Nursing Guide for **Managing Side Effects** to Drug-resistant TB Treatment

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CURRY INTERNATIONAL TUBERCULOSIS CENTER

UCSF University of California San Francisco

Stop TB Partnership
TB REACH

This publication was made possible through a collaboration of the International Council of Nurses (ICN) TB/MDR-TB Project and the Curry International Tuberculosis Center (CITC) at the University of California, San Francisco (UCSF).

The ICN TB/MDR-TB Project is supported by a United Way Worldwide grant made possible by the generosity of the Lilly Foundation on behalf of the Lilly MDR-TB Partnership. The further development, pilot-testing, production, design, translation and dissemination of this *Nursing guide for managing side effects to drug-resistant TB treatment* is supported by the Stop TB Partnership's TB REACH initiative and is funded by the Government of Canada and the Bill & Melinda Gates Foundation.

CITC/UCSF is funded through Centers for Disease Control and Prevention (CDC) Cooperative Agreement NU52PS910163-01-00 which has supported the development, production, design and US distribution of this guide in partnership with ICN. The views expressed in written materials or publications do not necessarily reflect the official policies of the Department of Health and Human Services, nor does the mention of trade names, commercial practices, or organizations imply endorsement by the U.S. Government.

Field testing, translation (Bahasa Indonesia), printing and distribution of this guide in Tanzania and Indonesia was funded by the Global Health Bureau, Office of Infectious Disease, US Agency for International Development (USAID) through Challenge TB under the terms of Agreement No. AID-OAA-A-14-00029 and in partnership with the KNCV Tuberculosis Foundation and the American Thoracic Society. This contribution to the guide is made possible by the generous support of the American people through USAID. The contents of this guide do not necessarily reflect the views of USAID or the United States Government.

Suggested citation: International Council of Nurses and Curry International Tuberculosis Center. Nursing guide for managing side effects to drug-resistant TB treatment. Geneva. 2018.

This product is available online at the following websites:

- www.icn.ch
- www.currytbcenter.ucsf.edu/products

ISBN: 978-92-95099-53-1

Design: Edi Berton Design www.ediberton.com

Nursing guide for managing side effects to drug-resistant TB treatment

2018 Edition

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Acknowledgements

The authors of this guide wish to thank and acknowledge the contributions of those who provided incredible assistance in the development and piloting of the guide. The first iteration was field tested in 11 countries by more than 200 nurses who used the guide and provided us with invaluable feedback. We would like to thank the following individuals and organizations for their assistance in coordinating the field tests: Russian Nurses Association (Ms Natalia Serebrennikova and Ms Tatiana Fedotkina), China Nursing Association and Peking Union Medical College School of Nursing (Dr Zhao Hong and Dr Guo Aimin), Indonesia (Dr Astuti Nursasi and Challenge TB KNCV Indonesia), South Africa (Ms Sharon Fynn), Ghana National TB Control Programme (Dr Nii Nortey Hanson-Nortey), Zambia (Mr Jojo Mulenga Moyo), Thailand National TB Program (Dr Sirinapha Jittimanee), Uganda (Ms Namuyodi Damalie Waiswa), US-Mexico TB Binational Projects (Ms Catalina Navarro) and USA (Ms Lisa True).

The guide was translated into five languages for use in the pilot. We would like to acknowledge Ms Elena Ploetz and the Russian Nurses Association's TB Nurse Network for translation of the guide into Russian, Dr Zhao Hong and Dr Guo Aimin of the Peking Union Medical College School of Nursing for translation of the guide into Chinese, Ms Catalina Navarro of the Heartland National Tuberculosis Center for translation of the guide into Spanish, Ms Baby Djojonegoro of the American Thoracic Society and the Indonesian DR-TB Nurses Workgroup for translation of the guide into Bahasa Indonesia, and Dr Sirinapha Jittimanee with the Thailand National TB Program for translation of the guide into Thai.

