

TLALELETSO

Infection Control

This issue is focused on how to protecting health care workers from contracting TB.

INTRODUCTION

Health care workers are at increased risk of tuberculosis infection and disease compared to the general population, as demonstrated in two recent systematic reviews of studies conducted in low and middle-income countries (1). Non-medical workers and patients in health care settings are also at increased risk. Employees and patients with HIV infection are particularly vulnerable to acquiring TB and developing (2) active disease.

In health facilities, persons with potentially infectious tuberculosis may be present at any site including: HIV clinic, maternal and child health clinics, general outpatient departments and inpatient medical wards. If these patients are undiagnosed and untreated, especially under conditions of overcrowding or poor ventilation, transmission of M. Tuberculosis among HCWs and patients is of great concern.

In countries with high TB prevalence, like Botswana, high TB prevalence in the community and high background rates of tuberculin skin test positivity make identification of new TB infections difficult. Furthermore, distinguishing transmission of TB in health care settings from community acquired TB is difficult. However, reductions in health care setting-related TB exposure may be achievable with effective occupational health and infection control policies and practices.

Notes from the Editor.....

Tlaleletso is a monthly publication produced by the Botswana UPenn Partnership, in response to your expressed need for accessible, digestible clinical information.

In this issue we focus on the importance of infection control at health facilities...

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The World Health Organization has developed 'Ten Essential Actions for Effective TB Infection Control' to guide the design and implementation of infection control interventions in resource limited settings. These ten actions are summarized below. One goal of the package is that there be 'safety without stigma.' Thus health care workers and patients should be encouraged to practice infection control without feeling self-conscious or embarrassed.

Ten Essential Actions for Effective TB infection control:

- 1. Include HCWs, patients and communities in advocacy campaigns:** Community education should include not only aspects of TB infection, prevention and control, but also aspects of what HCWs and patients might do to protect themselves. For example, HCWs may wear masks or ask patients to wear masks, patients may be asked to produce sputum specimens outside or coughing patients may be asked to wait in separate waiting areas. HCWs, patients and communities should be educated to understand that TB control means safety for all.
- 2. Develop an infection control plan:** Facilities should have a designated committee or staff person to develop and implement infection control plans. This designate should review environments in a systematic fashion and create plans for improving conditions.

Educate! Cough Hygiene is vital...



Educating patients about the importance of cough hygiene is essential. If they have a cough, suggest that they use a hankkerchief, a tissue on their elbow!

3. **Protect Health care workers:** HCWs should be offered standard advice. They should all have access to N95 Respirator masks, be regularly screened for TB and have access to HIV counseling and testing. Discrete opportunities for HIV treatment for those that test positive for HIV is also essential. Most importantly HCWs, need to work within a structure that supports the ethic of safety without stigma and allows them to act on the ten essential elements described here.
4. **Capacity building:** Hospital or facility wide infection control policies and practices should include explicit training modules on TB infection control.
5. **Monitor infection control practices:** Finally, WHO recommend that mentorship s to facilities is vital and should include review of infection control plans and practices.



The three components of good infection control practice are:

1. Administrative measures – like separating coughing patients from everyone else.
2. Environmental measures – like making sure windows are always open
3. Persona protective measures – like wearing your N95 mask all of the time!

6. **Ensure safe sputum collection:** Sputum should be collected outside or in a specially ventilated area.
7. **Promote cough etiquette and cough hygiene:** Posters should be posted and hospital staff should educate patients. Tissues and proper disposal modalities should be made available and patients should be strongly encouraged to use them. If tissues are not available, coughing into a rag or cloth is preferable to an uncovered cough.
8. **Triage TB suspects for ‘fast track’ or separation:** Rapid triage and separation of coughing patients are essential to effective infection control. Although triage might be viewed by other patients as ‘jumping the queue’ patients should be educated about the necessity of reducing TB transmission. In particular, coughing patients should be seated in areas of good ventilation and sunlight whenever possible.
9. **Assure rapid diagnosis and initiation of treatment:** This element requires that all pieces of TB diagnosis and treatment systems are functional and efficient. In particular, sputum smear turnaround times should be 24 hours or less. Patient tracking systems should be able to cope with both smear positive patients (for rapid treatment initiation) and smear negative patients (for additional testing, such as chest x-ray and other procedures/referrals.)
10. **Improved ventilation:** Achieving good ventilation should be a priority. Simple interventions (such as opening doors and window), room fans and use of outside waiting areas should be maximized. Knowledge of infection control, air flow and patient flow should be utilized during renovation planning to ensure optimal benefit.

