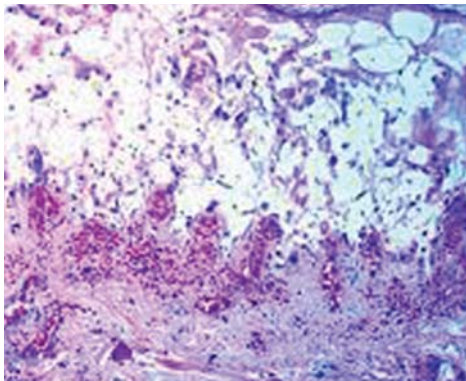




Diagnosing acute herpes, what tests to consider



Herpes simplex virus (HSV) is a double stranded DNA virus, which occurs worldwide. There are two types of HSV: HSV-1 and HSV-2. HSV-1, which has predominantly an oral transmission, is the most prevalent form in the U.S. and worldwide. While HSV-2 is not as prevalent as HSV-1, it is principally transmitted sexually and is the most common cause of genital herpes (>80%).

From a clinical perspective, the initial infection from the virus is generally not symptomatic. Instead, herpes infections typically exhibit periods of latency, which are followed by activation and reactivation of the virus and the accompanying clinical symptoms. These symptoms vary from mild disease, which is characterized by small ulcers in the mouth or vesicular lesions on the lips, skin or mucosal

continued on page 3

Does the new "Physician Signature Rule" apply to hospital labs?

On November 2, 2010, the Centers for Medicare and Medicaid Services (CMS) issued the 2011 Physician Fee Schedule Final Rule which was effective on January 1, 2011. Contained within that Rule were several provisions that affect all clinical laboratories including one that would require a physician (or nonphysician practitioner – NPP) signature on all requisitions for laboratory tests paid on the basis of the Clinical Laboratory Fee Schedule (CLFS). However, subsequent notice was given by CMS on December 21, 2010 that they would delay the enforcement of the physician signature requirement on laboratory requisitions until April 1, 2011.

How might this affect hospital laboratories?

This rule does not apply to hospital inpatients. But, it does apply to testing for registered outpatients as well as to patient testing which is sometimes referred to as

continued on page 7

Why is the *Bordetella pertussis* specimen collection procedure so important?

Bordetella pertussis infection is a serious public health concern and can cause significant morbidity and mortality. It can afflict unvaccinated children, previously vaccinated children, and adults in whom immunity has waned. The unimmunized infant is especially vulnerable to this disease.

Polymerase Chain Reaction (PCR) testing is the preferred method, over both DFA and culture, for the diagnosis of *Bordetella pertussis* infection and for the evaluation of family members or children who are attending day cares and have been exposed to confirmed cases of pertussis infection. PCR testing also allows for the detection and differentiation of *B. pertussis* from other species of *Bordetella*.



Kathy Snyder, a Molecular Diagnostics technologist, testing for Bordetella Pertussis

The specimen type and time of collection greatly influence the ability to detect *Bordetella pertussis*. It is essential to collect the specimen using optimal collection devices and handling procedures. Optimal specimens

continued on page 7

What to do about the flu?

Now that Influenza season is upon us, the PAML Virology Department would like to remind clients that there are some important collection requirements for specimens. These are the options, listed from most sensitive to least sensitive, with acceptable specimen types. Preferred viral transport media (VTM) is Remel M6 (other acceptable VTM are Remel M4, M4RT, M5, BD UTM, or Copan).

Transport all specimens refrigerated within 72 hours.

