

In This Issue...

- Headlines
- Upcoming Trainings
- TBit
- Introducing
- Related Links
- Case Presentation

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Heartland Presents a National Web Seminar on TB/HIV

On Tuesday, November 27, 2007, Heartland National TB Center will sponsor a web seminar entitled **TB/HIV: Managing the Co-Infected Patient**. Dr. Timothy Sterling, Associate Professor of Medicine at Vanderbilt University Medical Center (UMC), is the Director of Epidemiology Research, Division of Infectious Disease, Vanderbilt UMC; Director of Epidemiology and Outcomes Unit, Vanderbilt-Meharry Center for AIDS Research; and Director of Tuberculosis Research with the Metro-Davidson Health Department. Dr. Sterling has extensive patient and research experience in the field of TB/HIV co-infection.

This webinar is intended for TB program staff and clinical personnel including physicians, nurses and healthcare staff who care for TB/HIV co-infected individuals.

Upon completion of this training, participants will be able to:

- Describe current concepts in the diagnosis and management of TB and HIV co-infection
- Discuss common anti-tuberculosis drug interactions with antiretroviral therapy
- Outline an appropriate TB treatment regimen
- Discuss a case study of a patient with TB/HIV co-infection

This national web seminar is open to interested participants across the United States, but enrollment is limited to 100 lines per region (see map on Page 2) and pre-registration via online registration is required. Registration and participation is FREE. Due to a limited number of lines, it is recommended that one person register one line and invite multiple participants to view together.

The web seminar will be held **Tuesday, November 27, 2007** at **10:00–11:00 am PST, 11:00 am–12:00 pm MST, 12:00–1:00 pm CST and 1:00–2:00 pm EST.**

Continued on page 2

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Continued from page 1

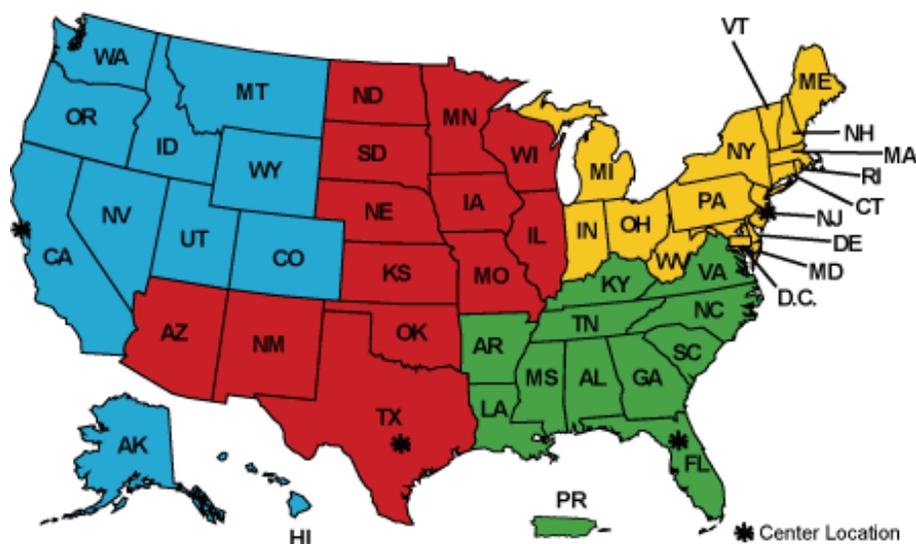
Click this link to register online: [TB/HIV Webinar, Heartland](#). The deadline is November 19, 2007. You will receive log-in information and system requirements prior to the event; it will be sent to the e-mail account entered during the registration process.

1.0 hours of Physician (CME) and nursing (CNE) continuing education credits will be available to all viewers who complete a *Sign-In Sheet* the day of the webinar and a post-training electronic evaluation.

This webinar is presented in collaboration with the Centers for Disease Control and Prevention and the Regional Training and Medical Consultation Centers (RTMCC): Francis J. Curry National Tuberculosis Center, New Jersey Medical School Global Tuberculosis Institute and the Southeastern National Tuberculosis Center.

