August 31, 2017

Dear Colleagues,

So far this year the number of cases of pertussis in Ottawa County has more than tripled compared to the number of cases reported all of last year. To help reduce the incidence of this disease, the Ottawa County Department of Public Health requests your assistance in the follow ways:

1) Maintain a high level of awareness/suspicion for pertussis, particularly with individuals who have been experiencing a persistent cough or are showing other clinical signs/symptoms compatible with this disease.
2) Test for pertussis if your clinical evaluation indicates pertussis as a possible etiology.
3) Unless otherwise contraindicated consider initiating antibiotic therapy while awaiting test results. Test results are usually not available for 3-4 days, during which time an infected person could easily infect several other individuals.
4) Immediately report all positive test results either on MDSS or to the Ottawa County Department of Public Health.
5) Continue to stress to all parents the importance of childhood immunizations. Be especially persistent with those parents who have not had their children immunized or whose children are behind in their immunization schedule. Be cognizant of the fact however, that prior vaccination does not guarantee immunity and that testing or treatment should never be withheld because of a person’s vaccination status.
6) Strongly recommend the Tdap vaccine to all adolescents and adults who have not previously received this immunization. Here in Michigan almost 2/3 of all pertussis cases occur in individuals ages 10 and older.

Attached to this Health Alert is the CDC’s “Best Practices for Health Care Professionals on the Use of Polymerase Chain Reaction (PCR) for Diagnosing Pertussis” that we forwarded to you when it was first released in 2011. The information is still accurate and is a good reference for pertussis testing.

If you have any questions, please contact me at 616-494-5548.

Thank you in advance for your cooperation and assistance.

Sincerely,

Paul A. Heidel, MD, MPH
Medical Director
Best Practices for Health Care Professionals on the Use of Polymerase Chain Reaction (PCR) for Diagnosing Pertussis

Summary: With the continuing resurgence of pertussis, health care professionals will likely see more patients with suspected pertussis. Proper testing criteria, timing of testing, specimen collection techniques, protocols for avoiding specimen contamination, and appropriate interpretation of test results are all necessary to ensure that Polymerase Chain Reaction (PCR) reliably informs patient diagnosis. PCR is an important tool for timely diagnosis of pertussis and is increasingly available to clinicians. PCR is a molecular technique used to detect DNA sequences of the Bordetella pertussis bacterium and unlike culture does not require viable (live) bacteria present in the specimen. Despite this advantage, PCR can give results that are falsely-negative or falsely-positive. The following compilation of best practices is intended to help health care professionals optimize the use of PCR testing for pertussis by avoiding some of the more common pitfalls leading to inaccurate results.

Recommendations for Testing

Whom should you test?
Only patients with signs and symptoms consistent with pertussis should be tested by PCR to confirm the diagnosis. For guidance in distinguishing signs and symptoms of pertussis from those of other conditions, see http://www.cdc.gov/pertussis/clinical/features.html. Testing asymptomatic persons should be avoided as it increases the likelihood of obtaining falsely-positive results. Asymptomatic close contacts of confirmed cases should not be tested and testing of contacts should not be used for post-exposure prophylaxis decisions.

When should you test?
When possible, you should test patients for pertussis during the first 3 weeks of cough when bacterial DNA is still present in the nasopharynx, because after the fourth week of cough, the amount of bacterial DNA rapidly diminishes, increasing the risk of obtaining falsely-negative results by PCR. For more information on diagnostic testing, see http://www.cdc.gov/pertussis/clinical/diagnostic-testing/diagnosis-confirmation.html.

Also, PCR testing after 5 days of antibiotic use is unlikely to be of benefit, because PCR testing following antibiotic therapy also can result in falsely-negative findings, although the exact duration of positivity following antibiotic use is not well understood.

How should you obtain specimens?
You should obtain specimens for PCR by aspiration or swabbing the posterior nasopharynx, rather than by throat swabs or anterior nasal swabs which both have unacceptably low rates of DNA recovery and should therefore not be used for pertussis diagnosis. For more information, see http://www.cdc.gov/pertussis/clinical/diagnostic-testing/specimen-collection.html.

What should you do to avoid contamination of clinical specimens with pertussis DNA?
Some pertussis vaccines¹ have been found to contain PCR-detectable B. pertussis DNA. Environmental sampling has identified B. pertussis DNA from these vaccines in clinic environments.