RESPCR	FLU A, FLU B and RSV by PCR	RSV, Flu A, Flu B by PCR. Sample=NP swab in VTM. No other specimen type acceptable. <i>Most sensitive.</i>
RESPRX	FLU A, FLU B and RSV by PCR (Reflexive)	RSV, Flu A, Flu B by PCR, will auto-reflex to flu sub-typing if Flu A detected. Sample=NP swab in VTM. No other specimen type acceptable. <i>Most sensitive.</i>
FLATYP	INFLUENZA A SUBTYPING RT-PCR (Reflexive)	Flu A by PCR, will auto-reflex to flu sub-typing if Flu A detected. Will NOT detect Flu B. Sample=NP swab in VTM. No other specimen type acceptable. <i>Most sensitive.</i>
FLUDFA	Influenza A & B Virus Antigen by DFA, reflexes to viral culture (Reflexive)	Direct patient fluorescent antibody screen (DFA) for Flu A & B, auto-reflexes to viral cult if neg. Sample= NP and/or throat swab in VTM, or nasal wash/asp in VTM, or BAL/Bronch in VTM. NO SPUTUM. <i>Moderately high sensitivity, especially when followed by culture.</i>
VRDFAR	Viral DFA Stain, Reflexes to Viral Culture (Reflexive)	DFA for Flu A, B, RSV, Parainfluenza 1,2,3, and Human Metapneumovirus (hMPV), auto-reflexes to complete viral culture if negative. Sample= NP and/or throat swab in VTM, or nasal wash/asp in VTM, or BAL/Bronch in VTM. NO SPUTUM. <i>Moderately high sensitivity, especially when followed by culture.</i>
VIRCUL	Viral Culture (Reflexive)	Viral culture for all common respiratory viruses. Sample= NP and/or throat swab in VTM, or nasal wash/asp in VTM, or BAL/Bronch in VTM. <i>Moderately high sensitivity.</i>
FLABAG	Influenza A & B Virus Antigen	Rapid membrane test for Flu A & B. Sample=NP and/or throat swab in VTM. <i>Least sensitive, a negative should be followed by culture.</i>

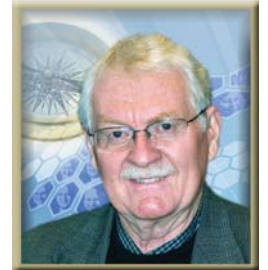
For Influenza PCR testing, only the NP swab in viral transport media is acceptable. The test reagents we use are FDA-approved (Prodesse Flu Fast™) and we must follow specimen collection instructions provided by the FDA.

For a specimen that does not meet the collection criteria for the PAML PCR tests, options that are available are a FLUDFA or VRDFAR - which are both sensitive tests for influenza - if a good collection was performed. If either of those tests is positive for Flu A, the isolate could be sent to the respective state lab for subtyping. Alternatively, these specimens could be referred to another lab for PCR that has validated that specimen type. ❖

PAML's chief executive officer retiring in 2011

Thomas O. Tiffany, PhD, DABCC, FACB, has announced that he will retire at the end of 2011 after serving as PAML's chief executive officer for 23 years.

Dr. Tiffany joined PAML in 1987 as its General Manager with just 125 employees. Under Tiffany's leadership, PAML



today is recognized as one of the ten largest reference laboratories in the United States. It has grown to over 1600 employees across seven partnerships. As one of the largest employers in Spokane, PAML provides laboratory services to over 102 hospitals throughout the country.

Dr. Tiffany has achieved a distinguished 40-year career in the Biomedical field. He grew up in the Spokane area, graduating from Eastern Washington State College in 1965 with a degree in chemistry. He went on to receive his Ph.D. in biochemistry and analytical chemistry from Oregon State University in 1969. He then completed post Doctoral training in Clinical Biochemistry at the State University of New York at Buffalo.

He started his professional career as a Senior Research Scientist at Oak Ridge National Laboratory in Oak Ridge Tennessee. Dr. Tiffany returned to Spokane in 1974 serving with various laboratories including Micro Biochemical Research Corporation, Instrumentation Laboratories, Allied Instrumentation Laboratories, and Spectrum Systems Inc., before joining PAML in 1987.

Dr. Tiffany is a Fellow of the National Academy of Clinical Biochemists, and a Diplomat of the American Board of Clinical Chemists. He also received his Certificate of Lay Ministry from Whitworth College in 2004.