USA Regional Coverage By RTMCCs

Curry **Heartland**
New Jersey **Southeastern**



For questions please contact Mary Long,
mary.long@uthct.edu or 1-800-839-5864.

Remaining 2007 Heartland Trainings

Date	Course	Location
December 4-7	TB Intensive	Tyler, Texas

Please go to <http://www.heartlandntbc.org/training.asp#regional> for contact and registration information for this course. Enrollment is limited and is on a first-come basis for registrants from the Heartland partner states (see map above).

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Additional Heartland Web Seminars

On December 10, 2007 Heartland will sponsor a webinar entitled **TB Medications: Recognizing and Responding to Adverse Drug Reactions**. This webinar is intended for TB program staff and clinical personnel including physicians, nurses and healthcare staff who treat TB patients and seek a better understanding of the possibilities and implications of adverse reactions to the common anti-tuberculosis medications.

Registration for this regional web seminar will be open November 10, 2007 via the [Heartland website](#). [Enrollment will be limited to 100 lines from the Heartland partner states](#) (see map on Page 2) and pre-registration via online registration is required. Registration and participation is FREE. Due to a limited number of lines, it is recommended that one person register one line and invite multiple participants to view together.

Continuing education hours will be given to all participants who complete the requirements. For questions please contact Mary Long, mary.long@uthct.edu, 1-800-839-5864.

TBit

Forging Partnerships to Eliminate Tuberculosis: A Guide and Toolkit is a resource guide and toolkit for strengthening TB elimination strategies through partnerships. The guide and toolkit are available on the CDC Division of Tuberculosis Elimination website at <http://www.cdc.gov/tb/pubs/forge/default.htm>.

The Guide and Toolkit are also available in print and on CD ROM (a CD ROM is included with the print publication). The CD ROM includes the guide (in PDF format) and toolkit (in PDF and Word formats that can be adapted for local use). The CD ROM can also be ordered separately. The print version of the guide/toolkit and the CD ROM may be ordered online at https://www2.cdc.gov/nchstp_od/piweb/tborderform.asp.

The VISION of the Heartland is to provide *excellence, expertise, and innovation* in training, medical consultation, and product development to reduce the impact of tuberculosis in our region.

The MISSION of Heartland National TB Center is to build capacity with our partners. We will share expertise in the treatment and prevention of tuberculosis by: developing and implementing cutting-edge trainings, delivering expert medical consultation, providing technical assistance, and designing innovative educational and consultative products.

Introducing Joint Regional Training and Medical Consultation Center (RTMCC) Products Page

The **Joint RTMCC Products Page** lists TB-specific educational materials and resources developed by all four Regional Training and Medical Consultation Centers. The web page is physically located on the Southeastern National TB Center's web site. It is jointly managed by all Centers and is updated as new products are completed.

A wealth of tuberculosis-specific educational materials and resources, in diverse formats, exist for the TB healthcare professional or those individuals interested in increasing their knowledge of TB. This web page was developed to succinctly display and provide access to the educational materials developed by the CDC-funded TB RTMCCs. The resources listed on this web page include print, audiotape, videotape, CD-based tools, and MP3 files. The title, a brief description, publication date, and a link to the product can be found next to a thumbnail picture of each product. There is a search feature that allows you to look for products by topic, date, Center and more. Most products listed are in a PDF format that allows for immediate downloading or printing. There are currently 105 products available.

To view additional information or to order the products listed, please contact the producing RTMCC.

For additional TB training and education materials, please visit the CDC Division of Tuberculosis Elimination Website at www.cdc.gov/tb or the TB Education and Training Resources Website at www.findtbresources.org.

