Michigan Department of Community Health
MDCH
John Engler, Governor
James K. Haveman, Jr., Director

LabLink

Laboratory Information from the Michigan Department of Community Health - Bureau of Laboratories

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Haveman Names New Laboratory Director

Michigan Department of Community Health Director James Haveman, Jr. has announced that Frances Pouch Downes will serve as the new director of the Bureau of Laboratories. According to Haveman, "the laboratories are a fundamental part of the active commitment the Department of Community Health has to public health safety." Downes will be instrumental in continuing the laboratory's role in the health of the citizens of Michigan.

After receiving a doctorate in public health and a master of public health degree from the University of North Carolina, Downes came to MDCH in 1988 as the assistant chief in the microbiology section. In 1990, she moved into the virology section as the chief of the viral serology unit, later becoming the section chief of the virology section. In 1992, Downes left the department and spent three years as an independent consultant in Niamey, Niger, West Africa. Downes returned to the department in 1995 to serve as the managed care coordinator. Downes has served as the director of the Infectious Diseases Division within the Bureau of Laboratories since 1997.

Downes also currently an adjunct professor in the Medical Technology Department and International Health Program at Michigan State University. She has published numerous papers and is currently the co-editor of the *Compendium of Methods for the Microbiologic Examination of Foods*, 4th Edition, for the American Public Health Association.

Downes lives in East Lansing with her husband, who is a hospital administrator, and three children.

From the Lab Director

Over the past several years I have had the opportunity to write and edit the Lab Link. This is the first issue that I have the opportunity to write as the laboratory director. While I am not new to the laboratory community in Michigan, this role is certainly new to me. I am both honored and humbled by the leadership role for which I have been selected. Certainly my job is made easier by the strength of the current MDCH laboratory staff and the foresight of previous public health leadership in Michigan who laid a strong foundation for this laboratory program.

This is an era of evolving roles for public health and clinical laboratories. And, like all times of change, it is both exhilarating and frightening. During the next months and years, public health laboratories will examine their role in an emerging national public health laboratory system. While the details of the system architecture have not been fully described, the system will further promote the linkages between clinical laboratories and public health laboratories and surveillance systems. Coordinated responses to evolving testing issues like emerging infectious diseases, genetic testing, quality assessment and bioterrorism will be fostered by this system. The partnership between clinical and public health laboratories will be increasingly important in the construction of this network. I look forward to engaging you, our laboratory partners, in this change process.

Frances Pouch Downes, Dr. P.H.

Rabies: The Real Truth About Bats

Patty Clark, M.P.H.
Viral Serology/Viral Isolation Unit

Rabies is a fatal, infectious viral disease of the central nervous system to which humans and warm-blooded animals are susceptible. Virus is present in the saliva of rabid animals and transmitted only when introduced into bite wounds open cuts in skin or onto mucous membranes. All bites, regardless of location, represent a potential risk of rabies transmission. Bites by some animals, such as bats, can inflict minor injury and thus be undetected.

There has been a marked decrease of rabies cases among domestic animals in the United States as pet vaccination and stray animal control programs of the 1940s and 1950s eliminated dogs as a reservoir for rabies virus. In 1950, 4979 cases of rabies were reported among dogs. Between 1980 and 1997, 95-247 cases were reported each year among dogs.[1] Thus, the likelihood of human exposure to a rabid dog in the United States has decreased greatly.

In this same time span, rabies among wildlife has become more prevalent, accounting for more than 85% of all reported cases of animal rabies every year since 1976.[1] Rabies among wildlife occurs throughout the continental U.S. Wildlife is now the most important potential source of infection for humans and domestic animals in the U.S. This increase of cases in wild animals has been attributed to expanding human populations in urban and suburban areas, encroaching into recently forested or agricultural land where wild animal populations were also expanding in response to changing agricultural practices, land usage, and a diminished fur trade.[2]

Because of this shift in rabies from domestic animals to wildlife, the risk of human exposure to rabies has changed little in the last 60 years. The number of human cases has declined over this period because of the introduction of human rabies immune globulin and more potent rabies vaccines (not because the virus has been eradicated). Every year 16,000 to 39,000 persons receive postexposure prophylaxis.[1] The Centers for Disease Control and Prevention (CDC) estimates the annual cost for rabies control programs in the United States to be more than $300 million and rising.[2]