The PAML Board of Directors will immediately begin a national search for a new CEO. ❖

Putting pain management into practice

Chronic pain affects about one-third of the U.S. population. As a result, prescriptions for opioids—one of the most effective pain relievers available—have increased dramatically in the past three decades. While this means that patients experiencing chronic pain are gaining access to effective therapy, prescription drug abuse has paralleled legitimate use creating a national public health problem. Recent studies have reported rates of opioid and/or illicit drug misuse exceeding 25% in both pain management and primary care clinics. Unfortunately, concerns about

addiction, drug abuse and diversion can be major barriers when managing chronic pain patients.

PAML, a SAMHSA-certified toxicology laboratory, is a leading provider of therapeutic drug monitoring and education to physicians and staff treating chronic pain. Their full-service Pain Management program offers compliance monitoring, program management, professional consultation and more. The laboratory relies upon sophisticated instrumentation and multiple detection systems including Gas Chromatography/Mass

Spectrometry (GC/MS), High Performance/High Pressure, (HPLC), Liquid Chromatography, and Gas Chromatography (GC).



PAML's Pain Management program provides analytical services to detect and quantify the concentration of both prescribed and illicit drugs in a patient's system. This includes qualitative, presumptive urine testing at the point of care; quantitative confirmation testing double-checked by tandem mass spectrometry; and 24-hour assistance in interpreting results. Drug screening may be performed on urine, blood serum or plasma, and hair at PAML, but urine is the sample of choice for symptomatic cases because drugs and their metabolites concentrate in the urine.

PAML has developed four different metabolic panels for detection limits appropriate to pain management testing. The panels are custom designed to detect the lower concentrations of more than 40 different substances. Each panel features a different combination of prescription pain medication, other medications and illicit substances for urine drug screening and analysis. Add-on and specialty tests are available if a physician has additional concerns. PAML also offers instant test products or point of collection testing as well as laboratory-based methodologies.

The PAML marketing representatives can help physicians select the right panel for their practice, assuring that the physician has all the information needed to provide the best chronic pain care. PAML also offers consulting services to all our clients. Physicians can call and speak directly to a PAML toxicologist about specific testing or to discuss patient test results.

For more information, please contact your marketing representative. ❖

Diagnosing acute herpes

membranes, to fatal disease. Fatality is primarily due to acute encephalitis in neonates or to widely disseminated disease causing pneumonia or encephalitis. Congenital disease due to intrauterine transmission can result in cutaneous lesions, retinitis, microcephaly or hydrocephalus.

Antiviral treatment is indicated for neonatal encephalitis, disseminated disease, primary and recurrent genital infections, and repeated reactivations.

continued from page 1

Early diagnosis, particularly in cases of acute encephalitis with or without focal neurologic abnormalities and in immunocompromised patients with disseminated herpes, may result in life saving treatment. To achieve this, the selection of the appropriate test for the specific condition is important. Please find below some general recommendations for testing in the diagnosis of acute herpes simplex virus infection. ❖

Clinical situation	Recommended Test	Comments
New or recurrent skin and/or mucosal lesions	DFA with reflex Viral culture = VRDFAR (or HSVETP for culture only) HSV antibody by ELISA = HSVG	Culture of skin vesicles and mucosal ulcers has a sensitivity of greater than 90% and specificity of 100%. Primary herpes infection is associated with high serum antibody titers, which remain elevated during convalescence. HSV-1 and HSV-2 type specific antibodies are available but may not be reliable for HSV typing, particularly in low prevalence populations and in early disease.
Viral Encephalitis, Meningoencephalitis, Meningitis Neonatal Herpes	HSV PCR = HSVRTD	Due to the low levels of virus present in the CSF, PCR is the preferred test. The sensitivity of PCR is ~98% and specificity approaches 100%. Due to the low viral loads in the CSF, viral culture on CSF is not as sensitive and is not recommended. Additional testing for other potential causative agents is also recommended.
Differential diagnosis: HSV-1 vs. HSV-2 infection	HSV antibody by Immunoblot = HSVB12	Due to the low levels of antibodies present in early stage disease, immunologic testing, including immunoblot testing, may not accurately distinguish between different types of HSV.

