



Managing the Patient's Response to TB Treatment

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Has the following disclosures to make:

- No conflict of interests
- No relevant financial relationships with any commercial companies pertaining to this activity



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Managing the Patient's Response to TB Treatment

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(Slides Resourced from Maricela Zambrano, PHR 11 and Mary Menix, PHR 7)



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Objectives

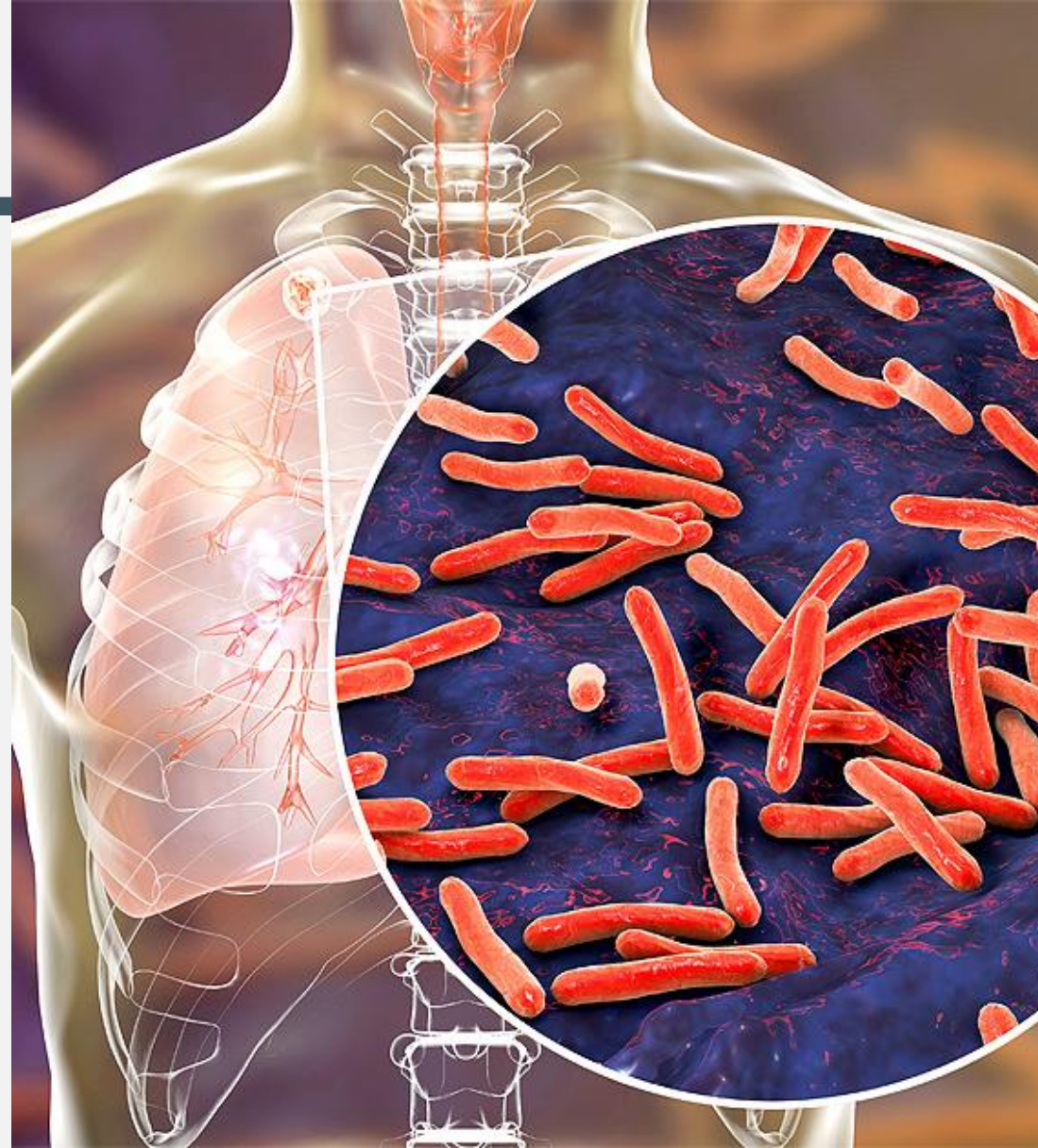
By the end of this presentation, you should be able to:

- **Determine the patient's response to TB Treatment:**
 - ✓ Clinical response
 - ✓ Bacteriologic response
 - ✓ Radiographip response
- **Identify reasons why there is NOT a response to treatment.**
- **Identify next steps when the TB patient is not responding to TB treatment**
 - ✓ Assess adherence
 - ✓ Identify adverse reactions
 - ✓ Draw serum blood levels
 - ✓ Repeat susceptibility testing
 - ✓ Expert Consultation



Goals of TB treatment

- **CURE patient while minimizing risk for temporary or permanent disability and/or death**
- **provide the safest and shortest effective patient centered therapy possible**
- **develop a treatment and monitoring plan to ensure adherence and completion of treatment**
- **protect community from transmission**





