TB at Edendale Hospital: Operational Guidelines for Doctors and Nurses

Dr. Michael Clark
Medical Officer
Edendale Hospital
The Burden

What?
- Tuberculosis (TB)
- HIV/TB co-infection
- Drug resistance

Where?
- South Africa
- KwaZulu Natal (KZN)
- Edendale Hospital (EDH)
## TB in South Africa (2006)

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( WHO, 2008)
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<th>Country</th>
<th>Children aged 0–14 years</th>
<th>% of TB occurring in children</th>
<th>Estimated TB case rates &lt;15 years of age*</th>
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Total for the 22 high-burden countries: 659,397 | 9.6

* Case rates per 100,000 children. United Nations population estimates used for denominator.
Geographical distribution of estimated HIV-positive TB cases, 2006. For each country or region, the number of incident TB cases arising in people with HIV is shown as a percentage of the global total of such cases. AFR* is all countries in the WHO African Region except those shown separately; AMR* excludes Brazil; EUR* excludes the Russian Federation; SEAR* excludes India.

(WHO, 2008)
### MDR TB in South Africa (2006)

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<th>Rank</th>
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<th>Number MDR-TB Cases</th>
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(WHO, 2008)
TB in South Africa by province (2006)

1076 per 100,000

(Department of Health, 2009)
XDR-TB in South Africa: No Time for Denial or Complacency

Jerome Amir Singh∗, Ross Upshur, Nesri Padayatchi
Extensively drug-resistant tuberculosis as a cause of death in patients co-infected with tuberculosis and HIV in a rural area of South Africa

Neel R Gandhi, Anthony Moll, A Willem Sturm, Robert Pawinski, Thiloshini Govender, Umesh Laloo, Kimberly Zeller, Jason Andrews, Gerald Friedland

Results From January, 2005, to March, 2006, sputum was obtained from 1539 patients. We detected MDR tuberculosis in 221 patients, of whom 53 had XDR tuberculosis. Prevalence among 475 patients with culture-confirmed tuberculosis was 39% (185 patients) for MDR and 6% (30) for XDR tuberculosis. Only 55% (26 of 47) of patients with XDR tuberculosis had never been previously treated for tuberculosis; 67% (28 of 42) had a recent hospital admission. All 44 patients with XDR tuberculosis who were tested for HIV were co-infected. 52 of 53 patients with XDR tuberculosis died, with median survival of 16 days from time of diagnosis (IQR 6–37) among the 42 patients with confirmed dates of death. Genotyping of isolates showed that 39 of 46 (85%, 95% CI 74–95) patients with XDR tuberculosis had similar strains.
Edendale Hospital

• Leading cause of death at EDH (in-hospital statistics)
• Among those who die, 44% do so within 2 days of admission (Alvarez et al., 2004)
• 81% of tested TB patients HIV positive in 2008-09 (TB Team Office)
• 50% of adults 20 – 45 years had culture-proven TB at time of death in post-mortem study (Cohen et al., 2010)
Figure  Kaplan-Meier estimates of probability of in-hospital survival with and without HIV co-infection (PHR 2.68, 95% CI 1.47–4.87, \( P = 0.0008 \)). It was assumed that those discharged survived to 75 days (the longest duration of hospital stay) from admission. Excludes 26 patients with undetermined HIV status. HIV = human immunodeficiency virus; TB = tuberculosis; PHR = proportional hazard ratio; CI = confidence interval.

(Alvarez et al., 2004)
Dr. Wilson: Three months after the patient’s death, a sputum culture that had been obtained during her hospitalization was reported to show *M. tuberculosis* that was resistant to isoniazid, rifampin, ethambutol, streptomycin, kanamycin, and ciprofloxacin.
## TB at Edendale Hospital: Perspective

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<th>Setting</th>
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<th>Number of cases</th>
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<td>Edendale Hospital&lt;sup&gt;3&lt;/sup&gt;</td>
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<td>Canada&lt;sup&gt;4&lt;/sup&gt;</td>
<td>2008</td>
<td>1600</td>
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1. WHO, 2008
2. Department of Health, 2009
3. TB Team Office, EDH
Number of TB cases by month (2008-09)
HIV among tested TB patients (2008-09)
Summary – The Burden