Advances in Molecular Diagnostics Testing

PAML's Molecular Diagnostics Laboratory provides multi-disciplinary services using state-of-the-art technology and instrumentation. The lab utilizes real-time PCR instrumentation, blotting techniques and capillary electrophoresis for the diagnosis and management of inherited genetic conditions, neoplastic disease and infectious disease.

The department employs a team of experienced and skilled technical directors, a technical supervisor, research and development technologists, bench technologists and laboratory assistants who work closely to provide quality clinical test results in a timely manner. The foundation of the operation is a focus on laboratory-developed or "homebrew" testing with the intent to offer clinically relevant services to our patients when commercial products are not yet available. PAML's DNA sequence-based testing for the diagnosis of a neurodegenerative condition, Rett Syndrome (mutation in the MECP2 gene), for diagnosis of the most common genetic cause of deafness



Molecular Diagnostics Laboratory staff. Standing row, from left to right: Kristi Burkhart, Kathy Snyder, Brenna McMahill, Jennika Landon, Kari Hudson and Jennifer Elmore. Sitting row, from left to right: Matt Aakre, Todd Christensen, Carol-Lynn Rison, Amber Moss, Dr. Marcy Hoffmann and Dr. Danbin Xu.

(mutations in the GJB2 and GJB6 genes), and for management of patients with CRC (KRAS mutations), are examples of this philosophy at work.

Recent research and development efforts have been focused on new tests in the areas of women's health, molecular oncology and pharmacogenetics.

In early 2011, the lab is slated to begin offering carrier testing for spinal muscular atrophy, the second most common lethal autosomal recessive genetic condition behind cystic fibrosis. This test will be packaged with two other carrier screens commonly offered in the prenatal setting, including cystic fibrosis and fragile X syndrome.

The Molecular Diagnostics lab also has plans to develop a test for the BRAF V600E mutation, a companion test to KRAS mutation analysis, both used to guide the treatment of patients with CRC. Finally, the lab will be launching their first two pharmacogenetic tests in 2011. These tests focus on mutations which can occur in important enzymes responsible for drug metabolism. Mutations in enzymes belonging to the cytochrome P450 family can significantly impact an individual's ability to metabolize drugs; detecting these mutations can be helpful for determining optimal therapeutic dosage and avoiding drug toxicity. ❖

● INHERITED GENETIC CONDITIONS

- **Thrombophilia**
 1. **Factor V Leiden**
 2. **Factor II gene mutation (Prothrombin G20210A)**
 3. **MTHFR**
- **Cystic fibrosis**
- **Connexin 26 and 30 for autosomal recessive nonsyndromic deafness**
- **Hereditary Hemochromatosis (C282Y, H63D, and S65C mutations)**
- **Fragile X Syndrome, carrier and diagnostic studies**
- **MECP2 sequence analysis for Rett Syndrome**
- **Spinal muscular atrophy, diagnostic study**

● NEOPLASTIC DISEASE

- **BCR/ABL for CML and ALL**
- **JAK2 V617F for diagnosis of myeloproliferative disorders**
- **KRAS for management of metastatic colorectal cancer**

● INFECTIOUS DISEASE

- **Bordetella pertussis**
- **HPV DNA screen**
- **HPV Genotype**
- **VZV**

New tests in early 2011:

- Spinal muscular atrophy, carrier study
- P450 2D6
- HIV Genotype for drug resistance

Cytochrome P450 2D6 Genotyping

The cytochrome P450 2D6 (CYP2D6) is a highly polymorphic liver enzyme involved with the metabolism of many commonly prescribed drugs, including some antidepressants, antipsychotics, antiarrhythmics, antiemetics, beta-blockers, opioids, and selective estrogen receptor modulators (Tamoxifen). Genetic variation in the *CYP2D6* gene is common in most ethnic groups and can affect enzyme function and therapeutic responses to the drugs. Certain variants completely abolish the enzymatic function of CYP2D6; other variants partially disrupt its activity. Therefore, four distinct groups of metabolizers (poor, intermediate, extensive, and ultrarapid) have been defined based on the combination of different alleles of *CYP2D6* gene (Table 1).