Pulmonary+ Tuberculosis

NURSING CARE PLAN

Administrative/Programmatic

Reporting
Contact investigation
Isolation Requirements
Treatment Response

Nursing Process & Diagnosis

Psychosocial	Nutrition
Oxygenation	Safety
Activity	Elimination
Self Perception	Comfort



Use your Resources/different formats

Texas Department of State Health Services
Tuberculosis and Hansen's Disease Section

Tuberculosis Case Management Care Plan

Patient's Name/DOB: _____ Initial Report (Date/Source): _____
Nurse Case Manager (NCM): _____ Licensed Healthcare Provider (LHP): _____

Directions: This checklist can be used by the NCM to ensure case management activities for patients with known or suspected drug susceptible TB are complete. NCMs should initial when each activity is completed. The referenced [DSHS TB forms](#) contain key information for each activity. Programs may use an alternative form or electronic health record (EHR) template that contains equivalent information. *NOTE: for patients with drug resistance, use form TB-701.*

Refer to the [DSHS TB Standing Delegation Orders \(SDOs\)](#) and the [Texas TB Manual](#) for detailed information on these case management activities.

Treatment Months		0	1	2	3	4	5	6	9	12
Weeks				8				26	39	52
Activity	Details									
Responsibility	Assign NCM and identify LHP and other team members. TB-201	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Obtain consents* as indicated:									
Consents	General L-36	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Acknowledgement of Understanding TB-409	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Hurricane Questionnaire TB-209	☐	☐	☐	☐	☐	☐	☐	☐	☐
	HIPAA	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Medical Information Release L-30									
	• Obtain if requesting and sharing medical information with other providers.	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Health Authority Control Order Issue TB-410	☐	☐	☐	☐	☐	☐	☐	☐	☐
	TB Medication Consent TB-411									
Education	• Obtain before treatment initiation and anytime a drug is added to the regimen.	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Client/DOT Provider Agreement TB-206	☐	☐	☐	☐	☐	☐	☐	☐	☐
	• Sign monthly (patient and DOT staff).	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Video-DOT Client Agreement 12-15762	☐	☐	☐	☐	☐	☐	☐	☐	☐
	*Indicate when an interpreter used for obtaining consent.	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Provide initial and ongoing patient education and counseling. Document monthly or more frequently. TB-203/TB-204	☐	☐	☐	☐	☐	☐	☐	☐	☐

Table 18: Milestones and Nursing Interventions for TB Patients

Timeline	Milestone	Nursing Intervention
At diagnosis/ initial report	Patient should be aware of plan of care and understand their current TB status. Patient should have specimen collected as per DSHS SDOs to ensure TB diagnosis and successful treatment can be achieved. <i>Note: NCMs must work with hospitals and laboratories as necessary if initial specimen is collected outside the PHR/LHD.</i>	Sign necessary consents and discuss plan of care. Provide TB case management plan and discuss any barriers; partner with patient as necessary to develop a plan that promotes successful treatment. Collect and/or coordinate with diagnostic laboratory to ensure specimen is tested for <i>M. tb</i> per SDOs and/or LHP order. If testing was performed by an external/hospital laboratory, proactively communicate to ensure the specimen is available for necessary TB testing (i.e., NAA, smear, culture, DSTs). If necessary, request specimen be submitted to DSHS Laboratory.
After 5 DOT doses of adequate therapy	<i>Earliest</i> possible timeframe to release from TB isolation if the patient <u>never</u> had a positive sputum smear result (as well as other factors). Refer to DSHS SDOs and the TB Isolation and	Review bacteriology results, adherence to DOT, and any change in symptoms. If ready for release from isolation, contact the LHP for order. Remind patient about TB isolation procedures and use of

Pulmonary Tuberculosis Nursing Care Plan Samples



Pulmonary Tuberculosis Nursing Care Plan Sample

Sample 1

Nursing Diagnosis: **Ineffective Airway Clearance** related to presence of bronchial infection and secretion.

Assessment	Nursing Diagnosis	Expected Outcomes	Nursing Interventions	Rationale	Evaluation
Subjective: "I have had this recurrent cough for almost a month now, and it seems to be getting worse. I feel short of breath at times and get tired easily. I have lost my appetite and some weight. At night, I wake up sweating and often feel chills." Objective: - RR = 24 breaths/min - PR = 98 beats/min - T = 37.8°C - BP = 110/70 mmHg - SpO₂ = 94% on room air	Ineffective Airway Clearance related to excessive mucus production	After 8 hours of nursing care, the patient will demonstrate effective airway clearance, as evidenced by readily expectorating secretions.	1. Implement strict airborne precautions, including N95 mask use, hand hygiene, negative-pressure isolation (if hospitalized), and patient masking when in shared spaces. 2. Position the patient in High-Fowler's position (head elevated 45–90 degrees) and	1. TB is transmitted via airborne droplets; strict precautions prevent nosocomial transmission and protect healthcare workers and other patients (WHO, 2024). 2. Enhances lung expansion, improves ventilation-perfusion matching, reduces work of breathing, and	After 8 hours of nursing care, the goal is partially met, as the patient effectively expectorated secretions but continues to experience intermittent dyspnea, requiring ongoing management.