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ACTION!**The importance of Administrative Measures**

Administrative measures reduce the production of TB particles in health facilities. The following administrative controls should be implemented in all health facilities, including in sections that do not specifically address TB.

Screening of clients for cough as they enter the facility

In order to reduce the production of TB particles into the environment, clients who are coughing need to be identified as early as possible. Clients can be asked for a history of coughing, or can be observed. The sooner coughing clients are identified, the fewer TB particles will be released into the facility.

The best place to identify coughing clients is in the client reception or waiting area. A staff member, such as the reception clerk or triage person, should be assigned responsibility for this task. Clients should be asked in a gentle manner if they cough and a poster promoting client disclosure of coughing should be placed in the reception area.

Coughing patients can be given priority to receive faster medical consultation or investigations in order to reduce their time in the waiting areas. If not possible, a separate, well-ventilated or open area should be made available for coughing clients. They should be instructed on cough hygiene (see below).

TB is a highly stigmatised disease and this should be kept in mind when identifying coughing patients. Client confidentiality should be maintained.

Education of clients in cough hygiene

When you cough into the air or into your hand, germs (including TB) are likely to spread. If someone is coughing, it is better if they cough into a piece of cloth, a tissue or a paper mask to trap the TB droplet.

Tissues and paper masks should be made available in the waiting room. These should be disposed of once used in a dustbin. If such physical barriers are not available, the mouth and nose should be covered during cough with the bend of the elbow or hands, which must then be cleaned immediately. Such cough hygiene also applies to health workers, visitors and families. All clients should be educated on proper cough hygiene in the health facility, in public and at home.

Triaging of coughing patients

All patients should be screened routinely upon arrival for coughs lasting longer than two weeks, fever, weight loss and night sweats. People suspected of having pulmonary TB should be "fast-tracked" for rapid diagnosis and any health services which they need. This means that the coughing person leaves the clinic earlier and fewer TB or other germs will be released into the air.

If the main reason for the person visiting the healthcare facility is not because of their cough (such as infant immunisation, family planning etc.), they should receive these first without waiting and then be investigated for cough.

Healthcare workers should explain to patients that the fast-tracking system is for the safety of all people and that the goal is to reduce the chances of the transmission of TB and other diseases. Posters in the waiting area should encourage patients to let staff know if they are coughing and indicate that waiting times will be shorter. This will decrease frustration when coughing clients appear to 'jump' the queue.

Safe sputum collection

Sputum collection can be very risky in terms of TB transmission and should be done in a safe environment. The safest environment is outdoors, as this provides the best ventilation and natural sunlight. The client should have access to a private space to cough sputum, and to running water for washing their hands afterwards. Sputum booths can provide privacy but should be well ventilated.

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Ventilation - What about ventilation?

Health facility waiting areas and consultation rooms should be well ventilated. Ventilation means that there is a place where fresh air can enter the building and stale, infected air can leave the building. This removes infectious particles, and dilutes those that remain. This decreases the chances of people inhaling infectious particles. Ventilation can also control the direction of air flow, so that air flows from less contaminated to more contaminated areas.

Waiting areas for all clients should be chosen on the basis of the degree of ventilation available in that area. This may mean shuffling areas in your health facility to ensure that the TB and HIV sections have the best ventilation and that there is good ventilation in waiting areas.

