



Saint Luke's Regional Laboratories Clinical Laboratory Letter

July 2013

Preop Testing for Cotinine

More than 45 million Americans or 19% of the adult population still smoke tobacco. Tobacco smoke is a complex mixture of compounds including nicotine, carbon monoxide, tar, hydrogen cyanide, nitrogen oxides, N-nitrosamines, formaldehyde, and benzene. Nicotine is an addictive substance that causes individuals to continue using tobacco despite concerted efforts to quit. Smoking is a risk factor for cancer, cardiovascular disease, and pulmonary disease and is the leading cause of preventable death in the United States.

Smoking is also associated with adverse surgical outcomes including impaired wound healing, wound dehiscence, incisional hernia formation, surgical site infection and pulmonary complications. Several mechanisms are responsible for the detrimental effect of smoking on wound healing including vasoconstriction, tissue ischemia, thrombosis, reduced inflammatory response, impaired bactericidal activity and alterations of collagen metabolism. Tissue flaps, which have a fragile blood supply, are particularly vulnerable to these smoking-induced reductions in blood flow.

Studies have shown that patients tend to lie about smoking, with approximately 25% of self-reported nonsmokers testing positive for nicotine metabolites and 50% of smokers under-reporting the amount they smoke. Smoking can be detected by measurement of nicotine metabolites in a random urine specimen. Urine testing can also be used to monitor compliance of individuals engaged in smoking cessation programs.

CDC recommends that surgical patients stop smoking for 4 weeks prior to surgery. Plastic surgeons and some other specialties have begun testing patients for smoking who are at high risk for surgical complications. Typically, patients are tested during their initial office visit and instructed to quit smoking before surgery. They are retested on the day of surgery. Individuals who test positive may have their surgery canceled. Nicotine has a very short elimination half-life of 2 hours because it is rapidly metabolized in the liver

to cotinine. Cotinine can be detected in urine up to 3 days after nicotine use, using a detection cutoff of 200 ng/mL. Because of its longer window of detection, cotinine is the best biomarker of smoking. Saint Luke's Hospital will begin offering a rapid point of care test for urine cotinine in Main OR pre-op and Saint Luke's Neurological Institute pre-op on August 12. Testing will be performed by RNs and CNAs. The test is orderable in Clinicals as Cotinine, Urine (POC). Specimen requirement is a random urine collected on the day of surgery.

Surgery has requested that physicians inform the scheduler at the time of scheduling a case that they want their patient to be tested for cotinine preoperatively. Surgery wants to minimize disruptions that may occur if a case is cancelled because of a positive cotinine result. Quantitative confirmatory testing can be sent to a reference laboratory if needed.

HCV Quantitative New Version

Saint Luke's Molecular Diagnostics has performed Roche HCV viral load version 2.0 since October 2011. An upgrade to this assay has recently been implemented that necessitates a change in reporting at the lower limit. With the new version of the assay, the lower limit of detection (LOD) and lower limit of quantitation (LOQ) are the same at 15 IU/mL. Previously, the LOD was 15 IU/mL with an LOQ of 25 IU/mL.

Effective immediately, samples having HCV target detected, but below the quantifiable limit will be reported as '<15 IU/mL'. Samples having no HCV target detected will be reported as 'not detected.' Samples having detectable and quantifiable HCV target will continue to be reported as the numeric value up to or >50,000,000 IU/mL.

H3N2v Influenza Returns in Summer 2013

H3N2v influenza caused a twelve-state outbreak during the summer of 2012, totaling 309 cases with 16 hospitalizations and 1 fatality. Most cases were associated with exposure to pigs at

agricultural fairs. Infected pigs may spread influenza viruses even if they are not symptomatic. Limited person-to-person spread of this virus has been documented.

Influenza viruses that circulate in swine are called swine influenza viruses when isolated from swine, but are called variant viruses when isolated from humans. Influenza A H3N2 variant (H3N2v) viruses contain the matrix (M) gene from the 2009 H1N1 pandemic virus. This M gene appears to confer increased transmissibility to and among humans, compared to other variant influenza viruses.

The first cases of influenza A H3N2v virus infection this year were reported in June 2013 in Indiana. Genetic sequencing by CDC confirmed that these H3N2v viruses are nearly identical to those detected during summer 2012. Clinically, H3N2v resembles seasonal influenza, with fever, cough, pharyngitis, myalgia, and headache. As of July 5, none of the persons ill with 2013 H3N2v infection have been hospitalized or died.

Although rapid influenza antigen tests may detect H3N2v virus, a negative result does not exclude infection with H3N2v or any influenza virus. Additionally, a positive result for influenza A by rapid antigen does not confirm H3N2v virus infection, because these tests cannot differentiate subtypes. Saint Luke's Microbiology respiratory PCR is more sensitive than rapid antigen tests and differentiates the H3 subtype, but does not distinguish the swine variant from seasonal H3 influenza.

The CDC recommends that patients with suspected influenza and recent exposure to swine should have respiratory specimens collected for sub-type specific real-time polymerase chain reaction (RT-PCR). Specimen requirement is a nasopharyngeal swab or aspirate in viral transport medium. Testing will be forwarded to a state public health laboratory.

Drug Screen Specificity

The laboratories in the Saint Luke's Health System use a rapid immunoassay (Triage®, Biosite Inc) to screen for drugs of abuse in urine. The major problem with all rapid immunoassays is their less than perfect specificity for each drug class. Positive

drug screen results are confirmed by liquid chromatography/ tandem mass spectroscopy. Recently, all positive drug screen results reported in May were reviewed to determine the false positive rate.

	Amp	PCP	Coc	Opi	Thc	Bnz	Barb
#Pos	14	5	8	124	78	80	20
TP%	100	100	100	97	91	90	80
FP%	0	0	0	3	9	10	20

No false positives (FP) occurred for amphetamine, PCP or cocaine. Marijuana (THC), benzodiazepines and barbiturates had the highest number of false positive results. Interestingly, most of the false positive screening results occurred when 2 to 4 drugs were positive in the same specimen, suggesting some nonspecific interference in the screening assay.

Prescription drugs, over the counter medications and herbal supplements may also cause false positive screening results. False positive THC reactions are most commonly associated with Clozaril, Propulsid, Protonix, Paxil, Tegretol and Zocor. Over the counter remedies can produce false positive results in the phencyclidine and benzodiazepine assays. Herbal supplements containing ephedra may produce a positive amphetamine reaction, while ingestion of poppy seeds may produce a positive opiate reaction.

Bone Marrow Process Change

Saint Luke's Hospital Laboratory staff will provide technical assistance to physicians performing bone marrow aspirate procedures within the hospital, upon request, Monday-Friday from 7:00 am until 7:00 pm. Technical assistance outside these hours is generally not available, as the laboratory is primarily staffed to process only essential testing on nights, weekends and holidays.

Effective August 5, laboratory staff responsibility will transfer from Hematology to Molecular Diagnostics. Bone marrow assistance can be requested by calling 26602 and providing patient name, hospital location and date/time of procedure. A Bone Marrow Aspirate and Biopsy order form (SYS-1207) **must** be completed and received in the laboratory prior to the scheduled date. Staff will not be dispatched to assist without complete physician orders. Order forms can be faxed to Molecular Diagnostics at 26975.