Related Links

- [Division of TB Elimination, CDC](#)
- [TB Education & Training, National Prevention Information Network](#)
- [TB Education & Training Resources](#)
- [Division of Global Migration & Quarantine, CDC](#)
- [Office of Refugee Resettlement](#)
- [AIDS Education and Training Centers](#)
- [Tuberculosis Research Today](#)
- [National TB Controllers Association](#)
- [American Lung Association](#)
- [Stop TB Partnership](#)
- [Global Health Facts on TB](#)
- [International Union against Tuberculosis and Lung Disease](#)
- [World Health Organization, Tuberculosis](#)



Click on a picture to go directly to that Center's website

Case Presentation

Delayed Culture Conversion, Low Serum Drug Levels

Case History:

Our patient is a 54 year-old male who presented to his physician for follow up of a right upper lobe carcinoma which was resected in 1979. He complained of shortness of breath, weight loss, fatigue, chest pain and a productive cough but no hemoptysis. A chest x-ray on June 20, 2006 revealed new bilateral alveolar infiltrates. He was referred to a pulmonologist and admitted to his hometown hospital on June 20, 2006. Smears were positive for acid fast bacilli and a CT scan June 22nd showed cavitation in the left upper lobe, bilateral infiltrates and mediastinal adenopathy. He was placed on anti-tuberculosis therapy—isoniazid (INH) 300 mgs, rifampin (RIF) 600 mgs, pyrazinamide (PZA) 1500 mgs and ethambutol (EMB) 1600 mgs daily with vitamin B6 50 mgs. Directly Observed Therapy (DOT) was started on July 7, 2006; given Monday through Friday with self-administration on the weekends. His culture grew *Mycobacterium tuberculosis* and was susceptible to INH, RIF and EMB.

The patient's past history included long term tobacco and alcohol abuse. He reported marijuana use in the past but denied intravenous drug abuse. He received medical disability since his lung resection in 1979. He had chronic obstructive pulmonary disease (COPD). He also was positive for Hepatitis C.

His PZA and EMB were discontinued on August 31, 2006 at the normal 2 month mark. The patient's sputum smears and cultures remained consistently positive through September 15, 2006. His sputum cultures remained positive for pansensitive pulmonary TB. While there was slight clinical improvement, the positive cultures nearly 4 months into therapy made him a possible treatment failure. He was referred to the Texas Center for Infectious Disease (TCID) for evaluation and management.

He was admitted to TCID on November 21, 2006. He weighed 149 pounds (5'9"), blood pressure was 177/100, respirations were 26 and irregular, and his pulse was 99. His films showed a stable right upper lobe nodular opacity compatible with tuberculosis. His laboratory findings on admission were: WBC 10.4, hemoglobin 12.9, hematocrit 40.4, platelets 271, metabolic panel was normal except for an albumin of 3.5. Urinalysis was significant for positive nitrate and trace leucocytes however no WBC were seen and there was no growth at 48 hours. Serum INH level was low at 1.29 (3-6 adequate) on 300 mg per day and serum RIF was low at 4.29 (8-24 adequate) on 600 mg per day.

The patient's treatment at TCID was augmented with reinstatement of PZA, EMB, and additional treatment with levofloxacin and amikacin. These were continued for 4 weeks. Based on the low serum levels, INH was increased to 600 mg and RIF was increased to 900 mg daily. His course at TCID was unremarkable; his last positive culture was obtained October 5, 2006. This isolate remained susceptible to all drugs. His sputum cultures converted to negative as of October 7, 2007 although his sputum smears remained AFB positive (less than 1 organism per field) through April 4, 2007. His LFTs remained stable throughout treatment.

The patient was discharged December 18, 2006 back to his home with DOT Monday through Friday and self-administered therapy on the weekends to completion of 6 months post-culture negativity. Patient completed DOT on April 19, 2007.

Continued on Page 6

Case Presentation continued from Page 5

Teaching Points:

Treatment Failure

- Patients with continued or recurrently positive cultures after three months should be evaluated critically to ascertain the reason for delay. Possible reasons include:
 - Nonadherence
 - Drug resistance
 - Malabsorption
 - Laboratory error
 - Extreme biological variation in response
 - Unrecognized vomiting
- Patients with persistently positive cultures after four months are considered treatment failures.
 - The patient in this case study had positive cultures from July 7, 2006 (his treatment start date) through October 5, 2006. Although there were no specific risk factors for malabsorption noted in his health history (e.g. severe gastrointestinal or metabolic abnormality), serum drug level results confirmed subtherapeutic absorption of isoniazid and rifampin.
- Serum drug level monitoring enabled the treating physician to:
 - 1) appropriately identify the cause of treatment failure,
 - 2) safely increase isoniazid and rifampin daily doses by 100 and 50 percent, respectively, without inducing hepatotoxicity, and
 - 3) achieve treatment completion and cure.
- There are several situations where serum drug level monitoring may be helpful:
 - Evaluating cause of treatment failure
 - Persons with a medical condition that may result in abnormal pharmacokinetics of first line drugs
 - Management of MDR or XDR TB