Table 1. Characteristic overview of the CYP2D6 Metabolizer Groups

Metabolizer Groups	CYP2D6 Activity	Clinical Impacts	Frequencies in Caucasians
Extensive	Normal	None	85% to 90%
Intermediate	Close to normal	None or very little	85% to 90%
Poor	None	Could be significant, depending on the drugs used (see below)	5% to 10%
Ultrarapid	Increased	Could be significant, depending on the drugs used (see below)	5%

Poor metabolizers (PM) have no CYP2D6 activity:

- PMs are unlikely to achieve therapeutic response if the drugs they take require CYP2D6 to produce active metabolites for their function.
 - For example, Tamoxifen is metabolized by CYP2D6 into an active form that has a much higher affinity for the estrogen receptor than Tamoxifen. Individuals who are CYP2D6 PMs may have decreased levels of the active metabolite and thus may not derive as much benefit from Tamoxifen therapy as other patients do and, thus, have a higher risk of breast cancer relapse.
- PMs are likely to experience drug-induced adverse reactions with conventional doses of drugs requiring CYP2D6 for metabolism and clearance, such as SSRI antidepressant (Prozac, Zoloft, Paxil, etc.), some antipsychotics (Abilify, Haldol, etc.), and Strattera for the treatment of ADHD.

Therapeutic drug monitoring is recommended for PMs to confirm that steady-state drug concentrations are within the targeted therapeutic interval.

Ultrarapid metabolizers (UM) have increased enzyme activity due to CYP2D6 gene duplications:

- Opposite to PMs, UMs are at increased risk of therapeutic failure due to accelerated drug elimination.
- For drugs requiring CYP2D6 to produce active therapeutic drugs, UMs may also be at increased risk of adverse reactions due to increased exposure to active drug metabolites. ❖

New PAML Tests

TEST CODE	TEST	RELEASE
RNAISO	RNA Isolation and Storage	JAN 2011
SMACS	Spinal Muscular Atrophy Carrier Testing (SMA)	JAN 2011
VTB1B	Vitamin B-1, Whole Blood	JAN 2011



Article by Danbin Xu, MD, PhD
Co-Director of the PAML
Molecular Diagnostics Laboratory

Genotyping of *CYP2D6* gene is the most straightforward approach to identifying the poor metabolizers or ultrarapid metabolizers who may experience adverse drug reactions with conventional doses of certain medications. Optimizing a patient's medication dosage based upon the knowledge of their CYP2D6 enzyme activity, and considering other conditions, such as age, weight, liver and kidney function, and co-administrated medication, will help ensure the best drug responses and avoid severe adverse reactions.

CYP2D6 genotyping offered by PAML targets 17 genetic variants in *CYP2D6* gene plus two major gene rearrangements. This mutation panel identifies about 95% of variants responsible for poor metabolism and has an analytical sensitivity and specificity close to 100%. The assay is cost effective due to its multiplex PCR format.

**The test will be clinically available in February 2011.
Order Code: CYP2D6.**

Shipping dangerous goods and hazardous materials

The past few years have seen many changes to regulations involving the shipment of infectious substances and diagnostic specimens. In the spirit of continuous process improvement, the PAML logistics team has recently made several procedural changes related to the shipment of Dangerous Goods/Hazardous Materials.

To begin with, the team has increased the visibility of shipping information on the PAML website (www.paml.com). Hospital clients can now find a "Shipping" header below the "Quick Links" header on the Home Page. Under the header are links that take the client directly to the Shipping Guide, Shipping Manifest and Shipper's Declaration of Dangerous Goods Form.