• South Africa
  – Highest TB rate in the world
  – Highest rate of HIV-infected TB cases in the world

• KwaZulu Natal
  – Highest TB rate in South Africa
  – Epicentre of MDR and XDR TB

• Edendale Hospital
  – More TB cases in one year than Canada
  – 50% of all young adult deaths have culture + TB
Diagnosis and Management

Case finding
- Targets
- South Africa
- Edendale Hospital

Treatment success
- Targets
- South Africa
- Edendale Hospital
STOP TB PARTNERSHIP TARGETS

By 2005: At least 70% of people with sputum smear-positive TB will be diagnosed (i.e. under the DOTS strategy), and at least 85% cured. These are targets set by the World Health Assembly of WHO.

By 2015: The global burden of TB (per capita prevalence and death rates) will be reduced by 50% relative to 1990 levels.

By 2050: The global incidence of active TB will be less than 1 case per million population per year.

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South African Targets

• Detect 70% of cases
• 100% bacteriological coverage
• Cure 85% of newly detected SS+ TB cases
• Achieve treatment success in > 85% of cases
• Screen all HIV patients for TB
• Test all TB patients for HIV

(Department of Health, 2009)
(WHO, 2008)
## Treatment outcomes in South Africa (2005)

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<th>Regist'd (%)</th>
<th>Cured</th>
<th>Completed Treatment</th>
<th>Died</th>
<th>Failed</th>
<th>Defaulted</th>
<th>Transferred</th>
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(Who, 2008)
A health systems assessment of the KwaZulu-Natal tuberculosis programme in the context of increasing drug resistance

M. Loveday,† L. Thomson,‡ M. Chopra,† Z. Ndlela†

*Medical Research Council, Tygerberg, †Health Systems Trust, Durban, ‡KwaZulu-Natal Department of Health, Pietermaritzburg, South Africa

RESULTS: Only 18% of those diagnosed with smear-positive pulmonary TB (PTB) in the hospital laboratory completed their treatment and 11% were cured. Clinicians did not adhere to the diagnostic guidelines of the NTP. In the TB register, 85% of PTB cases were diagnosed in the absence of sputum microscopy. Chest X-rays alone were used to diagnose PTB in 45% of the records reviewed. In addition, clinicians failed to document a clinical history suggestive of TB. Only 66 (29%) of the hospital’s 225 smear-positive PTB patients reached the clinics for completion of their treatment.
Bacteriological coverage by quarter (2008-09)

(Health District Office, Umgungundlovu)
Paediatrics

• High burden
  – More outpatient cases than Canada
  – 183 cases in 2009!

• Diagnostic difficulties
  – Gastric washings done once in outpatients
  – No sputum inductions in children < 5 years

<table>
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<th>TB in children aged 0-4 years (2008)</th>
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<td>EDH (outpatients)</td>
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<td>Canada</td>
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* Health Canada, 2009
“Leakage”

(Loveday et al., 2008)
79 Patients are started on TB therapy

- 48 are discharged to home
- 5 are transferred to a TB hospital
- 2 leave against medical advice
- 24 die as inpatients

**Outcome**

**Clinic follow-up**
Approximately 66% report to their nearest local clinic within 30 days of discharge

**Hospital reporting of outcome**
- 36 are recorded as transferred to a local clinic for follow-up in the hospital TB register. 12 are unrecorded.
- 1 recorded as transferred to a local clinic for follow-up in the hospital TB register. 0 are recorded as transfers to other facilities. 4 are unrecorded.
- 1 patient later reports to their nearest local clinic within 30 days of discharge
- 2 are not recorded in the hospital TB register.
- 5 are recorded as transferred to a local clinic for follow-up in the hospital TB register. 0 are recorded as deaths. 19 are unrecorded.

