In this Issue

**Aeromonas hydrophila - an overview**

**Leeches may transmit antibiotic-resistant Aeromonas hydrophila**

**CDC to track antibiotic use by hospitals**

**Ventilator-associated pneumonias (VAP) - do oral antiseptics help?**

**The "Black Death" today**

**Does immunization of employees reduce influenza outbreaks in long-term care facilities?**

**Mycobacterium porcinum isolated from public water supplies**

**Rotavirus vaccine for children - benefits far exceed risks**

**Bacteria found in mouth may be related to pneumonia risk**

**U.S. Senate acts to promote the development of antibiotics**

**Copper covering may reduce infection rates in hospitals**

**Federal agency to award $34 million to fight healthcare-associated infections**

**Should scrubs be washed at home?**

**Anisakiasis**

---

**We’d Like to Hear from You**

The vast majority of feature articles that appear in our *Infectious Disease Update* come about because somebody asked for them.

Often at meetings or during informal conversations, somebody will say: “Why don’t you write something about this particular subject?” Invariably, if it’s important enough for one person to be interested in it, then there’s an excellent chance that additional readers would like to hear about that subject.

Additionally, you might come across an article in a journal that you feel should be brought to the attention of other professionals. Just let us know the name of the journal, the volume, the month, and the page and we’ll try to include it in a forthcoming issue.

To contact the Editor, just click [here](#).

---

**Aeromonas Hydrophila - An Overview**

**The Genus Aeromonas**

Members of the genus *Aeromonas* are small, gram-negative rods with rounder ends. Their size ranges from 1.0 to 3.5 μm in length and 0.3 to 1.0 μm in diameter. They are motile with polar flagella and grow at temperatures as low as 4°C.

Depending upon which reference one reads, there are from six to 15 species in this genus. Only three though are considered as potential pathogens. *A. hydrophila* is most often associated with infections in humans. *Aeromonas caviae* and *Aeromonas sobria* are occasionally associated with cases of human disease.

---

![Gram stain of Aeromonas hydrophila](https://example.com/gram-stain.jpg)

*Courtesy of CDC*
Habitat of Aeromonas hydrophila

A. hydrophila is found in aquatic environments worldwide. It can also survive in chlorinated water, bottled water and well water. It can also be recovered from many foods. A small number of humans have been shown to be colonized with this organism.

Aeromonas hydrophila as a Pathogen

A. hydrophila has been known to be a pathogen of warm- and cold-blooded animals since 1892. It is particularly important as a pathogen of fish and reptiles. In fish, it can cause tail and fin rot, scale protrusion disease, ulcers and hemorrhagic septicemia.

Hemorrhages and ulcers on the American shad

Aeromonas hydrophila and motile Aeromonad Septicemias of Fish


It has been recognized since 1968 as a potential pathogen of humans causing gastroenteritis, soft tissue infections and septicemias.

Ulcer on koi caused by A. hydrophila

Courtesy of the American Fisheries Society

A leg infected with A. hydrophila (ecthyma gangrenosum)

Courtesy of Medscape

Its role as a human pathogen is still under debate. High numbers of A. hydrophila have been fed to healthy volunteers with no development of gastroenteritis. On the other hand, it is often isolated from patients with gastroenteritis with no other apparent GI pathogen present. In the case of wounds and septicemias, its pathogenic role is not in dispute. Patients with soft tissue infections usually have had an injury outdoors and were exposed to potentially contaminated water and/or soil.
**Treatment**
Most strains of *A. hydrophila* exhibit resistance to the penicillins, ampicillins and cephalosporins. Most isolates are susceptible to chloramphenicol, the tetracyclines and the aminoglycosides though susceptibility to the later group varies.

**Laboratory Diagnosis**
*A. hydrophila* can often be isolated from routine plating media conventionally used for stool cultures. However, for best results, blood agar to which ampicillin has been added and CIN agar should be used. CIN agar is intended for the isolation of *Yersinia enterocolitica* from clinical specimens and contains cefsulodin, irgasan and novobiocin to inhibit the growth of other microorganisms. As luck will have it, *A. hydrophila* grows well on this agar and is often isolated from it.