Last, but not least, we wish to provide thanks to the more than 200 frontline nurses caring for DR-TB patients who used the guide and provided us with very thoughtful feedback. We created this guide for you and for all nurses providing care and treatment to DR-TB patients around the world. **Thank you for all you do to improve the care of patients.**

Table of Contents

Abbreviations

ABC	Abacavir
Am	Amikacin
Amx/Clv	Amoxicillin/Clavulanate
ARVs	Antiretrovirals
AZT	Zidovudine
Bdq	Bedaquiline
BMI	Body mass index
BUN	Blood urea nitrogen
Cm	Capreomycin
Cfz	Clofazimine
CMV	Cytomegalovirus
CNS	Central Nervous System
CBC	Complete blood count
CPT	Cotrimoxazole preventive therapy
Cs	Cycloserine
d4T	Stavudine
ddI	Didanosine
Dlm	Delamanid
DR-TB	Drug-resistant tuberculosis
ECG	Electrocardiogram
EFV	Efavirenz
Emb	Ethambutol
Eto/Pto	Ethionamide/ Prothionamide
FQ	Fluoroquinolone
Gfx	Gatifloxacin
GI	Gastrointestinal
Hgb	Hemoglobin
HgbA1C	Blood test used to diagnose diabetes and how well one's diabetes is controlled; this test provides the 8 – 12 week average blood glucose.
Imp/Cln	Imipenem/cilastatin
Inh	Isoniazid
INSTIs	Integrase strand transfer inhibitors
IV	Intravenous
Km	Kanamycin
LFT	Liver function test
Lfx	Levofloxacin
Lzd	Linezolid
Mfx	Moxifloxacin
Mpm	Meropenem
NFV	Nelfinavir
NRTIs	Nucleoside reverse transcriptase inhibitors
NSAIDs	Non-steroidal anti-inflammatory drugs
NVP	Nevirapine
PAS	Para-aminosalicylic acid
PIs	Protease inhibitors
PQRST	Pain assessment method (Precipitating, Quality, Region/radiation, Severity, Temporal/timing)
Pza	Pyrazinamide
Rif	Rifampin
Rfb	Rifabutin
RPV	Rilpivirine
RTV	Ritonavir
S	Streptomycin
SQV and SQV/r	Saquinavir and sequinavir/ritonavir
TDF	Tenofovir
TPV and TPV/r	Tipranavir and tipranavir/ritonavir
TMP/SMX	Trimethoprim/ sulfamethoxazole (Bactrim)
Trd	Terizidone
TSH	Thyroid-stimulating hormone

Introduction

Patients on treatment for drug-resistant tuberculosis (DR-TB) face many challenges, most notably difficult side effects such as nausea, hearing loss and fatigue that may impact the patient's quality of life, capacity to work and ability to continue activities of daily living. Recent studies have identified medication side effects as a major factor for patients stopping treatment prematurely. The 2017 WHO *Global TB Report* noted a continued crisis related to treatment outcomes for drug-resistant TB with only 54% of patients successfully completing treatment in 2014.

Nurses are frequently the first point of contact a patient will have when seeking health care and are the main cadre of health professionals worldwide delivering and/or overseeing a patient's daily directly observed treatment.

Nurses are often the first to hear of a patient's side effect(s) during TB treatment and therefore, are well positioned to intervene. In response to requests from nurses for additional nursing practice resource tools, this guide was developed to help nurses assess for and respond appropriately to side effects related to anti-TB medications. The guide is designed as a reference so nurses can quickly:

1. **Identify symptoms that may indicate an anti-TB or anti-retroviral medication-related side effect;**
2. **Assess for severity as well as other potential contributors; and**
3. **Intervene appropriately to minimize patient discomfort, reduce side effect progression, and ultimately support successful treatment completion**.

This guide was developed by nurses with experience in the clinical care and programmatic management of TB and DR-TB in both high- and low-resource settings. Nursing and DR-TB literature were reviewed to establish best practice nursing assessment and intervention guidance. Nurses caring for patients with DR-TB field tested the job aid and provided feedback which was used to inform final content and format.

How Information is Organized

The guide is organized into the major types of toxicities, the associated symptoms, possible offending medications, and the suggested nursing assessments and interventions. Some symptoms (e.g. nausea) may be associated with a number of underlying causes and may be mild, or a symptom of a more serious medical situation requiring urgent attention. The pathophysiology for medication-related fatigue and hypersalivation are unclear and these symptoms are not grouped under a specific type of toxicity. Additional information (comments) are provided for each toxicity to highlight relevant clinical information that may assist in management of side effects. Medications more strongly associated with the side effect appear in bold text. The appendices include tools nurses can use to more thoroughly assess patient complaints of pain, depression and neuropathy.

