TUBERCULOSIS (TB)

The Basics

DURHAM REGION HEALTH DEPARTMENT
Agenda

- What is TB? Stats & Facts
- How is TB Spread?
- TB Infection vs. TB Disease
- Who’s At Risk?
- HIV and TB
- Homelessness and TB
- Immigration Surveillance
- How Do I Protect Myself?
- TB Testing
- Health Department Roles
What Is TB?

- TB is an infectious disease caused by a germ called *mycobacterium tuberculosis*

- **TB is preventable, treatable & curable**

- TB can affect the lungs (pulmonary) but can also be found in the kidneys, bone, brain, intestines, liver, joints, skin, lymph nodes, and reproductive organs (extra-pulmonary)
Global TB Facts:

Worldwide,

- It is estimated that 1/3 of the world is *infected* with TB germ
- 8.9 - 9.9 million cases of TB each year
- 1.5 - 2.0 million people die each year due to TB

World Health Organization, 2010
Global TB Facts:

- Approximately 95% of new cases occur in the developing world.
- Asia, Africa, India, the Middle East, Central and South America, and the Caribbean have higher rates of TB.
- Asia has the highest burden (55%).
- In Africa, due to a high HIV infection rate, ~80% of HIV positive TB cases.

World Health Organization, 2010
Canadian TB Facts:

In Canada:
- One new case every 6 hours
- One death every 2 weeks

In 2009:
- 1,599 cases of TB in Canada
- 66% of all cases in Canada were reported in large cities
- Canada’s TB rate was 4.7/100,000
  - 63% of were born in other countries
  - 21% Canadian-born Aboriginals
  - 15% Canadian-born non-Aboriginals

Public Health Agency of Canada, 2009
Ontario TB Facts vs. Durham TB Facts
Crude Incidence Rate for Tuberculosis
Durham Region and Ontario, 1990-2010

Source: iPHIS Database, Durham Region Health Department, Extracted March, 2011; Ontario data, MOHLTC [online] cited March 2011 from www.publichealth.ca; and Ontario Population Estimates, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO
Age-Specific Incidence Rate for Tuberculosis
Durham Region and Ontario, 1990-2009 Combined

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Source: iPHIS Database, Durham Region Health Department, Extracted March, 2011; Ontario data, MOHLTC [online] cited March 2011 from www.publichealth.ca; and Ontario Population Estimates, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO
Active Tuberculosis Cases in Durham Region by Origin, 2005-2010 Combined

- Born Outside Canada: 90.5%
- Non-Aboriginal, Born in Canada, History of Travel to Endemic Area: 4.8%
- Non-Aboriginal, Born in Canada, No or Unknown History of Travel to Endemic Area: 4.8%

Source: iPHIS Database, Durham Region Health Department, Extracted March, 2011
How Is TB Spread?

- TB is not highly infectious
- TB is spread through the air
- Requires close, frequent, prolonged exposure
- Transmission depends on infectiousness of person

continued...
How is TB Spread?

To transmit TB, there must be:

- TB germs entering the air when a person with TB disease is coughing, sneezing or singing
- Adequate concentration of TB germs in the air
- Sufficient length of time breathing air with TB germs
TB is **NOT** spread by:

- Shaking hands
- Sharing food or drinks
- Sharing utensils
- Bed linens
- Toilet seats
- Sharing tooth brushes
- Kissing
- Smoking or sharing cigarettes
TB INFECTION VS. TB DISEASE
TB Infection

- TB infection means the TB bacteria has entered the body.
- When this happens, the immune system attempts to keep it “in control.”
- Cells surround the TB bacteria and form a protective, hard shell around it.

