by: *Dian Robinson, CLS*
Contributors: *Michael Frost, MD and Marilyn Sarina, BMLSc, ART, MT (ASCP), CLS*

An otherwise healthy 23-year-old woman who recently returned from Pakistan and has intermittent fevers and a slight anemia is drawn for an anemia panel. During the peripheral smear scan while performing the reticulocyte count, the CLS sees something on the smear that just doesn't look right...Those small dark purple inclusions in the RBCs are malarial parasites!

The parasite that causes malaria is a protozoan called plasmodium. *P. vivax* and *P. falciparum* cause the most malaria in people, with the latter being responsible for the highest mortality. The majority of malaria cases diagnosed in the United States are imported, usually by persons who travel to countries where malaria is endemic, such as Africa, Asia (mostly in India, the Middle East, and Southeast Asia), Central and South America, Hispaniola, Eastern Europe and the South Pacific.



Plasmodium vivax

P. vivax is an endoparasite and is well-adapted to the parasitic mode of life. A female mosquito infects a person by taking a blood meal. First, sporozoites enter the bloodstream, and migrate to the liver. They infect liver cells, where they multiply into merozoites, rupture the liver cells, and escape back into the bloodstream. Then, the merozoites infect red blood cells, where they develop into ring forms, trophozoites and schizonts which in turn produce further merozoites. Sexual forms (gametocytes) are also produced, which, if taken up by a mosquito, will infect the insect and continue the life cycle.

Every year, 300 to 700 million people contract malaria. It kills 1 to 2 million people annually, 90% of which live in Africa. Most of the people who die from malaria are children. In Africa, 20% of children under five die from malaria. Most people who get malaria get symptoms 10–30 days after they get infected. But some people can get symptoms after only a week, while some may be infected with malaria and not have symptoms for years.

Symptoms of malaria may include arthralgia, headache, vomiting, malaise and fatigue, anemia, cough, liver or spleen enlargement, sweating, chills, delirium and coma. Pregnant women and young children have a higher incidence of complications, as well as people who get malaria for the first time. Complications of malaria are cerebral malaria, seizures, brain damage, blackwater fever (from the destruction of the red blood cells), pulmonary edema, very low blood sugar, hemolysis and coagulopathy.

In addition to considering malaria in the differential diagnosis for febrile patients with a history of travel to malarious areas, health care providers also should consider malaria as a possible cause of fever among patients who have not traveled but are experiencing alternating fevers, rigors, and sweats with no obvious cause.

Visit www.CCPathology.com for Locations and to Learn More