Medication	Number of Hours Following Dose	Dose	Therapeutic Level
Isoniazid	2 hours (if the sample was drawn at 2 hours post dose, and the concentration is within 1 ug/mL of the daily range or within 3 ug/mL of the 2x weekly range, no dosage change is needed)	Daily 300 mg	3-6 mcg/mL
		2x weekly 900 mg	9-15 mcg/mL
Rifampin	2 hours	600 mg	8-24 mcg/mL
Ethambutol	2-3 hours	15-25 mg/kg (daily)	2-6 mcg/mL
		50 mg/kg (2x weekly)	8-12 ug/mL
Amikacin, Streptomycin, Capreomycin	1 hour after IV, 2 hours after IM injection	15 mg/kg 5X per week	25 mcg/mL
Ethionamide	2 hours	500-750 mg daily	1-5 mcg/mL
Moxifloxacin	2 hours	400 mg	4-6 mcg/mL
Levofloxacin	2 hours	750-1000 mg	8-12 mcg/mL
p-Aminosalicylic acid	5-7 hours		10-60 mcg/mL

Modified from: Schlossberg, D., editor. Tuberculosis and Nontuberculous Mycobacterial Infections, fifth edition. McGraw-Hill, Medical Publishing Division. 2006. p. 87.

Case Presentation, Teaching Points continued from Page 6

- Protocols for obtaining serum drug levels are available through the Heartland National TB Center or National Jewish Medical Center

Never add a single drug to a failing regimen

- In patients diagnosed with treatment failure until drug resistance is ruled out through repeat susceptibility testing, patients should be treated with at least two and preferably three new drugs to which they are susceptible:
 - In this case, PZA and EMB were reinstated, and levofloxacin and amikacin were added for four weeks until drug susceptibilities were known. Had the patient been drug resistant, the levofloxacin and amikacin would have been an effective start in progressing the patient towards cure and would have protected against the amplification of drug resistance

Tobacco abuse and TB

- Although not historically considered syndemic, several recent studies out of India have found that smoking may be a significant risk factor for TB disease and TB deaths
- Meta-analysis of TB disease and tobacco abuse in India suggest that smoking may double or triple the risk for TB disease
- TB deaths may be doubled in any smokers and tripled in "bidi" or homemade cigarette smokers
- There is some biological plausibility to increased TB disease and death due to the following smoking related effects:
 - Diminished immune response
 - CD4 lymphopenia
 - Defects in macrophage immune response
 - Mechanical disruption of the cilia function in airways
- The authors of these studies suggest that potentially modifiable risk factors that lead to TB infection, disease and death, such as tobacco smoking, should be targeted for prevention

Request consultation

- Treatment failure is rare and difficult to manage. Managing treatment failure should be in close consultation with an expert
- For state by state expert TB consultation in the Heartland region, use the following web link <http://www.heartlandntbc.org/medical.asp> or contact the HNTC Medical Consultation Service directly at 1-800-TEX LUNG (1-800-839-5864)

References

Bates, M. N. et al. *Risk of TB from Exposure to Tobacco Smoke: A systemic review and meta-analysis [Review Article]*. Archives of Internal Medicine. Vol 167(4), 26 Feb 2007 pp. 335-342.

CDC. *Treatment of Tuberculosis*. Morbidity and Mortality Weekly Report. June 20, 2003. Vol 52 (RR11); pp. 1-77.

Khan, A. E. and Kimerling, M. E. "Chemotherapy of Tuberculosis" in Tuberculosis and Nontuberculous Mycobacterial Infections, fifth edition. Schlossberg, D., editor. McGraw-Hill, Medical Publishing Division. 2006. p. 87

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