Special immune cells form a hard shell (in this example, bacilli are in the lungs).
TB Infection

- A person can have infection but not disease.
- This is called **Latent TB Infection (LTBI)**.
- 10% of all people with TB infection will develop TB disease later in life, the other 90% will remain infected but not develop disease.

continued…
Crude Incidence Rate for Latent Tuberculosis Infections (LTBIs)
Durham Region and Ontario, 2004-2010

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Source: 2004-2005, Durham Region Health Department TB Database; 2006-2010, iPHIS Database, Durham Region Health Department, Extracted March, 2011; and Ontario Population Estimates, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO
TB Infection

- The highest chance of developing disease is within 2 years after exposure
- Infected people can receive medication to prevent TB disease from developing
- Medication must be taken every day for at least 6 months as instructed by a doctor
TB Disease

- TB disease occurs when the immune system can no longer keep the TB germ under control.
- The hard shell breaks down & TB germs multiply rapidly.
TB Disease: Signs & Symptoms

- Cough: more than 3 weeks
- Coughing up blood
- Chest pain
- Fatigue
- Night Sweats
- Weight loss
- Fever

*Not everyone infected with the TB germ becomes sick!
Active Tuberculosis Cases in Durham Region by Site, 1990-2010 Combined

- Pulmonary Tuberculosis: 61.3%
- Tuberculosis Peripheral Lymphadenopathy: 15.6%
- Tuberculosis of Bones and Joints: 4.9%
- Tuberculosis of Other Specified Organs: 4.4%
- Tuberculosis of Genitourinary System: 4.0%
- Miliary Tuberculosis: 2.7%
- Tuberculosis of Nervous System, Unspecified: 2.7%
- Tuberculous Pleurisy: 1.8%
- Tuberculosis of Skin and Subcutaneous Tissue: 1.3%
- Tuberculosis of Intestines, Peritoneum and Mesenteric Lymph: 0.4%
- Tuberculosis of Intrathoracic Lymph Nodes: 0.4%
- Tuberculous Meningitis: 0.4%

Source: iPHIS Database, Durham Region Health Department, Extracted March, 2011
TB Disease: Treatment

- Active TB disease can be treated by taking several medications.
- These medications can cure TB disease if they are taken as directed.
- Medication must be taken for at least 6 months.
- If a person with active TB disease stops taking the medication too soon, drug-resistant TB germ can occur.
Who’s At Risk?

- Close contact with people known or suspected to have \textit{active} TB
- Foreign-born persons immigrating to Canada from high risk areas (\textit{within 2 years of arrival})
- Homeless or under-housed
- Persons living with HIV/AIDS
- People with certain medical conditions which compromise immunity

continued...
Who’s At Risk?

- Aboriginals
- Alcoholics & Injection Drug Users (IDUs)
- People with a history of past TB disease (only if not adequately treated)
- Elderly who have lived in an era when TB was common or lived in an area with high TB rates
- Occupational exposure:
  - Hospital staff
  - Shelter staff/volunteers
  - Staff & residents of institutions (i.e. Nursing Homes, Correctional Facilities)
HIV and TB

- TB is a leading cause of HIV-related deaths worldwide
  - Up to 80% of people with TB test positive for HIV
  - About 30% of HIV-infected persons have LTBI
  - In 2008:
    - About 1.4 million new cases of TB among persons with HIV infection
    - 23% of the estimated 2 million HIV deaths were due to TB

World Health Organization, 2010
HIV and TB

- In Canada, co-infection is likely to become more important, particularly in immigrants and refugees from TB and HIV endemic countries, and in Aboriginal people.

- HIV prevalence is commonly much higher among people with active TB than in the general population.

continued...
HIV and TB

- People with HIV infection are vulnerable to a wide range of infections
- TB is harder to diagnose in HIV positive people
- TB progresses faster in HIV infected people
- TB in HIV positive people is more likely to be fatal if undiagnosed or left untreated

continued…
HIV and TB

- All persons with newly diagnosed TB should be HIV tested
- HIV infected persons who have had recent close contact with an infectious TB patient should be screened and assessed
- Knowledge of HIV status of TB patients may influence their treatment regimen
Homelessness and TB

- The homeless are at a greater risk than the general population in developing TB

- Because......
  - The shelter environment, which is often crowded and poorly ventilated
  - Delays in people seeking medical follow-up, diagnosis and medical care
  - Alcohol and substance abuse
  - Underlying medical conditions
  - Poor nutrition

continued...
Homelessness and TB

- People who are homeless may have difficulty in taking medications regularly.

- The person must not return to the shelter system until deemed to be non-infectious by a TB specialist, and should be transferred to alternative housing.