How to Use the Guide

The guide is a practical resource for nurses in inpatient, clinic and community settings and may be used in conjunction with local protocols. Some assessments and interventions may not be available or within the scope of practice in all settings; nurses should refer to local protocols when available to guide decision-making. The scope of this guide is limited to address management of medication-related side effects and does not address management of symptoms due to the disease itself or other important aspects of nursing care (such as addressing barriers to adherence). Additionally, the guide does not replace the need for training and mentoring for nurses caring for patients with DR-TB.

We encourage our nurse colleagues to continue to identify gaps in resource and training materials so that we can work to address the needs. Please contact the authors if you have questions.

Notes

Gastrointestinal

Nausea and Vomiting

Gastritis

Diarrhea

Gastrointestinal / Nausea & Vomiting

Symptoms

Nausea and/or vomiting

Possible Offending Medications

Anti-TB:	ARVs:
Eto/Pto	**RTV**
PAS	**d4T**
Bdq	NVP
Inh	and most others
Emb	
Pza	
Amx/Clv	
Cfz	
Dlm	
Lzd	
Cs/Trd	

Nursing Assessment

Observe for signs of:

- Hepatitis (fatigue, abdominal pain, yellowing of eyes and skin)
- GI bleeding (vomit with red blood or "coffee ground" appearance, abdominal pain, dizziness)
- Dehydration (dry/tenting of skin, sunken eyes, decreased urination, confusion)

Ask the patient:

- What medicines are you taking?
- When does the nausea or vomiting start?
- How often do you experience the nausea and/or vomiting and how long does it last?
- What makes it better or worse?
- How is your appetite?
- What have you had to eat/drink today?
- If vomiting, describe color and consistency

If significant vomiting, check:

- Vital signs, serum electrolytes and creatinine
- If febrile, refer for medical evaluation

Nursing Interventions

Seek urgent medical evaluation when signs of hepatitis, GI bleeding or dehydration are observed.

Counsel the patient:

- Some nausea and vomiting is expected early in DR-TB treatment but will decrease over time
- Nutrition support strategies (e.g., good hydration; small, frequent meals; ginger drinks or sweets may help)
- Relaxation techniques or other comfort measures

When nausea and/or vomiting is considered troublesome to the patient, discuss with the doctor:

- **Anti-emetic*** 30 min. before DR-TB medication
- Slow ramping up of suspect medication (Eto/Pto, PAS)
- Timing of suspect medication dose (larger dose at bedtime or different time of day)
- Anti-anxiety medication for anticipatory nausea
- Whether oral or IV rehydration needed if patient shows signs of dehydration
- Whether electrolyte replacement is indicated

Comments

Nausea and/or vomiting may also occur with:

- Acute viral illness
- Hepatitis
- Gastritis or peptic ulcer
- Pancreatitis
- Disease of the gall bladder
- Disease of the bile ducts
- Lactose intolerance
- Acute renal failure
- Alcohol withdrawal
- Diabetic gastroparesis
- Pregnancy
- Bowel obstruction
- CNS TB
- Psychological factors (e.g., anxiety)

Patients with diabetes may have better results with promotility medication (e.g., metroclopramide).

Note:

*If patient is taking Bdq or Dlm, do not give ondanestron as an anti-emetic as it may prolong QTc.

Gastrointestinal / Gastritis

Symptoms

One or more of the following symptoms:

Pain or burning sensation in abdomen or esophagus

Sour taste in mouth

Bloating

Possible Offending Medications

Anti-TB:	ARVs:
PAS	**Most ARVs**
Eto/Pto	
Cfz	
FQs (Lfx, Mfx)	
Inh	
Emb	
Pza	

Nursing Assessment

Observe for signs of:

- Hepatitis (fatigue, abdominal pain, yellowing of eyes and skin)
- GI bleeding (blood in vomit or stool)

Ask the patient:

- What medicines are you taking?
- When do the symptoms occur?
- How long does it last?
- What makes it better or worse?
- How is your appetite?
- What have you had to eat/drink today?