The Shipper's Declaration for Dangerous Goods Form, which needs to be used whenever a client is shipping specimens that are categorized as dangerous or hazardous, can be either filled out online or downloaded easily to be sent with the specimens. The form has also been updated to meet current regulatory requirements and is now in a more user-friendly format.

To ensure that the Logistics Department is maintaining regulatory compliance, the team has implemented a new internal auditing program. Utilizing the Audit Tracker tool, which is part of their shipment tracker software, PAML will now be auditing every shipping lane once a week to make sure that everything pertaining to labeling on the outside of the box and all Dangerous Goods (DG) paperwork is being completed correctly.



The logistics team, working in conjunction with the accessioning team, has implemented a new procedural process in which the logistics group focuses on the outside of the boxes and the Accessioning group focuses on the inside of the boxes.

Working with the Supply team, the Logistics and Referral Testing teams have also put together a new kit for hospital staff to use when shipping 602 specimens to PAML. The "602 (Category A) Canister Kit" is a user friendly system offering a complete package to which you only need to add the primary container with the specimen to be tested. The PAML Part number for the kit is 1789K. The kit contains the following items:

1. Exakt-Pak Canister Kit (includes outer box, internal canister with 5 hole foam liner, absorbent, plastic bag and DG Label)
2. 4 sheets of redbar/hazmat blank form paper
3. 1 pre-printed FedEx Airway Bill

The shipper will be able to fill out the Shipper's Declaration of Dangerous Goods Form online and print to the redbar paper via a laser printer.

For more information about proper packing and labeling of dangerous goods, please contact your marketing representative or the PAML Logistics Department at (509) 755-8125. ❖

What's New, What's Changed and Why Should You Care?

Date:	February 8, 2011
Time:	12:30 p.m.-1:30 p.m. (PST)
Presenter:	Marguerite Busch
Duration:	60 minutes



**Marguerite Busch
BS, MT(ASCP), MA**

PAML's VP/Chief Compliance Officer, Marguerite Busch, also serves as the HIPAA Privacy and Security Officer and Director of Risk Management for PAML. She ensures that PAML and all of its joint ventures are in full compliance with industry regulations. She also works with PAML's legal counsel and insurance carriers on any patient safety or other risk issues. Accredited as an MT by ASCP, Marguerite holds a bachelor's degree in Medical Technology and a master's degree in Organizational Leadership from Gonzaga University.

LEARNING OBJECTIVES:

1. Describe new compliance-related requirements for laboratories.
2. Identify changes to HIPAA that have laboratory implications.
3. Develop tools to monitor compliance with regulatory requirements.
4. Discuss the final rule on Physician Signature requirements for laboratory requisitions and how it will impact clinical laboratories.

CREDITS:

The program has been approved for 1.0 contact hour through PAML which is approved as a provider of continuing education programs in the clinical laboratory sciences by the American Society for Clinical Laboratory Sciences (ASCLS) P.A.C.E® Program.

are nasopharyngeal swabs or nasal aspirates/washes that are collected within 4 weeks post-cough onset and prior to antibiotic treatment. PCR detects both live and dead bacteria and is NOT a test of active disease and cannot be used as a test of cure.

Bordetella pertussis lives in the nasopharynx, not in the nares. It binds to the ciliated epithelial cells of the respiratory tract—cells that are found in the nasopharynx but not in the human mouth or throat.



Access to the nasopharyngeal area can only be achieved with a narrow, fine-tipped dacron, rayon or polyester swab on a flexible plastic or wire shaft or by collecting a nasopharyngeal aspirate or wash.

Collect two NP swabs (Dacron or rayon tip with flexible plastic or wire shaft) by inserting the swab through the nose into the posterior nasopharynx and rotate for at least 5 seconds OR collect 1 mL nasopharyngeal wash. Place swabs or wash in M6 viral transport media.