Tuberculosis Nursing Care Plan

Assessment and Diagnosis-

- Symptom assessment, laboratory results, radiologic results, risk factors
- Example- impaired respiratory status due to mycobacterium tuberculosis

Tuberculosis Nursing Care Plan

Goal planning

- Patient will be **80%** adherent to therapeutic drug regimen, experience symptomatic improvement, and AFB smear conversion within **30** days.
- Bacteriology will demonstrate AFB culture conversion within **2** months and maintain negativity at completion of treatment.
- Radiographic stability within **2** months and improved upon **completion** of treatment.
- Patient will demonstrate tolerance of treatment and be free of adverse effects.
- Patient will be assessed for psychologic and social obstacles to care at each encounter.

Tuberculosis Nursing Care Plan

Interventions

- Administer and monitor compliance of prescribed approved therapeutic treatment regimen via in-person DOT/VDOT with toxicity assessment
- Collect sputa x 3 (>8hr<24) for AFB smear every **2 weeks** until smear conversion, **monthly** until culture conversion, and **within 30 days** of completion of treatment
- Perform **monthly** and prn symptom and toxicity assessment to include CBC, CMP, additional laboratory and therapeutic drug monitoring prn
- Coordinate **baseline** 2vCXR, at completion of **2** months of treatment and within **1** month of completion of treatment

Tuberculosis Nursing Care Plan

Evaluation-Met or Unmet Goals

- DOT/VDOT adherence levels
- Symptom improvement and Smear conversion
- Culture conversion
- Toxicity assessments negative
- Psychosocial stability

Treatment Regimens:



RIPE - 6 months vs 9 months

4 HPMZ – shorter regimen than RIPE

SHINE - pediatrics

Adherence Monitoring



Video directly observed therapy (vDOT) provides flexibility during TB treatment, saving time and costs



CDC recommends vDOT as an equivalent alternative to in-person DOT



bit.ly/mm7212a4
MARCH 31, 2023

MMWR

Direct Observation of Therapy

In Person

Synchronous

Asynchronous –(reviewed within 24 business hours)