Rabid bats have been documented in the 49 continental states and are increasingly implicated as important wildlife reservoirs for variants of rabies virus transmitted to humans.[1] Although bats are responsible for a relatively small portion of animal rabies cases in the U.S. (approximately 10% of cases annually [2]), bat rabies variants are associated with a disproportionate number of human rabies infections. Of 24 human rabies infections acquired in the U.S. since 1981, 21 infections were associated with bat variants.[2] A likely explanation for this is that a bite from a carnivore is likely to be noticed by the victim who will then seek postexposure prophylaxis, whereas a puncture wound produced by the small, sharp teeth of a bat may not be as obvious. Consequently, postexposure prophylaxis should be considered when direct contact between a human and a bat has occurred.[1]

In January 1999, CDC revised their recommendations on human rabies prevention. CDC recommends that human and domestic animal contact with bats should be minimized. Bats should never be handled by untrained and unvaccinated persons, and they should not be kept as pets. In all instances of potential human exposures involving bats, the bat in question should be safely collected and submitted for rabies diagnosis.

Of the 21 bat-associated cases of human rabies reported since 1980, a bite was reported only in 1-2 cases. In 10-12 cases, apparent contact occurred but no bite was detected. In 7-10 cases, no exposure to bats was reported, but an undetected or unreported bat bite remains the most plausible hypothesis.[1] Consequently, CDC recommends considering postexposure prophylaxis when direct contact between a human and a bat has occurred, unless the exposed person can be certain a bite, scratch, or mucous membrane exposure did not occur or the bat has been found to be negative upon testing.

CDC has also amended its recommendations with regard to ferrets. On the basis of new information on rabies pathogenesis and viral shedding patterns in ferrets, ferrets are now considered in the category with dogs and cats rather than as wild carnivores. Therefore, a healthy ferret that bites a person may be confined and observed for 10 days. Any illness in the animal during confinement should be evaluated by a veterinarian and reported immediately to the local health department. If the ferret does become ill, it should be euthanized and submitted for rabies testing. A currently vaccinated ferret is unlikely to become infected with rabies.[1]

Small rodents such as squirrels, chipmunks, rats, mice and lagomorphs (rabbits and hares) are almost never found to be infected with rabies and have not been known to transmit rabies to humans. These are considered to be non-suspect animals and are not routinely tested by the MDCH laboratory.

MDCH has an active rabies testing unit. On average, the lab tests approximately 2500 samples per year. Suspect animals in Michigan include bats, skunks, fox, cats and dogs. Bats are the most likely to be found positive for rabies. In 1998, 2185 samples were submitted to the MDCH laboratory for rabies testing, 481 (22.0%) of which were bats, with 33 (6.8% of all bats submitted) of these being positive. This compares with 645 (29.52%) dogs with none positive, 707 (32.36%) cats with none positive, 31 (1.42%) skunks with 2 (6.45% of all skunks submitted) positive and 9 (0.4%) fox with none positive.

References

1. CDC. Human Rabies Prevention - United States, 1999 Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR January 8, 1999; 48(RR-1): 1-21.
2. Smith, J. Rabies. Clinical Microbiology Newsletter. February 1, 1999; 21(3): 17-23.

THE REGIONAL LABORATORY SYSTEM

Kalamazoo County Regional Lab

Cindy Overkamp, Laboratory Manager

A cooperative agreement between the state and local health departments in Michigan was launched in 1990 to strengthen our public health programs. MDCH bureau of laboratories developed the regional laboratory system and provides experienced laboratory directors and technical consultants to help local health departments comply with Clinical Laboratory Improvement Amendments of 1988 (CLIA' 88) and EPA federal regulations. With administrative staff provided, counties could meet federal requirements and continue offering lab tests onsite for their programs, e.g., WIC, Family Planning, and health screening clinics. To date, 73 counties have joined the regional laboratory system. Of the seven counties that declined, two do not perform onsite testing. Each of the five regions in the state has its own laboratory director, technical consultant and CLIA'88 certificate.

