Register. A copy of the October 17, 1997, *Federal Register* may be obtained, via mail by calling 202-512-1530 or accessed on-line through the US Government Printing Office at their web site: http://www.access.gpo.gov.

FROM: 1. Occupational Safety and Health Administration. Occupational exposures to tuberculosis. *Federal Register* October 17, 1997;201:54159-54308.

2. Occupational Safety and Health Administration. Instruction CPL2-106. February 9, 1996.

Mycobacterium tuberculosis Transmission From Bronchoscope

Two recent reports of *Mycobacterium tuberculosis* transmission from contaminated bronchoscopes underscore the importance of cleaning of lensed instruments, such as bronchoscopes, prior to disinfection or sterilization. Failure to clean, coupled with grossly inadequate disinfection practices, can result in infection transmission.

In one report, investigators from Johns Hopkins University School of Medicine identified two isolates with identical restriction fragment-length polymorphism (RFLP) patterns as part of an ongoing laboratory-based study of TB isolates.[1]

The isolates were found to be from two patients diagnosed 6 months apart as having TB. Both isolates had a unique and identical l0-banded IS6110 RFLP pattern. Their only identifiable link was care at the same hospital.

An investigation was initiated, medical charts and bronchoscopic records were reviewed, and cleaning and disinfection of bronchoscopes was observed. It was determined that the first patient underwent bronchoscopy and was diagnosed as having TB. The second patient underwent bronchoscopy 2 days later and was diagnosed as having small cell carcinoma. Following 6 months of chemotherapy and radiation therapy, the second patient developed fever and an infiltrate of the right upper lobe of the lung. Bronchoscopic washings revealed acid-fast bacilli and grew *M tuberculosis.* Both patients had undergone bronchoscopy with the same instrument in the same operating room with no intervening bronchoscopies. Bronchoscope cleaning and disinfection procedures were inconsistent with national guidelines. The authors concluded that a contaminated bronchoscope was the most likely source of *M tuberculosis* transmission between these two patients.

In a second report, investigators from the CDC described an epidemiological investigation of nosocomial transmission of multidrug-resistant (MDR) TB.[2] Eight patients with MDR TB were identified in South Carolina; all isolates were resistant to seven drugs and had matching DNA fingerprints (strain W1). Community links were identified for five patients (l-5). However, no links were identified for the other three patients (6-8) except being hospitalized at the same hospital as one community patient.

An outbreak investigation revealed that patient 5 (community-link patient) and patient 8, diagnosed April 1995 and November 1995, respectively, had clinical courses consistent with MDR TB, with smear-positive and culture-positive specimens and cavitary lesions on chest radiographs. Both died of MDR TB less than 1 month after diagnosis. Patients 6 and 7 (diagnosed in May 1995) each had one positive culture for MDR TB (specimens were collected during bronchoscopy). Patient 6 had a skin-test conversion after bronchoscopy. Neither patient 6 nor patient 7 had a clinical course consistent with MDR TB, neither was treated for MDR TB, and both are alive and well. No evidence of laboratory contamination of specimens, transmission on inpatient wards, or contact among patients was found. All four received bronchoscopies in May 1995; patients 6, 7, and 8 had bronchoscopies 1, 12, and 17 days, respectively, after patient 5. Observations revealed that bronchoscope cleaning was inadequate, and the bronchoscope was never immersed in disinfectant

The authors concluded that inadequate cleaning and disinfection of the bronchoscope after the procedure performed on patient 5 led to subsequent false-positive cultures in patients 6 and 7, transmission of infection to patient 6, and active MDR TB in patient 8.

In both reports, direct observation of cleaning and disinfection of bronchoscopes revealed variation from institutional policy and national recommendations, including the "APIC Guideline for Infection Prevention and Control in Flexible Endoscopy" of the Association for Professionals in Infection Control and Epidemiology, Inc (APIC).[3] As highlighted in the APIC guideline, disinfection cannot be achieved reliably without first accomplishing thorough mechanical cleaning. Even so, complex devices such as bronchoscopes remain a challenging device for reprocessing between patient use. Thorough cleaning of endoscopes can itself achieve a mean 4-log reduction in microbial load, and use of an appropriate germicide and good quality-control monitoring can offer additional patient safety.[4]

FROM: 1. Michele TM, Cronin WA, Graham NM, Dwyer DM, Pope DS, Harrington S, et al. Transmission of *Mycobacterium tuberculosis* by a fiberoptic bronchoscope. Identification by DNA fingerprinting. *JAMA* 1997; 278(13):1093-1095.

2. Agerton T, Valway S, Gore B, Pozsik C, Plikaytis B, Woodley C, et al. Transmission of a highly drug-resistant *strain (strain* W1) of *Mycobacterium tuberculosis:* community outbreak and nosocomial transmission via a contaminated bronchoscope. *JAMA* 1997;278(13):1073-1077.

3. Martin MA, Reicheldorfer M, APIC Guideline Committees. APIC guideline for infection prevention and control in flexible endoscopy. *Am J Infect Control* 1994;22:19-38.

4. Rutala WA, Weber D. FDA labeling requirements for disinfection of endoscopes: a counterpoint. *Infect Control Hosp Epidemiol* 1995;16:231-235.

MRSA in Australia

Despite vigorous attempts at eradication over the last 20 years, methicillin-resistant *Staphylococcus aureus* (MRSA) continues to be a major nosocomial pathogen in Australian acute-care institutions, reports Dr. McDonald from the Geelong Hospital in Victoria, Australia. The epidemiology of hospital spread is now well-characterized; infected and colonized patients provide the primary reservoirs, and transmis-

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