¹ Vaccines shown to contain PCR-detectable DNA include Pentacel®, Daptacel®, and Adacel®. Leber A et al. Detection of Bordetella pertussis DNA in Acellular Vaccines and in Environmental Samples from Pediatric Physician Offices, in 2010 Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC): Boston, USA.
While DNA in the vaccines does not impact the safety or immunogenicity, accidental transfer of the DNA from environmental surfaces to a clinical specimen can result in specimen contamination and falsely-positive results. If health care professionals adhere to good practices, there is no need to switch vaccines. Clinicians should adhere to the following vaccine preparation and administration best practices and basic infection-control measures, to prevent cross-contamination.

**Best Practices for Preparing and Administering Vaccines**
- Prepare and administer vaccines in areas separate from pertussis specimen collection because doing so may reduce the opportunity for cross contamination of clinical specimens.
- Take care to avoid contamination of surfaces when preparing and administering vaccines.

**Adherence to Basic Infection-control Measures**
- Wearing clean gloves immediately before and during specimen collection or vaccine preparation and administration with immediate disposal of gloves after the procedure, and
- Cleaning clinic surfaces using a 10% bleach solution to reduce the amount of nucleic acids in the clinic environment.

The use of liquid transport media likely also contributes to falsely-positive results from contaminant DNA. When using liquid transport media, DNA that is accidentally transferred from hands to the swab shaft can be washed off into the liquid medium which freely circulates around the transport tube; this liquid is later extracted to obtain DNA for PCR testing. Use of a semisolid or non-liquid transport media or transport of a dry swab without media should prevent contaminant DNA on the swab shaft from reaching the part of the specimen that is later extracted. If using liquid transport medium, the swab stick should be handled with care and only above the red line or indentation which marks where the shaft is snapped off after insertion into the medium. Performing NP aspiration rather than swabbing the NP may also prevent contamination from occurring as the aspirate kit (syringe or bulb style) is a closed system at the point of specimen collection.

**Recommendations, Understanding and Interpreting PCR Results**

PCR assays for pertussis are not standardized across clinical laboratories. Testing methods, DNA targets used, and result interpretation criteria vary, and laboratories do not use the same cutoffs for determining a positive result. With PCR, high cycle threshold (Ct) values indicate low levels of amplified DNA; for pertussis, these values may still indicate infection but can also be the result of specimens contaminated with DNA from the environment at the time of specimen collection. Clinical laboratories might report high Ct values as any of the following: positive, detected, indeterminate, or equivocal. In addition, most clinical laboratories use a single target PCR for IS481, which is present in multiple copies in *B. pertussis* and in lesser quantities in *B. holmesii* and *B. bronchiseptica*. Because this DNA sequence is present in multiple copies, IS481 is especially susceptible to falsely-positive results. Use of multiple targets may improve specificity of PCR assays for pertussis. Clinicians are encouraged to inquire about which PCR target or targets are used by their laboratories. Interpretation of PCR results, especially those with high Ct values, should be done in conjunction with an evaluation of signs and symptoms and available epidemiological information.

For more information:
- For the entire guidance on PCR best practices in diagnosing pertussis, see [http://www.cdc.gov/pertussis/clinical/diagnostic-testing/diagnosis-pcr-bestpractices.html](http://www.cdc.gov/pertussis/clinical/diagnostic-testing/diagnosis-pcr-bestpractices.html)
- For distinguishing clinical features of pertussis, see [http://www.cdc.gov/pertussis/clinical/features.html](http://www.cdc.gov/pertussis/clinical/features.html).
- For more information on diagnostic testing, see [http://www.cdc.gov/pertussis/clinical/diagnostic-testing/index.html](http://www.cdc.gov/pertussis/clinical/diagnostic-testing/index.html).
- CDC’s toll-free information line, 800-CDC-INFO (800-232-4636) TTY: (888) 232-6348, is available 24 hours a day, every day.

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**Categories of Health Alert messages:**

- **Health Alert**
  - conveys the highest level of importance; warrants immediate action or attention.
- **Health Advisory**
  - provides important information for a specific incident or situation; may not require immediate action.
- **Health Update**
  - provides updated information regarding an incident or situation; unlikely to require immediate action.
HAN InfoService provides general public health information; unlikely to require immediate action.

##This Message was distributed to State and Local Health Officers, Public Information Officers, Epidemiologists and HAN Coordinators as well as Clinician organizations##

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You have received this message based upon the information contained within our emergency notification database. If you have a different or additional e-mail or fax address that you would like us to use please contact your State-based Health Alert Network program at your State or local health department.

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