Check for symptoms of gastritis (epigastric burning, sour taste in mouth, abdominal distention or bloating)

Nursing Interventions

Seek urgent medical evaluation when signs of hepatitis or GI bleeding (presence of blood in vomit or stool) are observed.

Counsel the patient:

- Gastritis is a common side effect of DR-TB treatment and can be treated
- Try eating small, frequent meals. Avoid food and drink that may make symptoms worse (e.g., alcohol, caffeine, spicy, acidic, high fat)
- Try relaxation and/or distraction techniques

When gastritis is troublesome, discuss with the doctor:

- Whether use of adjuvant medication (H2-blocker or proton-pump inhibitor) may help
- Minimize or discontinue use of NSAIDs
- Starting an antacid; NOTE: antacids must be taken 2 hours before or after TB medications

Comments

Symptoms are often worse in the morning or prior to eating. Patients who take nonsteroidal anti-inflammatory drugs (NSAIDs) or drink a lot of alcohol are at increased risk.

Abdominal pain is a common side effect of ARVs.

Abdominal pain can also occur with pancreatitis, lactic acidosis, infection with H. pylori and peptic ulcer.

Cfz has been associated with severe abdominal distress. In such cases, Cfz should be stopped. If patient is taking the short DR-TB regimen which includes Cfz and must stop due to this adverse effect, the patient no longer qualifies to complete the shorter regimen and must switch to an alternative DR-TB regimen.

Gastrointestinal / Diarrhea

Symptoms

Frequent and/or loose stool

May be accompanied by:

Abdominal cramping

Possible Offending Medications

Anti-TB:	ARVs:
PAS	**All PIs**
Eto/Pto	**ddI** (buffered formulation)
FQs (Lfx, Mfx)	
Lzd	
Amx/Clv	

Nursing Assessment

Observe for signs of:

- Dehydration (dry/tenting of skin, sunken eyes, decreased urination, confusion, fatigue and extreme weakness)

Ask the patient:

- When did this start?
- How many times a day are you passing stool?
- What makes it better or worse?
- What does the stool look like?
- Is there blood or mucous in the stool? **If yes,** refer immediately for medical evaluation

Check:

- Vital signs — if febrile, refer for medical evaluation

Nursing Interventions

Seek urgent medical evaluation when signs of dehydration are observed.

Counsel the patient:

- Loose stools are common early in DR-TB treatment but usually resolve after a few weeks
- Drink plenty of fluids throughout the day
- Avoid high fiber or fatty/fried foods
- Probiotic products (with Lactobacillus) or foods such as yogurt (**not given within 2 hours of the FQ**) may improve symptoms by replacing normal flora/gut bacteria

When diarrhea is considered troublesome to the patient, discuss with the doctor:

- Use of adjuvant medication (loperamide)
- Slow ramping up of the suspect medication (PAS)
- Dose reduction of suspect medication if it would not compromise the regimen

Comments

Diarrhea related to PAS usually improves after a few weeks on DR-TB treatment.

Diarrhea related to Lzd use may resolve with a dose reduction.

The presence of fever or blood in the stool suggests diarrhea may be due to a cause other than the anti-TB medications or ARVs.

Diarrhea may also occur with:

- Inflammatory bowel disease
- Waterborne bacterial and parasitic infections
- Clostridium difficile (pseudomembranous colitis)
- Lactose intolerance

Notes

Hepatoxicity

Hepatoxicity

Symptoms

Nausea, vomiting

+ PLUS

Abdominal pain, fatigue, and loss of appetite.

Later stage symptoms may include:

Fever

Rash

Jaundice
(yellowing of the eyes and skin)

Possible Offending Medications

Anti-TB:	ARVs:
Inh	**NVP**
Pza	**EFV**
Rif	**PIs** (**TPV/r**> others)
Rfb	most NRTIs (d4T, ddI, AZT)
Eto/Pto	
Bdq	
PAS	
Rarely, Emb and Mfx	

Nursing Assessment

Same observations and questions for assessing nausea and vomiting PLUS:

- **Observe for signs of** jaundice (yellowing of the skin and whites of the eyes)
- Use PQRST pain assessment approach when patient reports pain (see Appendix A)

Ask the patient:

- Do you drink alcohol?
  If yes, how much, how often and when was your last drink?

