



Pediatric Clips

What's New in Dayton Children's Microbiology and Virology Lab By Michael Brandon, BSMT (ASCP)

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Pediatric Clips from The Children's Medical Center of Dayton are quick reviews of common pediatric conditions.

The Children's Medical Center of Dayton is the region's pediatric referral center for a 20-county area. As the only facility in the region with a full-time commitment to pediatrics, Dayton Children's offers a wide range of services in general pediatrics as well as in 35 subspecialty areas for infants, children and teens. We welcome your inquiries about services available – call 937-641-3666 or e-mail marketing@childrensdayton.org.



Experts you trust, caring for the children you love.

STREPTOCOCCUS PNEUMONIA ANTIGEN TEST

Streptococcus pneumoniae is a leading cause of community acquired pneumonia (CAP). It affects persons of all ages but is common in children under 5 years of age, teenagers, young adults and the elderly.

The diagnosis can be difficult because less than one-third of patients produce sputum suitable for culture. Blood cultures are specific, but they may have a low positivity rate (10-20%). About 10% of pneumonia cases are associated with pleural effusion, although a pathogen is recovered in less than half of those persons who undergo diagnostic thoracentesis. Finally, one-third of patients with CAP have received antibiotics before the collection of cultures which decrease the yield by conventional microbiology methods.

Dayton Children's microbiology now offers a *Strep. pneumoniae* enzyme immunoassay (EIA) test which can be done on urine or cerebrospinal fluid. This test has been helpful in diagnosing several patients whose cultures are negative perhaps due to previous antibiotic therapy.

SHIGA-TOXIN ASSAY TEST

Not all Shiga toxin-producing *E. coli* are type O157:H7. For this reason the Centers for Disease Control (CDC) has recommended laboratories check for other toxin producing *E. coli* routinely. Dayton Children's now does broth enrichment with an enzyme immunoassay test specific for Shiga-like toxin 1 and 2. The assay has been added to all routine stool cultures. So far this assay has identified one patient with a non-O157:H7 Shiga toxin-inducing

E. coli. The isolate has been sent to the Ohio Department of Health (ODH) for further analysis. In addition several strains of *E. coli* O157 have been identified days earlier by using this assay compared to conventional culture methods.

NOROVIRUS BY POLYMERASE CHAIN REACTION

Norovirus (originally called Norwalk virus after an outbreak in Norwalk, Ohio in 1968) occurs year round. It is the most common cause of sporadic and outbreaks of acute gastroenteritis. Half of all food-related outbreaks are caused by this virus. It can cause waterborne outbreaks due to contaminated drinking water and recreational water that is contaminated. It can be found in stool and vomit (one of the few bacteria or virus that can be transmitted via vomit). It is highly contagious and can be transmitted two weeks or longer after recovery. A recent study found that a single Norovirus particle has a 50% chance of causing disease. It is hardy and can survive freezing as well as temperatures up to 60 degrees Celsius. In addition, it can survive concentrations of chlorine up to 10 ppm. Swimming pool standards are 2 to 4 ppm of chlorine. So, in addition to *Cryptosporidium*, Norovirus can be transmitted in treated drinking water as well as properly chlorinated swimming pools. A study by CDC suggested that an average of 0.14g of feces is carried into a pool by each swimmer. That translates into two to four pounds of feces per week in the average swimming venue in the United States.

Norovirus is not yet able to be grown in viral culture nor demonstrated using small animal models. Diagnosis

has been difficult until recently. Dayton Children's virology laboratory has validated a Polymerase Chain Reaction (PCR) for Norovirus. The test is performed every Monday, Wednesday and Friday. The specimen is stool in a clean container.