**Infection Control Practices**
Persons should avoid using or recreating in water that may be a source of *A. hydrophila*. Wounds that are acquired around these waters or wet soils should receive prompt medical attention.

William F. Vincent, Ph.D.
Quest Diagnostics
Wallingford, CT

**Selected References**

The Bacterial Diseases. 2010. *Aeromonas hydrophila*. Click here to access article.

U.S. Food and Drug Administration. 2009. Bad Bug Book - *Aeromonas hydrophila*. Click here to access complete article.


---

**Want to Contact A Quest Diagnostics Representative?**
If you would like a Quest Diagnostics representative to call on your office or facility, you can use the links below to arrange for such a visit.

For a physician representative, click here.

For a hospital representative, click here.

---

**Other Infectious Disease News**

**Leeches may transmit Antibiotic-resistant *Aeromonas hydrophila***
Yes, leeches are still used on occasion for medicinal purposes. Unfortunately, since it comes from fresh water, *Hirudo medicinalis* can be a source of *Aeromonas hydrophila* infection. Depending on the original source, it is estimated that seven to 20 % of leeches have *Aeromonas hydrophila* in their gut.

Mouth of *Hirudo medicinalis*, the medicinal leech
Courtesy of National Museum of Natural Science

It has been the practice to give prophylactic antibiotics in order to prevent infections when using leeches. The problem now, however, is the emergence of antibiotic-resistant *A. hydrophila* which may necessitate the use of combinations of antibiotics to prevent infection.

CDC Now Tracking Antibiotic Use in Hospitals
“Get Smart About Antibiotics Week” 2011
Spotlights Importance of Appropriate Antibiotic Use

Press release (verbatim) dated November 14, 2011
The Centers for Disease Control and Prevention is launching a new antibiotic tracking system allowing hospitals to monitor antibiotic use electronically, make better decisions about how to improve use, and compare themselves to other hospitals. Before now, CDC was only able to track antibiotic use in doctors’ offices.

Each year, millions of Americans take antibiotics to fight infections. But overuse and misuse of antibiotics can change germs, allowing them to evolve resistance to antibiotics, which increases the risk of an infection for which there are limited or no treatment options. Patients who receive antibiotics can experience side effects, including allergic reactions and may be at increased risk for Clostridium difficile infection, a potentially deadly diarrheal infection.

“Antibiotic use leads to antibiotic resistance, which is a major public health problem,” said CDC Director Thomas R. Frieden, M.D., M.P.H. “Hospitals and other health care facilities should monitor the antibiotics used in their facilities. This new system is a powerful tool that will enhance providers’ ability to monitor and improve patterns of antibiotic use so that these essential drugs will still be effective in the years to come.”

The antibiotic use tracking system is part of CDC’s National Healthcare Safety Network, the nation’s premier tool for monitoring infections in health care facilities, which includes over 4,800 hospitals. CDC has funded four health departments and their academic partners to implement the tracking system in 70 hospitals. In addition, any hospital that participates in the National Healthcare Safety Network can utilize this tool by working directly with its pharmacy software vendor to transmit data electronically from drug administration or bar-coding records. There is no manual entry of data, thus saving a facility time and money.

“The threat of untreatable infections is real,” says Arjun Srinivasan, M.D., who heads CDC’s Get Smart for Healthcare program. “Although previously unthinkable, the day when antibiotics don’t work in all situations is upon us. We are already seeing germs that are stronger than any antibiotics we have to treat them, including some infections in health care settings.”

CDC has implemented multiple strategies to address antibiotic use, including Get Smart About Antibiotics Week (Nov. 14-20, 2011). This year, CDC and its partners are teaming up to promote appropriate antibiotic use among the nation’s health care facilities and doctors’ offices to preserve the strength of existing antibiotics and prevent resistant infections. While success of these strategies has been documented over the last decade with less unnecessary prescribing for colds and sore throats, there is still room for improvement as up to half of antibiotic prescriptions are unnecessary.