- TB should be suspected in any homeless person who has a fever and a productive cough that lasts over three weeks.

- Canadian-born and foreign-born homeless persons were studied over a 10-year period
- Foreign-born homeless persons increased from 24% to 37%
- About 20% of Canadian-born homeless persons with TB died within one year of diagnosis
- A total of 3,685 active TB cases were reported
  - 102 (2.8%) met the study criteria:
    - No fixed address
    - Living on a street or staying in shelters
    - Using services for homeless persons >1 per week


- **Origin of Birth:**
  - 47 (53%) were Canadian born, non-Aboriginal
  - 13 (15%) were Aboriginal
  - 28 (32%) were born outside Canada

- **Infection site:**
  - 67 (74%) had TB in the lungs (*pulmonary*)
  - 21 (23%) had TB in other organs (*extra-pulmonary*)

continued...

Concurrent conditions:
- HIV positive (12%)
- Mental health disease (11%)
- Lung disease (9%)
- Liver disease (32%)
- Diabetes (12%)
- Alcohol abuse (32%)
- Injection drug use (13%)
- Non-injection drug use (7%)

continued…

- **Treatment Outcome:**
  - 70 (78%) completed treatment
  - 17 (19%) died while receiving treatment
  - 2 (2%) lost to follow up

- **Challenges for homeless TB persons:**
  - Accessing the health care system
  - Prioritizing basic needs (i.e. food and shelter)
  - Cultural/language barriers

- Adherence to treatment is often challenging for persons who are homeless, and who may have other concurrent conditions
Immigration Surveillance

- TB prevention and control is a public health responsibility

- All immigrant applicants to Canada are required to undergo an *Immigration Medical Examination (IME)* prior to entry

- Provides appropriate medical follow-up to rule-out active TB disease

- People can be offered treatment
Crude Incidence Rate for Medical Surveillance Cases
Durham Region and Ontario, 1991-2010

Source: iPHIS Database, Durham Region Health Department, Extracted March, 2011; and Ontario Population Estimates, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO
Immigration Surveillance

- If **active** TB disease is found, the person is denied entry until they have received adequate treatment and have been reassessed.

- If evidence of **inactive** TB is found:
  - Abnormal chest X-ray, or
  - History of previously treated TB, or
  - Positive skin test

  The person receives medical clearance to go to Canada with a condition of entry **within 30 days** of their arrival.

- The person is provided with a copy of the *Medical Surveillance Undertaking Form (IMM 535)* and instructions on contacting local public health authorities.
Immigration Surveillance

- Some individuals have their initial Immigration Medical Examination (IME) and chest X-ray done while in Canada by Designated Medical Practitioners.

- Examples include:
  - Refugees
  - Students or visitors who decide to stay longer than 6 months
  - Family members who were visitors and have applied for permanent residency to stay in Canada

- The person is provided with an *In-Canada Public Health Follow-up Form* and instructions on contacting local public health.
TB Diagnostic and Treatment Services for Uninsured Persons (TB-UP) Program

- Reduces the public health risk due to transmission of TB from uninsured persons within Ontario.

- All uninsured persons in Ontario have access to diagnostic and treatment services required for assessment and/or treatment for active TB disease or LTBI.

continued…
The following services will be covered under the TB-UP program:

- Physician/Specialist services (paid on a fee-for-service basis)
- Laboratory services
- Radiology services

The following services will NOT be covered under the TB-UP program:

- Any services/expenses the person who receives hospital in-patient services
- Services provided by physicians or other service providers who are normally compensated through a global budget or an alternative payment process through an organization/agency and are not paid on a fee-for-service basis
Duty to Report

- All provinces and territories legally require reporting of TB to public health authorities

- Under the *Health Protection and Promotion Act (HPPA)* Revised Statues of Ontario, 1990 Chapter H.7, the following sections apply:
  - Physicians and Practitioners (*Section 25*)
  - Carriers of Disease (*Section 26*)
  - Hospital Administrators and Superintendents of Institutions (*Section 27*)
  - School Principals (*Section 28*)
  - Operator of a Laboratory (*Section 29*)
How do I protect myself?

Cover your mouth and nose when you cough or sneeze and encourage others to do the same.