Dose Counting Methods

Calendars

Spreadsheets

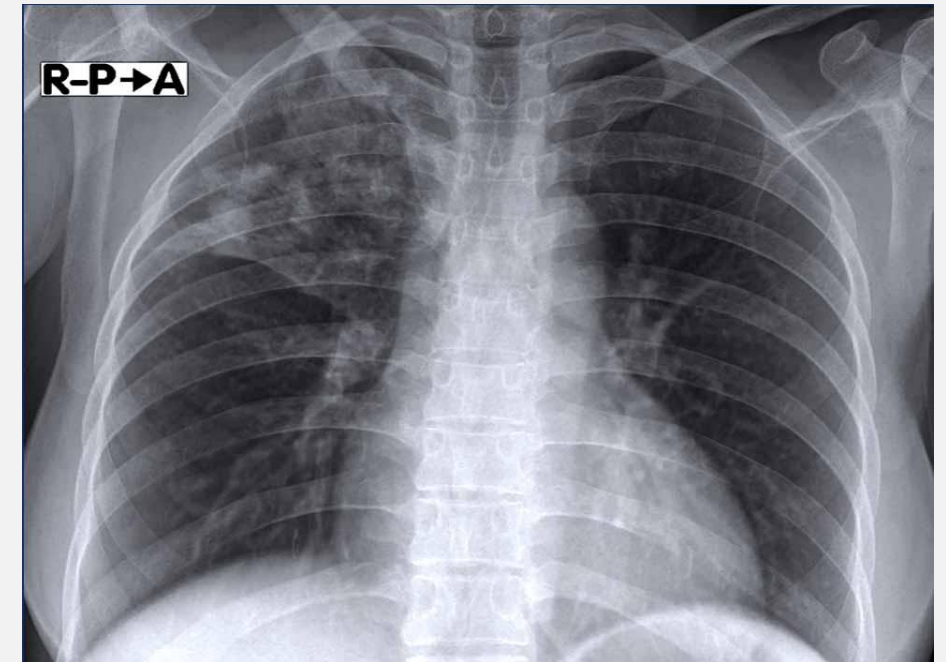
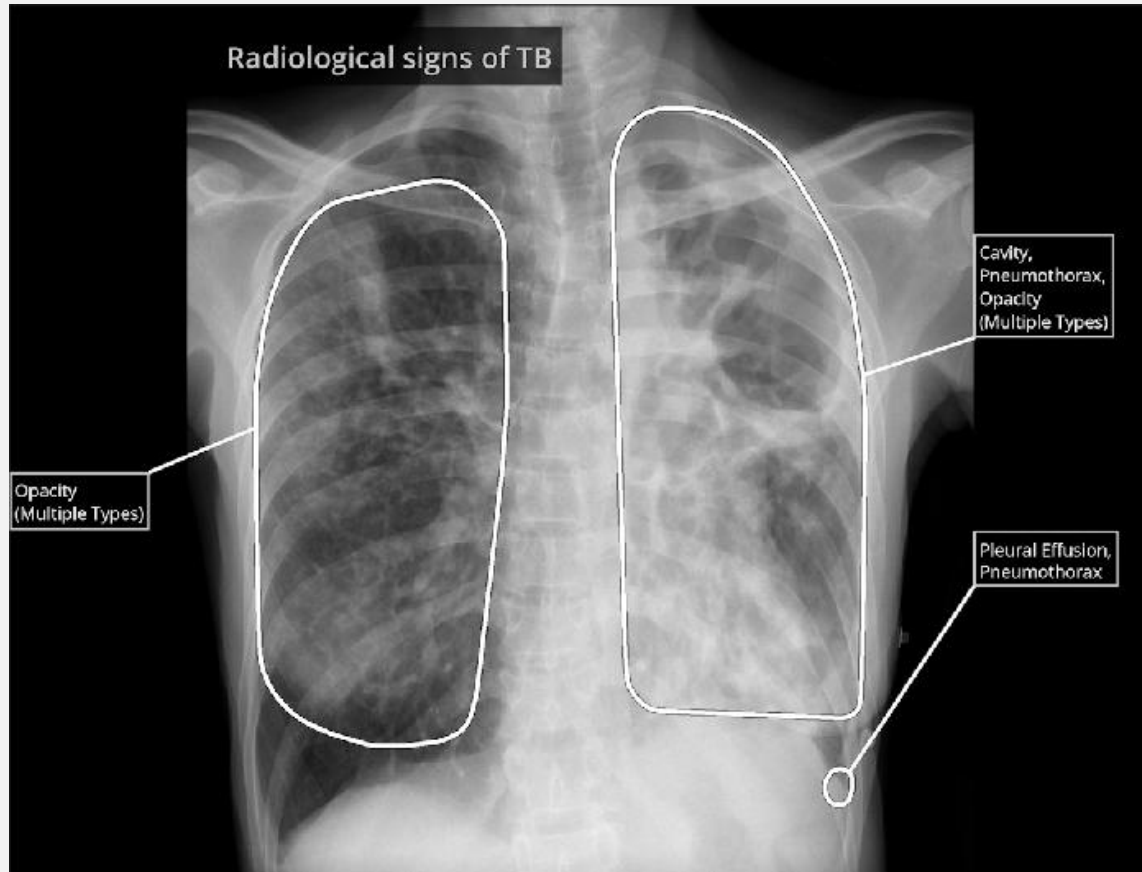
Electronic Health Record

Determining Clinical Response to treatment

- **Clinical Evaluation:**
 - **Symptom improvement**
 - Resolution of S/S
 - Weight gain
 - Overall improvement
 - **Bacterial Examination**
 - AFB smear results
 - Smear & culture conversion
 - Susceptibilities
 - **Radiographic Results**
 - CXR
 - **Extrapulmonary TB**
 - May require additional testing.

[illegible]

Individualized Response to Treatment



<https://radiologyassistant.nl/chest/tb/tuberculosis>

Source: https://www.researchgate.net/figure/An-example-of-a-chest-radiograph-of-a-patient-with-confirmed-pulmonary-tuberculosis_fig2_381092494

Treatment Response Monitoring

REPORT CARD

Symptom

Bacteriology

Radiology

A
B
A
B

Is treatment working?
Is patient getting better?
How do we know?
What measures?

Medical and Nursing Goals:

30 days- symptomatic improvement AFB smear conversion
8 weeks- bacteriologic AFB culture conversion and radiographic stability
6, 9, or 12- months remain AFB culture negative, radiologic improvement
All the time- tolerance of treatment, be free of adverse effects.
Psychologic and social obstacles to care assessed and addressed

REPORT CARD

F

Treatment
Failure!

Treatment Response Monitoring - Symptoms

Symptoms of active TB disease:



Cough lasting
3+ weeks



Coughing up blood or
sputum (*phlegm from
deep inside the lungs*)



Chest pain



Weakness
or fatigue



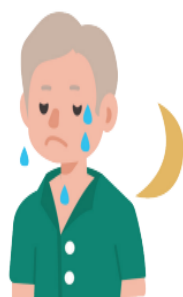
No appetite



Weight loss



Fever and/or chills



Night sweats

Bacteriology Date	Smear	Measure	Culture	Source
3/19/2026	Positive	<1/field	positive	Sputum
3/19/2026	Positive	<1/field	positive	Sputum
3/20/2026	Positive	<1/field	positive	Sputum
3/24/2026	Negative		positive	Sputum
3/25/2026	Negative		positive	Sputum
3/25/2026	Positive	<1/field	positive	Sputum
3/31/2026	Negative		positive	Sputum
3/31/2026	Negative		positive	Sputum
4/1/2026	Negative		positive	Sputum
5/1/2026	Negative		negative	sputum