(Audit, 2009)
Proportion of TB cases tested for HIV

(TB Team Office)
Patient Adherence to Tuberculosis Treatment: A Systematic Review of Qualitative Research

Salla A. Munro¹,²,³*, Simon A. Lewin³,⁴, Helen J. Smith⁵, Mark E. Engel¹,⁶, Atle Fretheim⁷, Jimmy Volmink¹,⁸

Themes:
• Organization of care
• Interpretation of wellness
• Financial burden
• Knowledge, attitudes, and beliefs
• Law and immigration
• Personal characteristics
• Side effects
• Family and community

ADHERENCE TO TB TREATMENT IS COMPLICATED!
WHAT CAN WE DO?

• Edendale must be regarded as a country, and not just a hospital:
  – Burden of a developed nation in one institution
  – Tiny fraction of the resources

• Shift to public health focus to control TB:
  – Dedicated, centralized support for Medicine and Paediatrics
  – Leadership for TB control:

TB TEAM
TB Team Organogram

District Office, Umgungundlovu

HAST Committee, EDH

TB PMO, EDH

Head Nurse, TB Team Office

TB Nursing Staff

TB Data Capturer

TB Tracer

TB Clerk

Department of Medicine

Services / Support

Department of Paediatrics

Services / Support
Organization of TB Patient Care

1) Diagnosis
2) Consultation
3) Education
4) Medication
5) Registration
6) Transfer
7) Discharge
1) Diagnosis

DOCTORS

Use guidelines

Smear microscopy
If PTB highly suspected, and patient cannot expectorate sputum

SPUTUM INDUCTION

“Use the warriors”
iTEACH (4523)

TB Team Office
09h00 – 13h00
Monday – Friday
(4663)
PLEASE CALL FIRST!
All sputa sent for AFB / TB MC&S must be recorded for **FOLLOW-UP**

Inpatients: **iTEACH**

Outpatients: **TB TEAM**

“**Suspect**” Register
GW 20/13
Screen all HIV patients for TB

Test all TB patients for HIV
Children

- Use guidelines:
  - Mycobacteriology:
    - Gastric washings
      - Wednesday mornings in POPD (4170)
      - Child must be NPO overnight before
    - Sputum induction
      - Remember that older children often expectorate
      - SI currently done in children aged 5+ years (4663)
  - Risk assessment:
Complicated cases

• Mono-resistance?
• Drug-induced hepatitis?
• IRIS?
• Complicated drug interactions?
• Sequelae (TBM, pericarditis)?

Speak with senior doctor
Or TB PMO (6318)
2) Consultation

DOCTORS

Clinic/Hospital Card
GW 20/12
“BLUE CARD”
TB STARTER PACK

These are supplied to the wards by TB TEAM (4663)
REQUEST FOR CONSULTATION
VERSOEK OM RAADPLEGING

To Dr. TB TEAM

Aan Dr. HOSPITAL

Name of Patient: SIYABONGA NDLOVU

Age: 35

Ward: 5F

Department: Afdeling No.

Can Patient attend at Consultant's office?

Kan pasiënt die konsultande geneesheer se kantoor besoek?

Brief Clinical history (including X-Ray and other reports)
Kort kliniese geskiedenis (insluitende K-opname en ander verslae)

* PATIENT NEWLY DIAGNOSED WITH TB

Date: 16/4/2010

Signature of Medical Officer: [Signature]

Date: [Signature]

Examination requested:
Onderzoek verlang:

Report and recommendations:
Verslag en aanbevelings:

Date: [Signature]

Department of Medicine
Record of TB TEAM Consultations
Collect from TB TEAM box

Record name, ID and date in TB TEAM record book
3) Education

TB TEAM

You have been diagnosed with TB

TB is an infection that is
carried through the air, and
makes people cough.

Do not leave the hospital
until you receive a 1-month

treatment (Rifabutin or ARTs).

You need to take TB

treatment for at least

6 months to cure your TB.

You will start to feel better

soon, but you must keep

taking your treatment.

You must pick up TB

treatment every month

in your local clinic.

SIDE EFFECTS:

You might have side effects from
your TB treatment. Go to the clinic
if you have nausea, vomiting,
abdominal pain, yellow eyes, or
rashes (especially if it fever)

If you stop taking your drugs

more than 1 week, you might

lose your TB treatment.

If there is anyone at home

who is coughing, they need

to go to the clinic and get

tested for TB.