Ventilator-associated Pneumonias (VAP) - do oral antiseptics help?
In a recent edition of the Lancet Infectious Disease, a report was published by investigators in Belgium that evaluated studies using 2 % chlorhexidine (2,341 patients) and providone-iodine (140 patients) for oral care in patients on ventilators.

The results indicated that there was a significant decrease in the number of VAPs in those patients receiving oral care with chlorhexidine. In those patients receiving providone-iodine, the results were unclear.


The "Black Death" Today
The average person doesn’t realize it, but the causative agent of the "Black Death" (Plague) that swept across much of Europe is still around. The causative agent, Yersinia pestis, infects about 2,000 persons worldwide each year. Here in the United States, there are about 10 to 15 cases annually most of them occurring in the southwestern part of the country. The disease is transmitted there from small ground animals, such as prairie dogs, and coyotes via flea bites.

World Distribution of Plague, 1998

Source: Centers for Disease Control and Prevention
Researchers in England recently extracted \( Y. \text{pestis} \) DNA from the bones and teeth of 109 persons who died from the black death between 1348 and 1350. They found that the DNA from these medieval strains of plague differed significantly from the DNA from today's strains of \( Y. \text{pestis} \).

Their conclusion was that the 14th century outbreak that occurred in Europe was caused by a variant strain of \( Y. \text{pestis} \) that is no longer around.

The mean influenza immunization rate among facilities reporting outbreaks was 51 %. Among those facilities not reporting outbreaks, the mean was 61 %.

The conclusion of the study was that increased vaccination rates among direct-care employees in LTC facilities results in fewer reported outbreaks.


**Mycobacterium porcinum isolated from Public Water Supplies**

Researchers at the University of Texas Health Science Center conducted a five-year study of cases of \textit{Mycobacterium porcinum}. This is a rarely encountered rapidly growing member of the genus which is capable of causing disease.

They studied isolates from 24 patients and came to the conclusion that many of them were related to strains that have shown up in public water supplies.


**Rotavirus Vaccine for Children - Benefits far exceed Risks**

Rotavirus vaccines have had their ups and downs. The first vaccine (RotaShield®), introduced in the 1990s, had to be withdrawn due to excess intussusception cases during the first week after administration.

In 2006, two new vaccines (Rotatix® and Rota Teq®) were introduced. These new vaccines had only about 10 % of the cases of intussusception associated with the earlier vaccine. Intussusception in children occurs when part of the intestine is pulled inward into itself. It can block the passage of food through the intestine. If the blood supply is cut off, the segment of intestine pulled inside can die.

Researchers feel that, after examining the data, the risk of death from the vaccine is far lower than the risk of death associated with rotavirus infection. For every child who dies from vaccine-associated intussusception, there are about 400 children who would have died from rotavirus infection. This is considered by most to be an "acceptable" risk. The investigators have calculated that if 9.5 million children were immunized in South America,
where the disease is a real problem, roughly 144 thousand cases of hospitalization and four thousand deaths would be prevented.

Rotavirus is responsible for severe gastroenteritis associated with watery diarrhea, vomiting and fever. It is the leading cause of diarrhea among infants and young children worldwide. It is responsible for a half million deaths among children under five years old annually throughout the world.

Transmission electron microscopy (TEM) of rotavirus. Note the similarity to a wheel hence the name "rota"  
Courtesy of CDC

For more information on rotavirus infections, readers may access the CDC website on the subject by checking here.


Bacteria found in Mouth may be related to Pneumonia Risk

Researchers at Yale University in New Haven have produced evidence that the composition of oral bacteria found among ventilated patients in intensive care units may play a role as to which patients develop ventilator-associated pneumonia (VAP).

It appears that the proportions of three groups of microorganisms, the Enterococcaceae, the Micrococcaceae and the Mycoplasmataceae, rose sharply among cases of VAP. At the same time, the proportion of Streptococcaceae declined.