Check:

- Latest liver function test (LFT), total bilirubin, serum albumin and electrolytes
- Viral hepatitis panel results
- Urine and stool color
- Patient's nutritional status (weight and BMI) and nutritional intake

Nursing Interventions

Seek urgent medical evaluation when these symptoms are present together and/or if liver enzymes are greater than or equal to 5 times the upper limit of normal.

- Stop all anti-TB medications and other hepatotoxic medications
- Evaluate and treat other potential causes

Counsel the patient:

- Comfort measures to minimize pain
- Limited activity to conserve energy
- Frequent small meals to maintain optimal energy metabolism
- Avoid alcohol

Discuss with the doctor:

- Whether oral or IV rehydration needed if patient shows signs of dehydration
- Nutrition consult if available
- Whether blood tests should be done/repeated (LFT, T. bilirubin, albumin, viral serology)
- Plans for re-introduction of TB medications and whether to discontinue likely offending medications

Comments

Abdominal pain may be an early symptom of severe side effects, such as pancreatitis, hepatitis or lactic acidosis.

HIV coinfection may increase risk of hepatitis.

Other medications may also contribute (e.g., TPM/SMX, ibuprofen, acetaminophen).

Viral causes of hepatitis (hepatitis A, B, C, and cytomegalovirus) should be evaluated.

EFV, NVP and TPV/r **are not recommended** in patients with HIV and hepatic insufficiency.

Notes

Musculoskeletal

Musculoskeletal

Symptoms

Muscle pain or joint pain

Possible Offending Medications

Anti-TB:	ARVs:
Pza	**Indinavir**
FQs (Lfx, Mfx)	other PIs
Eto/Pto	
Bdq	
Rfb	

Nursing Assessment

Observe for signs of acute swelling, erythema and warmth at the site of muscle or joint pain.

Ask the patient:

- What medicines are you taking for the muscle or joint pain?
- Any past medical history of joint or muscle pain?
- Use pain assessment questions in Appendix A

Check:

- TSH, serum electrolytes and uric acid blood tests

Nursing Interventions

Seek further medical evaluation if:

- Acute swelling, erythema, and warmth are present to evaluate for infection or inflammatory disease
- TSH, electrolytes or uric acid blood tests are abnormal

Counsel the patient:

- Some pain/tenderness of muscles and joints is common during first weeks of treatment but will decrease over time
- Avoid vigorous physical activity if there is Achilles' tendon tenderness
- Physical activity as tolerated may help decrease the pain
- Low-purine diet may help if pain is due to gout (e.g. avoid meats high in purine such as liver and kidney; limit intake of red meat, poultry and fish)
- Importance of keeping well-hydrated

When a patient experiences or is troubled by muscle or joint pain, discuss with the doctor:

- Use of ancillary analgesic /NSAIDs

Comments

Protease inhibitors can cause joint pain and rarely, more severe rheumatologic pathology.

Tendon rupture associated with FQ use is rare; older patients and those with diabetes may have greater risk.

Electrolyte disturbances associated with the aminoglycosides and Cm may also cause muscle pain and cramping.

Hypothyroidism may also contribute.

Pza may need to be stopped in order to relieve acute gout related to this medication.

Notes

Fatigue

Fatigue

Symptoms

General feeling of tiredness

Lack of energy

Possible Offending Medications

Anti-TB:

Any drug

Nursing Assessment

Observe for signs of fatigue such as decreased ability to perform usual activities and functions of daily living.

Ask the patient:

- When did you begin to notice a change in your energy?
- What is the pattern and duration of your fatigue during the day?
- What makes it better or worse?
- What have you had to eat and drink today?
- What is your sleep pattern?
- Do you feel you are getting enough sleep?

Check:

- Underlying causes of fatigue including anemia, sleep disturbance, nutritional or electrolyte imbalances, hypothyroidism and lactic acidosis

Nursing Interventions

Seek further medical evaluation if there is evidence of specific contributing factors including pain, emotional distress, anemia, electrolyte imbalance or hypothyroidism.