Treatment Response Monitoring-

Bacteriology

Sputum and Bacteriology Collection Thresholds

Three consecutive sputum specimens

>8<24 hours apart, one observed and early morning

Preferably at time of or prior to drug start date

Collection at **initiation of care** for **all** patients and

if **initial series of three** are Positive- Collect every two weeks until smear conversion

Collect monthly until culture conversion

End of Treatment Specimens

Collect **one final early morning** specimen

MDR-TB

At least one specimen in early morning **monthly** until end of treatment

Extrapulmonary TB Disease

Attempt to collect **three** consecutive specimens even if CXR is normal

Treatment Response Monitoring-

Bacteriology

Bacteriology Date	Smear	Measure	Culture	Source
2/10/2026	Positive	<1/field	positive	Sputum
2/11/2026	Positive	<1/field	positive	Sputum
2/12/2026	Positive	<1/field	positive	Sputum
2/24/2026	Negative		positive	Sputum
2/25/2026	Negative		positive	Sputum
2/25/2026	Positive	<1/field	positive	Sputum
3/4/2026	Negative		positive	Sputum
3/5/2026	Negative		positive	Sputum
3/6/2026	Negative		negative	Sputum
4/11/2026	Negative			sputum
4/12/2026	Positive			sputum
4/13/2026	Negative			sputum

In this scenario:

- RIPE therapy since 2/10/2026.
- 100% compliant with DOT/VDOT
- Symptom improvement

What goals are being met?

What now?

Treatment Response Monitoring-

Bacteriology

Bacteriology Date	Smear	Measure	Culture	Comments
1/10/2026	Positive	<1/field	positive	Pan susceptible
1/11/2026	Positive	<1/field	positive	
1/12/2026	Positive	<1/field	positive	
1/24/2026	Negative		positive	
1/25/2026	Negative		positive	
1/25/2026	Positive	<1/field	positive	
1/31/2026	Positive	1-10/field	positive	
1/31/2026	Positive	rare	positive	
2/1/2026	Positive	<1/field	positive	
2/10/2026	Positive	1-10/field	positive	hemoptysis
2/11/2026	Positive	>10/field	positive	Rifampin 900mg and TDM; CXR improved recheck susceptibilities
2/12/2026	Negative		positive	
2/26/2026	Negative		positive	INH to 450mg Rifampin to 1200mg Consult
2/27/2026	positive	<1/field	positive	
3/10/2026	positive	<1/field	positive	Moxifloxacin, Linezolid redraw TDM
3/11/2026	positive	<1/field	positive	
3/12/2026	Negative		positive	

Treatment Response Monitoring-

Radiology

Initial CXR – All patients

2 month Follow up CXR – if baseline is abnormal

Final CXR – if previous CXR was abnormal

PRN CXR – Interruption of treatment or concern of progression

2V CXR for <18 y/o or HIV positive

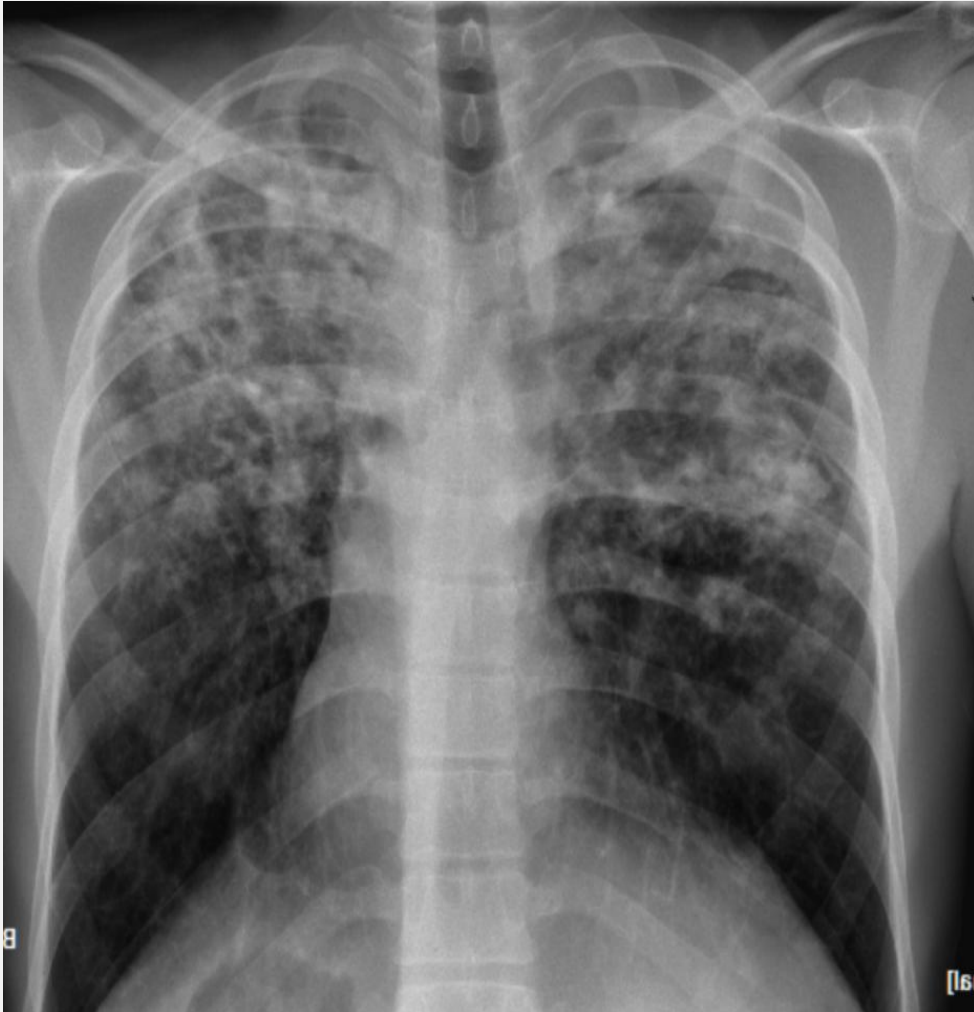
Imaging may be every month to 2 months for certain regimens or history of poor response