The conclusion from this study was that microbes may be "markers of impending disease".

Streptococcus mutans from a mouth culture  
Courtesy of CDC


U.S. Senate acts to Promote The Development of Antibiotics

The medical community has long known that the day is rapidly approaching when we will be literally "out of antibiotics" to treat serious infections caused by the emergence of the so-called "super bugs".

Recently, Senator Richard Blumenthal (D-CT) and Senator Bob Corker (R-TN) introduced a bill into the Senate with the title of "The Generating Antibiotic Incentives Now (GAIN) Act. A similar bill has also been introduced into the House by Representative Phil Gingrey, MD (R-GA).

This bill, if passed, will provide significant incentives in the development of new antibiotics by providing the following:

- It will grant an additional five years of market protection to products which are used to "treat, prevent, detect and diagnose antibiotic-resistant infections.
- It will make these products qualified for "fast tracking" by the U.S. Food and Drug Administration (FDA) so that they can come onto the market faster.

It should be pointed out that while this bill promotes the development of new drugs, it also promotes the development of new tests for the detection of infections. As a
laboratorian, this writer was pleased to see that in the bill.

Don't you love it when the two political parties can work together on something? Maybe this will become "infectious".

For more information on this bill, readers should click here.

**Federal agency to award $34 million to fight Healthcare-associated Infections**
The Agency for Healthcare Research and Quality (AHRQ), which is part of the U.S. Department of Health and Human Services (HHS) recently announced that it will award $34 million to study new modules to fight the following infections:

- Catheter-associated urinary tract infections - this is the **most common** healthcare-associated infection
- Surgical site infections - complications of surgery. These can occur at the incision site or deeper within the body
- Ventilator-associated pneumonia (VAP). These can occur in patients who required mechanically-assisted breathing

For more information, click here to access the press release from AHRQ.

**Copper Coverings may reduce Infection Rates in Hospitals**
Researchers at the Medical University of South Carolina recently reported that covering surfaces in patients' rooms may reduce hospital-associated infection rates.

To study the effect of copper, they equipped eight intensive care rooms in three hospitals with copper coverings in the following areas:

- Bed rails
- IV poles
- Over-bed tables
- Chairs
- Computer monitor bezel
- Call button or computer mouse

These area/items represent roughly 10% of all the surfaces in the rooms.

The results of this study on the effect of copper coating were as follows:

- The overall rate in the copper rooms was 8.95 per 1,000 patient-days as compared with 15.6 per 1,000 in control rooms

The rate for MRSA and/or VRE was 6.88 cases per 1,000 patient-days in the copper rooms as compared to 15.72 per 1,000 in the control rooms.

The only problem we see is the soaring price of copper. In the New England area, it has become popular for thieves to steal the antique copper drain pipes from the roofs of colonial homes. They are then melting down these two hundred year old antiques to get the copper. Also, keeping these copper surfaces bright and respectable looking might prove to be a problem.

Salgado, C. et al. 2011. Copper surfaces (CuS) significantly lower rate of hospital acquired infections (HAIs) in the medical intensive care unit (MICU). Infectious Disease Society of America 49th Annual meeting. Abstract 163. Click here to access abstract.

**Should Scrubs be Washed at Home?**
According to a study recently carried out in the U.K., the answer is **no**. The study showed that scrubs washed at home might still harbor methicillin-resistant *Staphylococcus aureus* (MRSA) and other nosocomial pathogens such as *Acinetobacter*. This may be due to the fact that lower water temperatures are used and modern machines use less water to save on energy and resources.

The problem is magnified by the fact that many hospitals in the U.K. no longer provide in-house washing of uniforms in order to save money.


**Free CME/CEU credits**

Norovirus outbreak management and disease prevention. Courtesy of the Centers for Disease Control and Prevention. Click here to access offering.

Antibiotics and patient's age add to *C. difficile* risk in hospital. Courtesy of MedPage Today. Click here to access offering.