Uthokakale ulinzi uhezi noluha (TB)

TB info.

gyadzisayo

mugadza zveva zimhando.

Ukugore milive uine

unogona uhusi uhezi. Uhezi

diTB khokho akadzine

ugadzisayo. Vinesi

ugadzisayo EFV/3TC.

Ulinga ukugore uhezi

ugadzisayo. Ifayi migadzisayo

mugadza zveva zimhando.

Ungwana unogona mumi,

kutse u'UNGWANERO.

Kutse dire uine,

unogona uhezi diTB

khokho akadzine. Uhezi

ugadzisayo EFV/3TC.

Siyobva dzimwe kugadzisayo

mugadza zveva zimhando. Uhezi

diTB khokho akadzine.

Rashidzwa uhezi

ugadzisayo. Ifayi migadzisayo

mugadza zveva zimhando.

Ungumvayo uhezi

ugadzisayo. Ifayi migadzisayo

mugadza zveva zimhando.

Kutse dire uine,

unogona uhezi diTB

khokho akadzine. Uhezi

diTB khokho akadzine.

Uninga uhezi, uhezi

ugadzisayo. Ifayi migadzisayo

mugadza zveva zimhando. Uhezi

diTB khokho akadzine.
TB TEAM BAG

Record book

Red stickers

Education tool

TB anywherely is TB everywhere.

Stop the spread of TB now!!

Coughing for two weeks means you have to go to the local clinic and set a free TB test. Make sure you cover your mouth with a cloth every time you cough!
4) Medication

Look inside	“BLUE CARD”

Patient Treatment Card
GW 20/15
“GREEN CARD”

PRESCRIPTION FOR TUBERCULOSIS MEDICATIONS
EDENDALE HOSPITAL

NOTE: A prescription must also be written in the patient's hospital record.

DATE: 16/5/2010

PATIENT'S NAME: [Name]
ADDRESS: [Address]
SEX: [Sex]
AGE (years): [Age]
HOSPITAL NO.: [No.]

WEIGHT (kg): 59

SURNAME: [Surname]
FIRST NAME: [Name]
REGISTRATION NO.: [No.]

DURATION:

CONTINUATION PHASE

TB PRESCRIPTION
Dosing

- See **TB PRESCRIPTION**
  - Adult and childhood dosing
  - Record for doctors and pharmacists
  - Follows patient to PHCs
- Questions about dosing?
  - Pharmacy (4317)
  - Senior doctor or TB PMO (6318)
5) Registration
6) Transfer

- 1) MDR TB patient
  - Call **TB TEAM** (4663)
  - Transfer to **Doris Goodwin Hospital**, with:
    - “Pink form” and doctor-to-doctor LETTER!
    - Copies of results (including HIV tests) and CXRs

- 2) Stable TB patient – needs inpatient care
  - Call **TB TEAM** (4663)
  - Transfer to **Richmond TB Hospital**, with:
    - “Pink form” and doctor-to-doctor LETTER!
    - Copies of results (including HIV tests) and CXRs

- 3) Stable TB patient – discharging home...
Transfer to PHC is vital!

Patient Referral Form
GW 20/14
“PINK FORM”

TB TEAM

EDH

PHC
7) Discharge

At the time of discharge, please look for this in the patient file
DOCTORS

Please ensure patient has been seen by TB TEAM before discharging!
If you have questions, call 4663
Sticker indicates **TB diagnosis** made in hospital

This is a reminder to ensure that:

1) **Medication** has been dispensed
2) **Transfer** to clinic has been arranged for patient
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QUESTIONS?

• Diagnosis?
  – Senior doctor or TB PMO (6318)
  – Sputum?
    • Inpatients: iTEACH (4523)
    • Outpatients: TB TEAM (4663)

• Medications?
  – Pharmacy (4137)
  – Senior doctor or TB PMO (6318)

• Anything else?
  – TB TEAM (4663)

ESPECIALLY IF YOU ARE UNSURE ABOUT SOMETHING AT THE TIME OF DISCHARGE
References

- Gandhi NR et al. NEJM. 2006;368:1575-80.
- Wilson et al. NEJM. 2009;360:2456-64.