The goals of the regional laboratory system and committee have been to develop standardized testing methods, ensure uniform quality assurance practices, to serve as an expert testing, training and consultative resource and offer quality testing closer to the counties served. The committee also evaluates public health issues such as foodborne outbreaks, water testing, and bio-terrorism.

The five laboratories that comprise the regional laboratory system in Michigan will be featured in upcoming editions of *LabLink*. Kalamazoo County Regional Lab (Region III) is highlighted in this issue. Region III consists of the counties of Kalamazoo, Berrien, Cass, Barry, Eaton, VanBuren, Hillsdale, St. Joseph and Branch. More than 57,000 clinical and environmental tests and procedures are performed annually at the Kalamazoo regional lab for these counties, three Planned Parenthood agencies and the counties of Allegan and Calhoun.

The Kalamazoo laboratory is a division of the Environmental Health and Laboratory Services Bureau of the Kalamazoo County Human Services Department and is managed by Cindy Overkamp. Patrick Krause is the bureau director and Dr. Frances Pouch Downes, of MDCH acts as the laboratory director. The staff consists of four medical technologists, two laboratory technicians and one secretary.

Overkamp and Downes meet with site coordinators in each county in their region and convene as a region in Kalamazoo twice a year. They concentrate on quality assurance concepts and offer guidance, education and training. Together they have held hands-on and train-the-trainer seminars at the Kalamazoo facility to strengthen the quality of testing, ensure procedural standards and affirm competency of testing personnel within Region III.

The regional laboratory system is a mutually beneficial arrangement for the local county health departments and the communities and citizens served. Public health programs throughout Michigan are strengthened through appropriate and improved testing quality, an improved service delivery and the affiliation with public health professionals in the regional laboratory system.

NEW EMPLOYEES AND PROMOTIONS

MDCH and the Bureau of Laboratories would like to welcome two new employees. Anne Clark joins the newborn screening section, coming to the department from BioPort. Also joining the labs from BioPort is Sharon Anzaldua, who now works in the molecular biology section. Congratulations on two promotions. Pat Garrod has moved to a position in virology from newborn screening. Marilyn Boucher in the newborn screening section recently received a promotion.

Active Influenza Surveillance in Michigan 1999-2000

Sally A. Bidol, MPH
Bureau of Epidemiology

The Michigan Department of Community Health (MDCH) will soon begin active influenza surveillance for the 1999-2000 season. Surveillance activities will again target the months of October-May. This is the third consecutive year MDCH will coordinate active influenza surveillance in Michigan, as part of a national monitoring effort lead by the Centers for Disease Control and Prevention (CDC). These activities serve to track both the severity of influenza levels and diversity of influenza viruses isolated. The latter is key to evaluating vaccine match with circulating virus, as well as early recognition of influenza strains that could pose a pandemic threat.

The active surveillance system has two facets:

- The MDCH Bureau of Epidemiology has established a sentinel network of medical providers throughout Michigan. Sentinel practitioners report influenza-like diagnoses directly to the CDC on a weekly basis. More than 25 providers are currently enrolled in the network, representing the majority of geographic regions in the state. Practice types consist of pediatric and adult primary care, urgent care, university health care and nursing homes. These selected settings are likely to have patients presenting with symptoms of influenza-like illness. This year, we hope to expand and improve the sentinel network by recruiting participants from additional localities. We also wish to include several key health settings in urban areas of southeast Michigan and to enroll more long-term care facilities.

As an additional indicator of influenza-like activity, we conduct routine checks with a sample of clinical laboratories in Michigan. These are both hospital-based laboratories and corporate laboratories which provide viral isolation services. They are polled weekly for the number of respiratory isolates they receive and specific viruses identified.

- The MDCH Bureau of Laboratories performs culture and subtyping of respiratory specimens submitted from the sentinel network. Sentinel physicians collect specimens from persons with influenza-like illness at the start, mid-point, and close of the surveillance season. These sentinel specimens are also tested for respiratory syncytial virus (RSV), adenovirus and parainfluenza.

  Clinical laboratories that isolate suspect influenza virus may forward these specimens to MDCH for confirmation and typing. In addition, we provide local health departments with specimen collection kits and laboratory testing support for investigation of suspected outbreaks of influenza in their communities.