RAPID MRSA/MSSA DIRECT FROM BLOOD CULTURE BOTTLES

Dayton Children's can now identify MRSA and MSSA directly from blood culture bottles using PCR. The assay uses three targets: the *mec A* gene, SPA (*Staph. aureus* Protein A) and SCC (*Staph. cassette chromosome*), the plasmid that carries the *mec A* gene. Blood cultures that turn positive and display gram-positive cocci in clusters will be assayed for these three targets. A report of MRSA, MSSA or negative for both can be generated in hours and decreases the length of time for identification from days to hours. In addition, the laboratory will continue to do the usual identification and susceptibility testing of these bacteria.

ADVANCES IN REDUCING BLOOD CULTURE CONTAMINATION

Contaminated blood cultures can cause unnecessary treatment, additional follow-up visits, lab tests and increased length of hospitalization. Many years of work by staff is paying huge dividends in reducing contaminated blood cultures.

Dayton Children's now typically averages less than 1% contamination of blood cultures each month. A study by the College of American Pathologist Quality Probe found that Dayton Children's ranks in the top 10th percentile of 142 laboratories reporting data for contaminated blood cultures.

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BED BUGS MAKING A COME BACK

Bed bugs have been with humans since the beginning of civilization. The earliest mention in writing was in the second millennium BC. Aristophanes and Aristotle both noted bed bugs. Thanks to changes in living conditions and the proper use of modern pesticides such as DDT, by the 1960s bed bugs in the United States were nearly eliminated. Recently bed bugs have made a comeback in many cities including Louisville, Cincinnati, Columbus and recently (October 2008) the Dayton area.

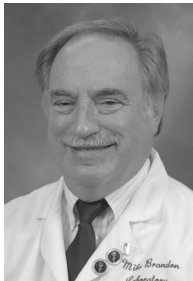
A Dayton Public School was recently closed when bed bugs were found near a student's backpack.

Bed bugs lay 200 to 500 eggs per adult female at a rate of 12 per day. An adult bed bug can live six to 12 months without a meal. They feed only on the blood of warm-blooded animals and can fully feed in three to 10 minutes. Their bite is nearly painless. They live in almost any crevice or protected location. Common places are box springs, bed frames, mattress seams, at the edge of wall-to-wall carpeting, electrical switch plates and outlets. Bed bug bites

can be found anywhere there is exposed skin whereas flea bites are generally found on the feet and ankles.

Don't bring the little buggers home with you by checking hotel rooms when you arrive. Look for their bloody feces in box springs and mattress seams. Hang your clothes on hangers rather than putting clothes in drawers. Keep your suitcase on a metal stand; do not leave it on the floor.

FEATURED SPECIALIST



MICHAEL BRANDON, BSMT (ASCP), has been the microbiology and virology supervisor at The Children's Medical Center of Dayton since 1976.

He is a graduate of Wright State University. Mr. Brandon completed his laboratory science internship at St. Elizabeth Medical Center in Dayton, where he was also an instructor in medical technology. He is currently program chairman and on the board for the South Central

Association for Clinical Microbiology. Mr. Brandon serves on various infectious diseases and safety committees at Dayton Children's. He was also recently given the Outstanding Contributor Award from the South Central Association for Clinical Microbiology.

LABORATORY SERVICES AT DAYTON CHILDREN'S

Dayton Children's laboratory offers pediatric expertise and cutting-edge technology, including an extensive PCR menu, with results often available same day or next day, and easy access to technical specialists who can help with interpretation of test results. For specimens

collected in your office, the laboratory outreach service provides continuity of care, convenience of a one-stop-shop for all your patients (of any age) and quick turnaround times. The outreach service offers a free courier service with convenient, flexible hours, and an extensive list of free specimen collection supplies. Dayton Children's is also home to the regional genetics center, which accepts referrals for evaluation, counseling or laboratory testing for patients of any age with personal or family history of birth defects or genetic disease. For more information on any of the services offered at Dayton Children's laboratory, contact Lisa Henderson, client services manager, at 937-641-3117.



For further information about The Children's Medical Center of Dayton or its specialists contact us at 937-641-3666 or marketing@childrensdayton.org.



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