Utilization of alternative diagnostic sampling techniques during an imported measles outbreak - San Diego, California, 2008

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RESULTS

• A total of eleven (11) additional children were infected; none had received a measles-containing vaccine
• Four (4) of the 12 case-patients (33%) were referred to commercial laboratory facilities to have their blood drawn for measles serology, increasing the opportunity for disease transmission in these settings
• Clinicians did not suspect measles in a child with recent international travel and febrile rash illness or in asymptomatic children with exposure to a known measles case; appropriate infection control precautions were not implemented
• During the outbreak, obtaining venous blood draws on infant and child suspect cases was problematic for a variety of reasons
• Capillary specimens, collected via finger or heel stick, were found to be acceptable for measles serology
• Though less demanding than venipuncture training, public health nurses and communicable disease investigators did require some training and practice in capillary specimen collection
• Collection of capillary specimens alleviated some investigative burden, as public health nurses and communicable disease investigators were able to obtain capillary specimens in patient homes; however, adequate specimens were not produced on every collection attempt
• Capillary specimen collection was often viewed by patients and parents as a more acceptable method of serologic specimen collection, as it was perceived to be a less painful and less invasive procedure

METHODS

• Disease control measures were implemented, including isolation of suspect cases and health department coordination of specimen collection from suspect cases (i.e., limiting visits to commercial laboratories and additional healthcare facilities to decrease the opportunity for disease transmission)
• A public health investigation was initiated, including:
  - contact tracing and quarantine of exposed, susceptible persons
  - heightened surveillance
  - active case finding
• Laboratory confirmation was attempted on all suspect cases

SPECIMEN COLLECTION

1. Obtain supplies:
   - Two (2) to three (3) microcollection devices consisting of a capillary tube and a serum separator microtube
   - Heparinized tubes are acceptable
   - Consult your public health laboratory regarding acceptable collection devices
   - Bone marrow, liver, or kidney
   - Gloves
   - Sterile gauze
   - Band-aid
2. Label each serum separator microtube with patient name (or other identifier), date of birth, and date/time of specimen collection
3. Massage the puncture site to increase circulation and enrich blood flow
   - the heel is the recommended puncture site for infants 12 months of age or younger; the finger may be a suitable puncture site for children over 1 year of age
4. Clean the puncture site (heel or finger) well with alcohol; allow to dry
5. Puncture the heel (see Figure 1 for details on heel puncture sites) or the side of the pulp of the third or fourth finger with a sterile safety lancet
6. Wipe away the first drop of blood with sterile gauze
7. Touch the first capillary tube to subsequent free-flowing blood produced at the puncture site
   - through capillary action, blood will fill the tube
   - if blood flow is inadequate, gently massage the proximal portion and firmly press on the distal portion of the foot or finger (do not let blood run down the heel or finger)
   - holding the microcollection device at a downward angle may improve collection results
8. Repeatedly touch additional capillary tubes to blood produced at the puncture site until 2-3 tubes are filled. A minimum of 100 µl of serum is required; however, it is recommended that 2-3 capillary tubes be filled, even if the 100 µl volume requirement is met with the first capillary tube
   - allow large blood droplets to form; avoid contact between the skin and capillary tube
9. Express collected blood into the serum separator microtube by standing the microcollection device upright (capillary tube inserted in serum separator tube). After the capillary tube drains into the serum separator tube, lightly tap or shake the remaining blood out of the capillary tube
10. Stop the bleeding and cover the puncture site with a band-aid
11. Remove the empty capillary tubes from the serum separator microtubes and discard the capillary tubes and lancet in an appropriate biohazard container: cap the serum separator microtubes
12. Keep collected specimens cool during transport (e.g., in a Styrofoam container with ice packs)
13. Upon receipt at the laboratory, specimens must be microfuged before processing

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