Counsel the patient:

- Self-monitor fatigue levels and use strategies for energy conservation
- Consider exercising as tolerated
- Maintain good nutritional diet
- Importance of adequate sleep

Discuss with doctor:

- Treatment for underlying causes
- Whether medications can be given later in the day or evening to minimize impact of fatigue

Comments

Fatigue can be a distressing and disruptive symptom that may be under-reported and under-treated.

Fatigue is rarely an isolated symptom and most commonly occurs with other symptoms such as pain, emotional distress, nausea, and sleep disturbance.

Fatigue may be related to TB disease itself, medication side effects or other co-morbidities.

Notes

Neurological

- Optic Neuritis
- Ototoxicity and Vestibular Toxicity
- Peripheral Neuropathy
- Depression
- Psychosis
- Headache
- Seizure

Neurological / Optic Neuritis

Symptoms

Vision changes
(color and acuity)

Pain around the eye or with eye movement

Possible Offending Medications

Anti-TB:	**ARVs:**
Emb	ddI
Lzd	
Eto/Pto	
Rfb	
Cfz and Inh (rare)	

Nursing Assessment

Observe for signs of acute vision changes.

Ask the patient:

- Any changes or problems with your eye sight?
  If so, describe the changes you've noticed.
- Are you having any eye pain?

Check:

- Visual acuity and color vision
- Serum glucose and HgbA1c
- Creatinine clearance

Nursing Interventions

Seek medical evaluation for acute vision changes or eye pain.

Counsel the patient (and family):

- To watch for and report any vision changes or eye pain
- Importance of ensuring safe environment for patient with visual impairment
- Avoid vigorous exercise until condition is evaluated
- Importance of keeping blood glucose in a healthy range if patient also has diabetes

Discuss with the doctor:

- Whether referral for ophthalmologist evaluation may be indicated
- Whether suspected offending medication should be discontinued and replaced
- Frequency of Emb dosing from daily to thrice weekly when creatinine clearance is < 30 mL/min.

Comments

Retinopathy may occur with the use of Cfz requiring discontinuation of Cfz.

Optic neuropathy may occur in patients taking Lzd, sometimes presenting after month 4 or more of treatment. This condition is usually reversible upon stopping the medication. Some have used lower dose of 300 mg daily or 600 mg every other day without recurrence when other medication options were limited.

In patients with diabetes, work towards improving glucose control.

Note:

Baseline + monthly monitoring of visual acuity and color vision is indicated when patient is taking daily Emb or Lzd.

Neurological / Vestibular/Ototoxicity

Symptoms

Some combination of the following symptoms:

Hearing loss

Tinnitus
(ringing in the ears)

Dizziness

Loss of balance

Abnormal gait

Possible Offending Medications

Anti-TB:	ARVs:
Am	TDF (Rare)
Km	
S	
Cm	

Nursing Assessment

Observe for signs of:

- Loss of balance or abnormal gait (e.g., weaving or staggering)
- Hearing loss

Ask the patient:

- How is your hearing?
- Any ringing or fullness in your ears? **If yes,** one side or both sides?
- Are you feeling dizzy, weak or unsteady?

Check at baseline and monthly:

- Hearing with audiogram (if available)
- Balance (standing and walking)

Nursing Interventions

Seek medical evaluation when signs of hearing loss or change in balance are observed.

Counsel the patient:

- Importance of hearing tests to assess for early signs of hearing loss (usually high frequency loss occurs first)
- Report any changes in hearing or balance
- Avoid sudden position changes or activities that result in worsening symptoms

When a patient experiences or is troubled by worsening hearing loss, poor balance, tinnitus or dizziness, discuss with the doctor:

- Frequency of injectable (able to decrease to twice or thrice weekly?)
- Whether to discontinue the injectable

Comments

High frequency hearing loss usually occurs first and requires sensitive audiogram equipment to detect. Loss of hearing at conversational speech frequencies occurs as hearing loss progresses. Hearing loss may continue even after injectable is stopped.

Other causes of mild dizziness may include Cs, Trd, FQs, Eto/ Pto, Inh or Lzd. Stopping all anti-TB medications for several days can help to distinguish the cause.

Concomitant use of furosemide may worsen ototoxic effects (particularly with renal insufficiency).

Note:

Hearing loss and vestibular dysfunction are generally not reversible on stopping therapy. Check and document hearing and vestibular function at baseline and monthly when Am, Km, Cm or S given.

