



CHEST RADIOGRAPHY IN TUBERCULOSIS DETECTION



ABOUT CHEST RADIOGRAPHY

X-ray based examinations are crucial in a variety of medical setting and at all major levels of health care. Chest radiography, or chest X-ray (CXR) is a rapid imaging tool that allows for easy identification of lung abnormalities. CXR is an essential tool for early detection of tuberculosis (TB), and therefore fundamental to achieving the targets set out in WHO's End TB Strategy.. CXR has high sensitivity, but limited specificity for detecting pulmonary TB. It is therefore especially suitable for TB screening and triaging. Recommendations on CXR in TB detection are included in several WHO policies, summarized below.

CHEST RADIOGRAPHY: AN ESSENTIAL TOOL TO END TB

CXR IS A SENSITIVE TOOL FOR SCREENING FOR ACTIVE TB

[Reference: Guidelines on systematic screening for active TB](#)

- CXR has higher sensitivity for pulmonary TB than screening for TB symptoms.

AN ABNORMAL CXR IS AN INDICATION FOR FULL DIAGNOSTIC EVALUATION

[Reference: The International Standards of TB Care](#)

- All patients with unexplained findings suggestive of TB on CXR should be evaluated for TB with a bacteriological diagnostic test.
- CXR can be used as a supplementary diagnostic aid, although the specificity is low.
- A bacteriologically-confirmed diagnosis is always preferred.

CXR IS AN IMPORTANT TOOL FOR CHILDHOOD TB DIAGNOSIS

[Reference: Guidelines on childhood TB](#)

- CXR is useful in the diagnosis of pulmonary and extrapulmonary TB in children, in combination with history, evidence of TB infection and microbiological testing.

CXR CAN IMPROVE THE EFFICIENCY OF XPERT MTB/RIF USE

[Reference: Implementation manual on Xpert MTB/RIF](#)

- CXR and further clinical assessment can be used to triage who should be tested with Xpert MTB/RIF in order to reduce the number of individuals tested and the associated costs, as well as to improve pre-test probability of TB and thus the predictive value of Xpert MTB/RIF.

CXR CAN ASSIST THE DIAGNOSIS OF TB AMONG PEOPLE LIVING WITH HIV

[Reference: Consolidated guidelines on the use of ARV drugs for treating and preventing HIV infection \(forthcoming publication\)](#)

- CXR can assist the diagnosis of TB among people living with HIV. It is particularly useful to rule out TB disease before the provision of treatment for latent TB.

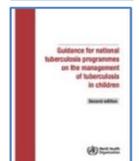
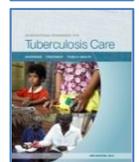
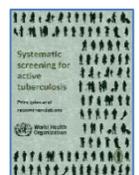
CXR HELPS RULE OUT ACTIVE TB BEFORE TREATING LATENT TB INFECTION

[Reference: Guidelines on management of latent TB infection](#)

- CXR in combination with symptom screening has the highest sensitivity for detecting TB and thus should be done to exclude active TB before initiating treatment of latent TB infection.
- Individuals with any radiological abnormality or TB symptoms should be investigated further for active TB and other conditions.

CXR IS AN ESSENTIAL TECHNOLOGY FOR PREVALENCE SURVEYS

[Reference: Guidelines on TB prevalence surveys](#)



OUTCOMES OF A GLOBAL CONSULTATION ON CXR IN TB DETECTION

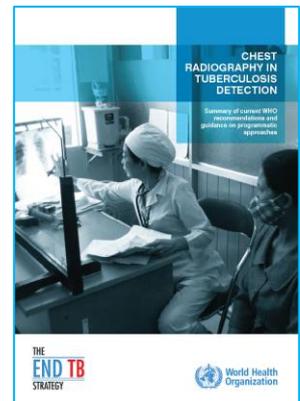
WHO organized a global consultation in September 2016 to:

1. Finalize a document that summarizes current WHO recommendations and provides guidance on programmatic approaches for the use of CXR in TB detection;
2. Perform a review of available evidence on computer-aided radiographic TB detection, and determine if WHO guidelines should be developed.

1. Summary document on WHO's CXR recommendations and guidance on programmatic approaches

The document "[Chest radiography in tuberculosis detection – Summary of current WHO recommendations and guidance on programmatic approaches](#)" was published in October 2016 and provides guidance in the following areas:

- Chest radiography as a triage tool.
- Chest radiography as a diagnostic aid.
- Chest radiography as a screening tool.
- Technical specification, quality assurance and safety.
- Strategic planning for use of CXR in national TB control.



2. Scoping the evidence on computer aided detection of TB

Computer aided detection (CAD) software can analyze digital CXR images for abnormalities, including abnormalities associated with pulmonary TB. A systematic review of published and unpublished studies (identified by June 2016) concluded that the evidence on CAD's diagnostic accuracy is limited by the small number of studies, many of which have important methodological limitations. Based on the review findings and discussions in the expert consultation, WHO has recommended that CAD should be used only as part of research designed to contribute to the required evidence base for future guideline development.

For more information, see <http://www.who.int/tb/chestradiography>

MOVING FORWARD

WHO is planning the following actions:

- Stimulate research to determine the accuracy of CXR as part of different screening, triaging and diagnostic algorithms.
- Develop consolidated guidelines on diagnostic algorithms, which provide recommendations on how to combine CXR, bacteriological tests and clinical assessment for optimal TB diagnosis in different epidemiological situations.
- Develop further specification of the desirable characteristics of CAD for TB detection and advice on appropriate study designs to address key research questions.



For more information please access
www.who.int/tb

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