Pregnant patients should not delay and use abdominal shield

Other-CT and MRI on a case by case basis and determinant on site of disease (meningeal, organ)

Treatment Response Monitoring-

Radiology



Identification and Monitoring of Side Effects and Adverse Reactions



**Daily DOT and Monthly
toxicity screening**

Review of Systems

Physical Exam

Laboratory Assessments

Identification and Monitoring of Side Effects and Adverse Reactions

- *Renal Dosing for $CrCl < 30 \text{ ml/min}$
(EMB, PZA, Rfb)
- Hepatotoxicity
(INH, RIF, PZA)
- Peripheral Neuropathy
(INH, LZD, CS, FQs, Injectables)
- Gastrointestinal Upset
(INH, EMB, PZA, Eto/Pto, PAS, Bdq, Cfz, Dlm, LZD, Cs, Amx/Clv)
- Vision Changes
(EMB, LZD, Eto/Pto, Rfb, Rare w/Cfz & INH)



Nursing Plan of Care Side Effect and Adverse Reaction Monitoring

Assess patient ?diet/medications/Comorbidities

Hold medications

Collect labs as per SDO's

Document

Notify treating MD

Obtain new orders

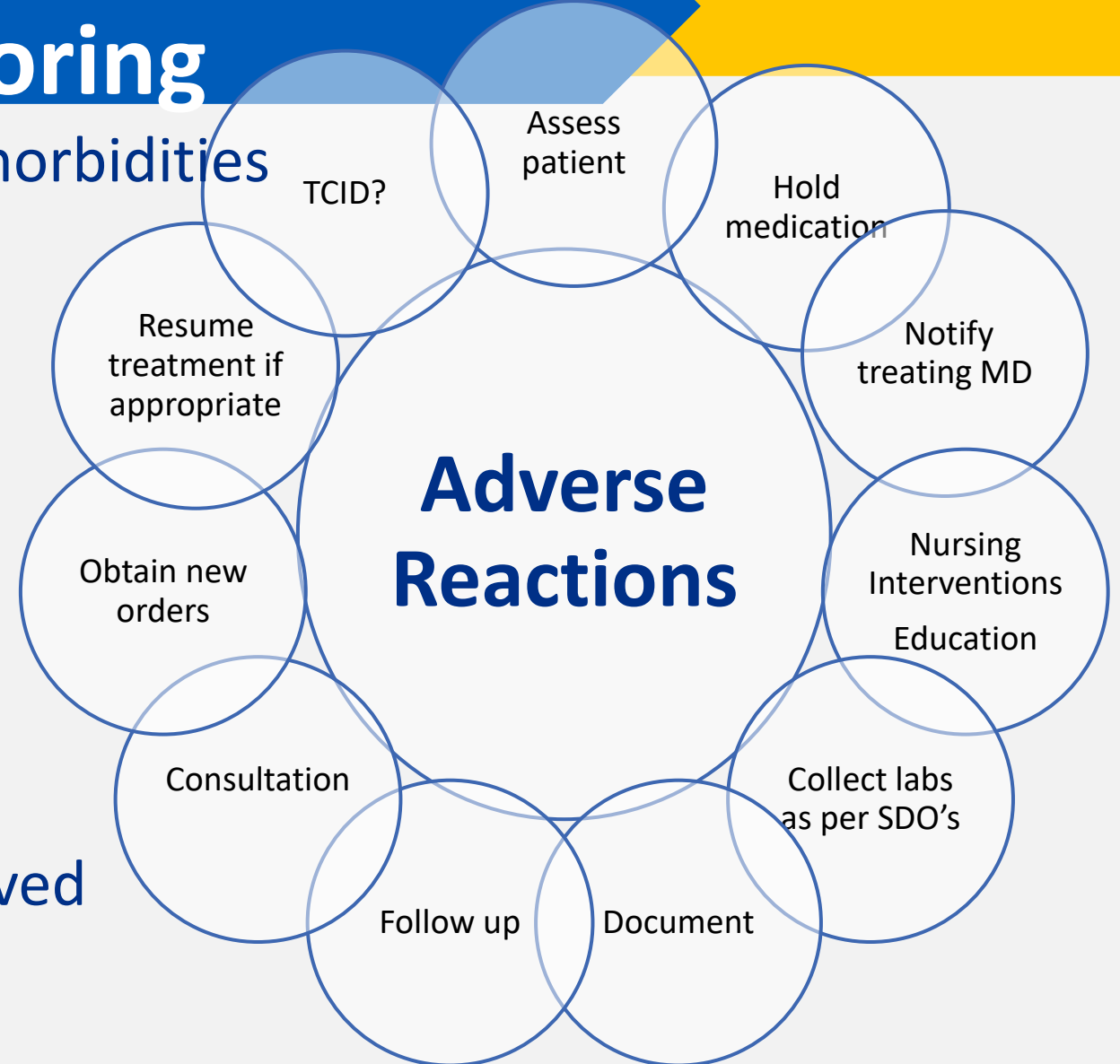
Follow up

Educate patient

Resume treatment if appropriate

Consultation with Heartland or Approved provider

Transfer TCID?



Patient and Administrative Care After Adverse Reactions

Address Patient Concerns

- Reassure patient
- Keep patient informed

Expert Consultation

- Heartland TB Consultants

Resumption of TB medications

- Drug Challenge

Document any Adverse Events

EF12-12274 Report of Serious Adverse Drug Reaction Resulting in Therapeutic Changes, Hospitalization or Death.



Treatment Response Monitoring-

Psychosocial

Assessment

- At first visit, discuss patient goals.
- Shared decision making is difficult in the Public Health Setting. Give your patient safe controls.

Interventions

- Protect from Stigma
- Do not prolong respiratory isolation
- Build rapport with patient and address holistic needs
- Social Services
- Housing and food security needs
- Incentives and Enablers for transportation
- Support Groups

Treatment Response Monitoring-

FAILURE

Averaging up all the scores

REPORT CARD

F

Treatment
Failure!

Treatment Failure

- Culture conversion >4 months of treatment.

Potential Causes

- Cheeking medications
- Vomiting after DOT
- Drug Resistance
- High disease burden of disease
- Subtherapeutic drug levels
- Drug interactions/Comorbidities
- Patient mental status

CONSULT!!!

Treatment Response Monitoring-

Success!!

Averaging up all the scores