The contact person within the Bureau of Laboratories for questions related to laboratory testing and specimen transport is Patricia Clark, MPH, Viral Isolation Unit, at 517-335-8102.

The contact person within the Bureau of Epidemiology for information on state and national influenza surveillance data, and for reporting outbreaks, is Sally A. Bidol, MPH, Epidemiology Section, at 517-335-8165.

New EIS Officer Arrives

Melinda Wilkins, D.V.M., MPH, a federally assigned Epidemic Intelligence Service Officer, arrived in late July to begin her two-year training assignment at the MDCH. Wilkins will start her practical experience by participating in two projects, the national Rotavirus vaccine intestinal intussusception study and an evaluation of our Michigan Salmonellosis surveillance system.

Wilkins is a Michigan native, growing up in Tecumseh. She attended Michigan State University and graduated from the MSU College of Veterinary Medicine 1994, concentrating in large animal medicine and public health. She received her master of public health degree from the University of Illinois in 1999. She comes to us from a position in Illinois with the US Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services.

Quirky Bugs...

Vibrio vulnificus

Steve Haskell, B.S., SM(ASCP)
Reference Bacteriology Unit

Recently a male patient in Detroit became sick and died in an area hospital after returning from a trip to Arizona where he had eaten raw oysters. Blood cultures were collected and tested at the Detroit area hospital. The hospital laboratory isolated and identified an organism (a Gram negative rod) as *Vibrio vulnificus*. This organism was submitted to the MDCH laboratory for confirmation and for genetic fingerprinting.

In 1976, Hollis described a bacterium with properties similar to *Vibrio parahaemolyticus* and *Vibrio alginolyticus*, except it fermented lactose. This lactose-positive organism was initially given the name *Beneckea vulnifica*. However, its placement into the genus *Beneckea* was never widely accepted. Today the organism is classified in the genus *Vibrio* and is known universally as *Vibrio vulnificus*. A halophilic Vibrio species, *V. vulnificus* exists in the marine environments of the Gulf of Mexico, and along both the Atlantic and Pacific coasts of North America. It has been associated with two types of disease, septicemia and wound infection. The isolation of this organism is very rare in Michigan. When *V. vulnificus* has been isolated in Michigan it has usually been related to contaminated food consumption.

V. vulnificus causes a life-threatening septicemia with a fatality rate close to 50 percent. Most individuals developing primary septicemia have pre-existing liver disease or are immunocompromised. Healthy individuals may also become infected. Most often the disease begins a few days after eating contaminated raw oysters. The patient develops a malaise which progresses rapidly to fever, chills, prostration, severe hypotension and often death. The progression may only take 24 hours from an asymptomatic condition to death. The drug of choice for the treatment appears to be tetracycline and aminoglycosides.

Serious wound infections may also be caused by *V. vulnificus*. The source of infection is marine animals or exposure to a marine environment after a trauma to the body. Individuals with *V. vulnificus* wound infections have a mortality rate of about seven percent. The disease progresses rapidly with swelling, erythema followed by the development of bullae and vesicles which may lead to tissue necrosis. Symptoms also include fever and chills. Surgical intervention, including amputation, is often required and antibiotic treatment with tetracycline is needed.

V. vulnificus grows on blood agar and forms green or, less often, yellow colonies (10%) on TCBS agar. Commercial blood culture bottles will support growth but the sub-optimal sodium content may cause cells to be aberrant in size and shape. It is a salt dependent, lysine decarboxyl (LDC) positive and arginine dehydrogenase (ADH) negative organism. Tests for the differentiation of this species from other Vibrio species in this group include ability to ferment lactose, salicin and cellobiose, a negative Voges-Proskauer reaction, L- arabinose fermentation negative and resistance to colistin.

Because infections caused by *V. vulnificus* are usually foodborne and the natural contamination of oysters is unavoidable, measures must be taken to assure that seafood is safe for consumption. Measures for the prevention of the spread of infection include cooking food to kill Vibrios, followed by proper handling and storage. Those at highest risk for serious disease should be informed of the risk of eating raw oysters.

The Detroit Medical Center microbiology laboratory initially identified this organism and sent it to MDCH for confirmation. Good job to all in the laboratory at DMC!