CMV infection may cause salivary gland cancer. Courtesy of MedPage Today. Click here to access offering.
Our Readers Ask

Alcohol-based Sanitizers and Viruses

**Question:** I read somewhere that there are viruses that just aren't killed by the alcohol-based sanitizers. Is that true?

**Answer:** Unfortunately, yes. The Noroviruses are very poorly inactivated by alcohol (of any type). The use of these hand sanitizers during an outbreak of Norovirus infection often only leads to a false sense of security and further spread of infection. Good old hand hygiene has to be re-instated.

Anisakiasis

**Question:** What is this parasite? I heard you can get it from eating uncooked fish?

**Answer:** Yes you can. *Anisakis simplex* and *Pseudoterranova decipiens* are roundworms whose third stage larvae reside in fish and squid. These in turn are eaten by marine mammals such as dolphins. Humans become infected by eating raw or undercooked infected marine fish. After ingestion, the larvae penetrate the gastric and intestinal mucosa leading to the symptoms typically associated with anisakiasis. These include abdominal pain, nausea, vomiting, diarrhea blood and mucus in the stool and mild fever.

Diagnosis is generally made by endoscopy, radiography or surgery (if the worm is imbedded). Infestation cannot be detected by examining stool specimens.

Coiled larvum of *Anisakis simplex* in a frozen filet of cod

*Courtesy of CDC*

Centers for Disease Control and Prevention. 2010. Parasites - Anisakiasis. Click [here](#) to access website.


---

**News Credits**

William F. Vincent, PhD, Senior Editor
Frances A. Vincent, BSN, RN, Associate Editor and Nurse Consultant
Marian Rector, RN, Nurse Educator
Mervyn Rimai, MD, Medical Consultant
Neena Singh, MD, Medical Review
Lucy D’Angelo, Compliance Review

Published monthly by Quest Diagnostics. All inquiries, suggestions and comments should be addressed to William F. Vincent, PhD, Quest Diagnostics, P.O. Box 420, East Granby, CT 06026-0420
Tel. 800-982-6810 Ext. 7158
Fax 860-653-3276
E-mail: [William.F.Vincent@QuestDiagnostics.com](mailto:William.F.Vincent@QuestDiagnostics.com)
From The Editor's Desk

The Great October Nor’Easter (2011)
Winter storms that roar in at New England from the Southwest are traditionally referred to as "Nor’Easters". They usually start in late November and run through March. Occasionally, one will arrive in April making conditions really miserable for us. In October of 2011, however, we got a surprise – the arrival of a Nor’Easter on October 30th. The trees were still burdened down with much of their foliage and 10 to 15 inches of wet snow brought limbs, trees and power lines crashing to the ground. The result was that we were without power in almost all parts of my town for 10 or 11 days. With below-freezing nights, it got quite interesting trying to stay warm, cook meals and generally survive. This storm was classified as a “five-hundred year” storm. The last storm close to this magnitude occurred in 1804. The most snow ever previously recorded in October for this area of Connecticut was 1.5 inches. This storm dumped anywhere from 10 to 20 inches on most areas of Northwest Connecticut.

This is a view from our driveway across the front lawn to the street. You can see the power line to our house lying down on the ground. We are thankful to a power crew from Shreveport, Louisiana for hooking it up again for us.

This is our driveway the day after the storm. We had a hemlock across it. Unfortunately, it's poor quality wood for a fireplace.

The Senior Editor gets to try out his brand new snow blower. The snow was so wet that it was hard to move it and the chute kept plugging up. You can see the leaves still on the tree behind me.
Trees still loaded with much of their foliage came crashing down all night long. When we awoke the next day, our neighborhood looked like a combat zone.

Snowplows were not able to get through for several days due to downed trees and wires.

We had our stairwell leading up to the front door all decorated for Halloween. Halloween, however, got called off. Needless to say, parents were reluctant to let their children go door-to-door in the snow and downed wires with no lights in the houses to boot.