REPORT CARD

A+

Treatment Completion

Success in

- implementing components of an effective nursing and medical treatment plan
- Assessing and evaluating anticipated clinical, laboratory, bacteriologic and radiologic response(s) to treatment
- Identifying physical and psychosocial influences for delayed response to treatment
- Intervening appropriately for delayed/unmet treatment response thresholds

Additional Considerations

AFB (+) bacteriology results may be dead or live bugs

NAAT (+) results may occur in previously treated patients

HPLC (+) results **ARE** actively growing results

MTB (+) patients may have a negative IGRA or PPD

Patients with a normal CXR may be MTB (+)

AFB (-) and culture negative patients may be clinical cases (pleural MTB, extrapulmonary)



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Therapeutic Drug Monitoring

Criteria* for Collecting Serum Drug Levels

Bacteriological Criteria (consider at 8 weeks of therapy)	Medical Criteria (consider at 2-4 weeks of therapy)	Clinical Criteria (consider at 8 weeks of therapy)	Criteria based on TB Diagnosis**
Slow response to adequate therapy at 8 weeks of treatment, evidenced by the following: • Patient remains AFB sputum smear positive 2+ or greater (unless easily explained) And/or • Sputum smear results not decreasing as expected (4+ to 3+, 2+, etc.)	• TB/poorly controlled diabetes comorbidity • Mal-absorption due to chronic or acute co-morbidity • Chronic or excessive vomiting or diarrhea • HIV infection and CD-4 count <100** • Low or high body mass index (>10% above or below ideal body weight)	• No improvement of TB symptoms (i.e., no weight gain, no reduction in cough, etc.) at 8 weeks • Worsening CXR anytime during course of adequate therapy • New clinical deterioration, likely related to TB (i.e., new evaluation for TB relapse or concern for drug resistance**)	• Patient Relapse: When signs and symptoms of TB return within two years of a prior episode of disease and there was a good possibility that relapse was due to low drug levels (exclude previous poor adherence, missed doses, or N/V) • When second line drugs need monitoring, as per consult recommendations • TB meningitis

* Therapeutic Drug Monitoring should be reserved for patients who are not responding to adequate therapy, and not necessarily for patients who meet some of the stated criteria and are otherwise doing well.