Store at 4C upon receipt, but do not freeze. Specimens should be shipped as soon as possible after collection. Ship in one of PAML's 650 boxes; specimen type is required on the box.

Results of PCR tests are available on the day of test completion, usually within 1 to 3 working days of receipt of sample, and can be accessed via the secure web page for results.

NOTE: Do Not Use Calcium Alginate Swabs. Calcium alginate is a well known inhibitor of PCR, the chemistry used in the lab test to amplify and detect *Bordetella pertussis* DNA. Choosing the incorrect swab composition may yield a failure to amplify *Bordetella pertussis* DNA and an indeterminate test result. ❖



Physician signature rule

continued from page 1

“nonpatient” or “outreach patient” testing (when a hospital laboratory accepts patient test requests from outside the hospital e.g. physician offices, clinics, long term care facilities, etc.)

Some of the details of this new rule are:

- The rule does not apply to electronic or telephonic requests, only paper requisitions.
- A pre-printed signature or letterhead does not meet the requirements.
- A requisition is “the actual paperwork, such as a form, that is provided to a clinical diagnostic laboratory that identifies the tests to be performed.” According to CMS, it is “ministerial in nature” assisting laboratories with the billing and handling of results, and services as an administrative convenience to providers and patients.
- The signature should be sufficient for a laboratory to verify that the physician is requesting a test.
- With regard to confusion about “orders” vs. “requisitions,” CMS states that an order is a communication requesting a laboratory test and may be by written document, telephone or electronic mail or other electronic means. Requisition is defined as noted above. However, the requisition and order are two different documents, although a requisition that is signed may serve as an order.
- It is currently unclear as to whether the laboratory can go back to the ordering provider to obtain a signature if the requisition comes in unsigned. It is hoped that CMS will clear this up prior to enforcement.

If you have further questions, you may contact Marguerite Busch, PAML's VP/Chief Compliance Officer, by e-mail at mbusch@paml.com or by telephone at 509-755-8799. The entire Final Rule can be found at <http://www.ofr.gov/inspection.aspx>. ❖

Test Review

Spinal Muscular Atrophy (SMA) Carrier Screen

Order Code: SMACS

- Carrier screening for spinal muscular atrophy (SMA), the most common inherited cause of early childhood death, is now available from PAML.
- SMA is a severe, progressive neuromuscular disease characterized by proximal muscle weakness and eventual paralysis. It is the second most common autosomal recessive disorder behind cystic fibrosis.
- SMA is found in all populations, regardless of ethnic background with a prevalence of 1 in 10,000 live births. Carrier frequency is between 1 in 40 and 1 in 60.
- The American College of Medical Genetics recommends that SMA carrier screening be offered to all couples prior to conception or early in the pregnancy to allow the couple to make informed reproductive decisions.
- PAML's SMA screen identifies about 90% of carriers.
- SMA carrier screening is not indicated for use as a diagnostic test. For disease diagnosis, order SMAPCR.
- Sample type is 5mL EDTA whole blood.

Asthma & ImmunoCAP's role in treatment

Asthma, a chronic inflammatory process of the airways that results in recurrent attacks of breathlessness and wheezing, poses a significant burden in health care costs, loss of productivity and reduced participation in life. In the U.S. alone, 20.5 million people—6.7% of adults and 8.5% of children—have been diagnosed with asthma.

Symptoms in affected individuals can vary in frequency and severity from person to person. Although asthma cannot be cured, proper diagnosis, treatment and patient education will result in good control and management. Unfortunately, asthma is often underdiagnosed and undertreated, placing significant limits on daily life. It can even be fatal when not managed properly.

The fundamental causes of asthma are not completely understood. The greatest risk factors for developing asthma are a combination of genetic predisposition with environmental exposure to inhaled substances, and particles that may provoke allergic reactions or irritate the airways. These include indoor and outdoor allergens, tobacco smoke, chemical irritants and air pollution.