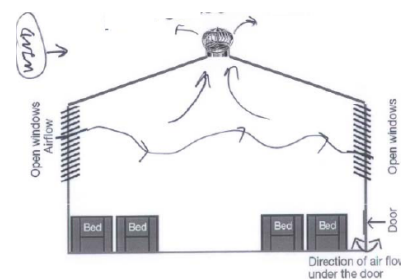
Natural ventilation is always better than mechanical ventilation as mechanical ventilation is expensive, requires a constant power supply and may break down, which often takes a long time to repair due to budget constraints. Mechanical ventilation systems should only be considered in well-established settings which have a constant electricity supply, where trained maintenance staff are guaranteed and where there is access to parts in case of repairs.

In cases where mechanical ventilation is used, a staff member should be assigned to check daily that the ventilation equipment is working. Cross-ventilation, where there are two openings opposite each other to allow air flow, is the most effective. Outdoor waiting areas which are covered for protection from the rain, heat and sun are the most ideal. It is important to engage with your Ministry of Health to advocate for changes in your building to ensure better TB infection control, even if it means simple renovations to the building.

The direction of the airflow and the level of ventilation should be assessed in your facility and

improved, where possible. Draw a floor plan of your clinic, which includes a marking for where the windows and doors are. To assess circulation and dilution of air in different areas of the facility do the following:

- Light an incense stick, and extinguish the flame as soon as it burns. The stick should be smoking.
- While normal activities are happening in the facility (i.e. during working hours, and with windows as they normally are (i.e. closed or open), take the incense stick to every area of the facility.
- In each area, on your plan of the facility, make a note of: a) the direction of smoke, b) the speed at which smoke is moved. If smoke does not move, write an 'O' in that area; c) if smoke does move, use +/++/+++ to mark how quickly the smoke is swept around the room. This is particularly important in the waiting areas, and in the consultation rooms.





What is the role of masks in preventing TB?

Surgical masks for patients

Surgical paper masks do not stop TB particles from being inhaled, but they do stop TB particles from being released into the air. Surgical paper masks should not be worn by healthcare workers, but by patients. This will prevent TB from entering the air and people from becoming infected with TB.

Only advising that coughing or TB patients wear surgical paper masks can be stigmatising. Some patients may be unwilling to wear masks, but explain to them that by wearing paper masks, they are protecting all patients and their families, and fellow patients are in turn protecting them from TB. However, surgical masks are relatively cheap and should be part of every TB infection control plan, where possible.

N95 respirators for healthcare workers

N95 respirators are different from surgical paper masks in that they stop particles from being released into the air and they protect the wearer from inhaling any TB droplets. The World Health Organization recommends that all staff working in high-risk roles in healthcare facilities should wear N95 respirators.



Staff should be trained on how to wear N95 respirator masks properly. A mask will provide no protection if it is not properly fitted, as air will flow through gaps between the mask and the wearer's skin. Fit-tests should be done when selecting the type of mask that your facility uses as variability in facial structure can mean that different types of masks fit better. Any facial hair, such as beards or long sideburns, may prevent the respirator from fitting properly.

Health care worker-oriented TB infection control at a glance

- Recognize TB and HIV as workplace issues
- Create health care worker awareness of the need to self-protect and protect clients: safety without stigma
- Provide safe avenues for health care workers to obtain TB and HIV screening, diagnoses and treatment
- Ensure non-discrimination and respect confidentiality
- Provide health care workers with mentorship and supportive supervision in the areas of infection control and self-protection.
- Implement rapid triage of TB suspects, cough hygiene and environmental controls whenever possible.

CONCLUSION

It is vital that health care workers understand the importance of simple interventions outlined above to reduce the risk of TB transmission. Implementation of the measures outlined in this issue of *Tlaleletso* is necessary to ensure the best chances of preventing the transmission of TB.

Wearing N95 respirators is a valuable form of personal protection against TB. Health care workers should also know their HIV status, since HIV-infected staff are at increased risk of acquiring TB.

A lack of understanding of the risks of being infected with TB by patients and staff is often the greatest barrier to the implementation of TB infection control.



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