** Consultation recommended by a DSHS-recognized TB medical consultant, see list here: dshs.texas.gov/idcu/disease/tb/consultants/

Support System

Patient support groups are an integral part of TB care

SHALINI SAKSENA tells you how patient support groups have helped people suffering from TB by increasing help-seeking behaviour

Participation of individuals affected by any disease forms the center of any public healthcare response. While interventions by the government, civil society organisations, donors and others are vital, success largely depends on the individuals. Tuberculosis is a curable disease and a successful treatment is possible when there is a person-centered care approach used.

The treatment process is long-drawn, expensive, and can cause severe stress. Many also report severe treatment side-effects like loss of appetite, nausea and temporary blurring of vision. These can lead to patients stopping the treatment process. Hence, it becomes crucial to offer an empowering experience which motivates them to seek help and continue their treatment.

Even though there are plenty of free TB care services available, the cost incurred in transportation, medicines and taking a nutritious diet can cause additional problems for people. Many times, people undergoing TB treatment may not know someone who also suffers



from TB and needs additional support and understands what they are going through. This is where Patient Support Groups play an important role.

A patient support group is a non-judgmental, inclusive gathering of patients and caregivers which are held for the patient and enables mutual support through experience-sharing and discussing concerns about treatment protocols with other patients. Not only can these groups help in providing support, but they can also help in making the person understand the importance of treatment adher-

ence. These meetings allow sharing of experiences which offer hope and help one realize that "they are not alone".

Patient support groups also make people understand the importance of counselling and how important it is for a holistic treatment of TB, which accounts for physical and mental health. Therapy is an integral part of the treatment as it provides necessary support and positive coping strategies to deal with the situation by interacting with others going through the same challenges.

The National Strategic Plan

(NSP) for TB in India has included patient support in its guidelines. The guidelines specify that every patient who is on TB treatment must be given nutritional support, treatment literacy and counselling. Karnataka Health Promotion Trust (KHPT) has set out to work towards filling this gap by providing a space for the patient where they can share their experiences and reassure them that they are not alone. As the meetings were held within health-care settings, they could interact with medical experts and access correct information as well which was also a motivation for them to attend these meetings.

Patient support groups have helped numerous people suffering from TB by increasing help-seeking behaviour. These groups are an important part of TB treatment that help patients overcome unpleasant treatment experiences and stigma during the treatment period using a peer support approach. They also make sure that the treatment process is more inclusive and interactive and hence must become a beacon of hope for so many of us suffering from TB.

Private Medical Professionals

Public Health

Family

Friends

Mental Health

Food banks

Support Groups



Texas Department of State
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Conclusion



Monitoring
is the key to
successful
outcomes.



Adherence
prevents
resistance
and relapse.



Patient
centered
treatment
promotes
completion
of adequate
treatment.



Holistic
approach
improves
patient
response.

Additional References

DSHS South Texas

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Texas Department of State Health Services:

[TB Funded Programs | Texas DSHS](#)

[Texas Tuberculosis Manual](#)

[Texas Department of State Health Services Standing Delegation Orders for Tuberculosis Clinical Services Provided by Authorized Licensed Nurses, Fiscal Year 2025](#)

[TB Forms Resources | Texas DSHS](#)

[Rules and Regulations | Texas DSHS](#)

[TB Resources](#)

Heartland National TB Center:

<http://www.heartlandntbc.org/training/>

Centers for Disease Control and Prevention:

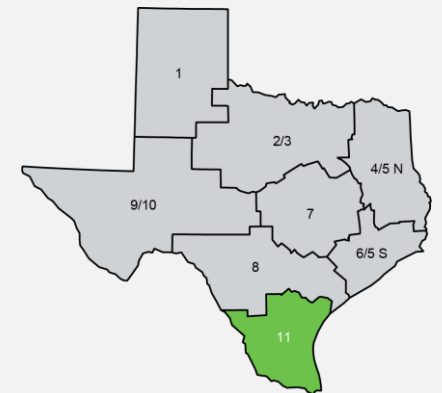
[https://www.cdc.gov/tb/media/pdfs/Self Study Module 7 Patient Rights and Confidentiality in Tuberculosis Control.pdf](https://www.cdc.gov/tb/media/pdfs/Self_Study_Module_7_Patient_Rights_and_Confidentiality_in_Tuberculosis_Control.pdf)
[Slide55.PNG \(1280×720\)](#)

Additional Resources:

https://www.drugs.com/drug_interactions.html

https://www.currytbcenter.ucsf.edu/sites/default/files/2022-12/Rifamycin_2022.pdf

<https://findahealthcenter.hrsa.gov/>



Thank You!

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