Asthma and allergies are closely intertwined. An allergic reaction in the airways caused by natural exposure to allergens has been shown to lead to

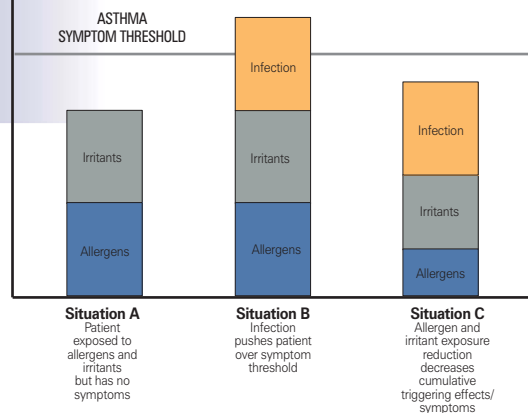
an increase in inflammatory reaction. Repeated exposure to allergens contributes to airway wall thickening, and the persistent underlying disease process drives irreversible tissue damage.

Studies show that indoor allergens from dust mites, cockroaches, dogs, cats, rodents, molds and fungi are among the most significant asthma triggers. Non-allergenic asthma triggers can include cold air, extreme emotional arousal (such as anger or fear) and physical exercise. Even certain medications can trigger asthma: aspirin and other non-steroid anti-inflammatory drugs and beta-blockers (which are used to treat high blood pressure, heart conditions and migraine). Failure to recognize and avoid these triggers that lead to a tightened airway can be life-threatening and may result in an asthma attack, respiratory distress and even death.

According to published literature, 60% of adult asthmatics and 90% of child asthmatics have allergic triggers. Recognizing the important role of allergy triggers in asthma, the National Heart, Lung, and Blood Institute (NIH), the World Health Organization and the Global Initiative for Asthma strongly recommend that all asthma patients be evaluated for allergies. Specifically, NIH recommends skin testing (*in vivo*) or specific IgE testing (*in vitro*) as the only reliable way to determine sensitivity to perennial indoor allergens for patients who have persistent asthma.

For patients sensitized to indoor allergens, environmental controls to avoid asthma triggers should be instituted. Knowledge of allergy triggers through allergy testing provides patients with the tools to practice effective avoidance, thereby reducing the cumulative allergen load which can help alleviate inflammation and the accompanying symptoms. It can also help prevent the loss of asthma control when exposed to respiratory pathogens.

The cumulative effect of asthma triggers



ImmunoCAP third-generation technology, capable of consistently measuring specific IgE antibodies with precision and accuracy, has proved to be superior to other assays. In clinical practice, *in vitro* methods such as ImmunoCAP for the detection of allergen-specific IgE in serum, offer these advantages when compared to *in vivo* tests:

- can be done for patients with extensive eczema.
- can be performed on patients taking medications that suppress the skin test.
- no risk of systemic reactions (anaphylaxis).

ImmunoCAP technology separates the U.S. into 19 separate regions – each focusing on the allergens of that region.

KEY POINTS

- Asthma and allergies are closely related.
- 60% of adult asthmatics and 90% of child asthmatics have allergic triggers.
- NIH recommends asthma patients be evaluated for allergies.
- Knowledge of allergen triggers helps patients practice effective avoidance, leading to more effective asthma control.
- ImmunoCAP technology measures specific IgE antibodies with precision and accuracy.
- PAML offers Respiratory Disease Profiles appropriate for each region of the U.S.
- Always order a Total IgE to provide a complete allergen picture.

NOTE: To provide a complete allergy picture, when ordering one of the region-appropriate Respiratory Disease Profiles, it is important to also order a Total IgE. ❖



PROVIDENCE HEALTH & SERVICES
CATHOLIC HEALTH INITIATIVES

110 W. Cliff Avenue
Spokane, WA 99204

Phone509.755.8600
Toll Free 800.541.7891
Fax 509.921.7119
Website www.paml.com

Please send comments/questions to
jnerud@paml.com