Frequent hand washing can protect you from many illnesses.
How do I protect myself?

- If you are planning to **travel** to a country known to have high rates of TB consider having a TB skin test before and after your trip.

  **Remember:**

- Asia, Africa, India, the Middle East, Central and South America, and the Caribbean have higher rates of TB.
Wearing Mask?

- **Standard surgical masks** are effective in preventing larger exhaled droplets from falling into wounds.
  - However, they are less than 50% effective in filtering the much smaller droplets containing TB that may be breathed in.

- Everyone, *including health care workers, volunteers and visitors*, entering rooms in which the person with suspected or confirmed infectious TB disease need to wear a **N-95 mask**.

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Ontario Ministry of Health and Long-Term Care, 2006
TB Skin Testing

- TB infection can be detected with a simple skin test
- You may be asked to have a TB skin test (TST) for a number of reasons:
  - A new job
  - School
  - Exposure to someone with active TB disease

continued...
TB Skin Testing

- A fluid is injected between the layers of skin, usually on the forearm. This fluid is called PPD (purified protein derivative)
TB Skin Testing

- Return 48 – 72 hours after injection for reading by a health care professional

**Positive Reaction:**
- Indicated by a swollen area at the site of the injection (induration)

**NOTE:**
- This test **must** be read by a health professional with training in how to read a TB skin test
- Redness alone at the site of the test does not indicate a positive result
Positive Skin Test: Now what?

- A positive skin test indicates the TB bacteria has entered the body.
- This can mean **TB infection** or **TB disease**.
- Further tests needed to rule out TB disease. These may include a chest X-ray or sputum sample.

continued...
### Positive Skin Test: Now what?

**INFECTION**
- Positive Skin Test
- TB germ in body, NOT growing
- NOT contagious
- Will have normal chest x-ray
- No symptoms
- May be prescribed meds to prevent disease from developing
- at risk of developing disease in future if left untreated

**DISEASE**
- Positive or Negative Skin Test
- TB germ in body and is growing
- Contagious if in lungs and not properly treated with medication
- Abnormal chest x-ray or evidence of TB in other parts of the body
- Symptoms become more severe over time
- Requires treatment with several meds for 6 months or longer to cure
- Person must be treated to prevent disease from worsening or spreading

Durham Region Health Department offers TB skin tests for people at highest risk of progression to active TB including:

- Recent contacts of an active TB case,
- Individuals who have recently immigrated to Canada, and
- Individuals who are immunocompromised.
TB Testing

- Tuberculin skin testing is available at family doctors offices, walk-in clinics, and Community Health Centres.

- The Ministry of Health and Long Term Care has a Health Care Options Medical Services Directory available online at [www.health.gov.on.ca/ms/healthcareoptions/public](http://www.health.gov.on.ca/ms/healthcareoptions/public) should you require a listing of Medical Services in your area.
Health Department Role

The Durham Region Health Department offers a number of supports related to TB

- TB skin testing clinics
- Free TB medication to persons with latent TB infection (LTBI) and active TB (TB disease)
- Counselling and ongoing support for clients by a Registered Nurse through the duration of medication regime including DOT (Directly Observed Therapy)
- TB education to community stakeholders and health care providers
DOT is delivered by Registered Nurses

Benefits of DOT:
- Encourages successful completion of treatment
- Ensures that the patient keeps doctor’s appointments
- Watch for side-effects and provide information
- Provides opportunity for patient to ask questions
- Improves the likelihood of a permanent cure
- Reduce the likelihood of acquired drug resistance
If you have any questions
contact Durham Region Health Department
Durham Health Connection Line

Tel: 905-666-6241 OR 1-800-841-2729
Fax: 905-666-6216

www.durham.ca
Questions
Resources

- Durham Region Health Department
  905-668-7711 or 1-800-841-2729
  www.durham.ca


Stop Tuberculosis Canada Initiative.
www.stoptb.ca

The Lung Association.
www.on.lung.ca

Think TB If You Work or Volunteer… poster
http://lung.healthdiary.ca/Guest/Product.aspx?IDS=nDfu1xXW%2fP4n4lP9D8tr7g%3d%3d

www.who.int

www.stoptb.org