Neurological / Peripheral Neuropathy

Symptoms

Tingling

Prickling

Burning or numbness sensation in toes, balls of feet, fingers or hands

As symptoms progress:

Weakness and gait instability may result

Possible Offending Medications

Anti-TB:	ARVs:
Lzd	**d4T**
Inh	**ddI**
Cs/Trd	
S	
Am	
Km	
Cm	
FQs (Lfx, Mfx)	
Rarely: Eto/Pto	
Emb	

Nursing Assessment

Observe for signs of neuropathy (change in sensation in lower extremities).

Ask the patient:

- When did you first notice these symptoms?
- Did you have these symptoms before starting DR-TB treatment or did it start after?
- Do you smoke or drink alcohol?
- Have you been tested for or do you have diabetes? HIV? Hypothyroidism?
- *[If patient is female]* When was your last menstrual period?

Check:

- HgbA1c
- TSH
- Pregnancy test if female of child-bearing age
- Physical exam: assess sensation in the feet and hands and reflexes (see Appendix C)

Nursing Interventions

Seek further medical evaluation when a patient reports these symptoms or when findings from peripheral neuropathy screening (see Appendix C) indicated the presence or worsening of symptoms associated with peripheral neuropathy.

Counsel the patient:

- Importance of good nutrition
- Strategies for blood sugar control if diabetic
- Avoiding alcohol (detox/rehab if indicated) and smoking which can make neuropathy worse
- Importance of reporting any numbness, tingling or pain in hands or feet

When a patient shows signs of peripheral neuropathy, discuss with the doctor:

- Vitamin or nutritional supplement needed?
- Whether likely offending medication should be discontinued or dose decreased
- Whether thyroid replacement is needed
- Other medical interventions that may help (e.g., gabapentine or a tri-cyclic antidepressant)

Comments

Neuropathy is more likely to occur in patients with HIV, diabetes, alcoholism, hypothyroidism, poor nutrition and/or pregnancy.

Use of d4T or ddI in combination with Cs, Trd or Lzd increases risk of peripheral neuropathy.

Patients taking Inh, Lzd, Cs or Trd should receive supplemental pyridoxine (vitamin B6).

Pyridoxine-related neuropathy has been reported when dose > 100 mg taken daily.

Appendix C is an assessment instrument nurses can use to identify and monitor peripheral neuropathy at baseline and throughout DR-TB treatment. When peripheral neuropathy is identified, findings should be reported to the treating physician and the patient further evaluated.

Neurological / Depression

Symptoms

Some combination of the following symptoms:

- Mood changes
- Agitation
- Irritability
- Difficulty coping with challenges
- Difficulty concentrating
- Feelings of hopelessness
- Sleep disturbances (e.g., insomnia)
- Suicidal thoughts

Possible Offending Medications

Anti-TB:	**ARVs:**
Cs/Trd	**EFV**
FQs (Lfx, Mfx)	RPV
Inh	all INSTIs
Eto/Pto	

Nursing Assessment

Observe for and refer immediately if the patient shows **signs of acute depression or reports thinking of hurting him/herself.**

Ask the patient (and family):

- When did you first notice these symptoms?
- What are you currently doing to manage your symptoms or situation?
- Do you drink alcohol, or are you taking other medications, herbs, or traditional medicine?
- Have you had thoughts of hurting yourself or that you would be better off dead?
- Are you experiencing any other psychosocial stressors?

Check for signs of depression:

- Where available, use a depression screening tool (baseline and monthly if patient is taking Cs or Trd) (see Appendix B for sample tool)
- If patient states wanting to end his/her life, ask directly if he/she has a plan or a history of suicide attempt
- Assess seriousness of plan and need for immediate supervision

→ **Note**—*asking a patient about suicidal intent is unlikely to trigger an attempt. Generally the patient is relieved to talk about it.*

Check:

- TSH
- Cs serum drug concentration where available

Nursing Interventions

Seek urgent medical evaluation when **signs of acute depression or suicidal ideation** are present. Ensure safety of the situation: patient may not be left alone if intent on suicide.

Suicide warning signs:

Patient talks about being a burden to others, about feeling hopeless or having no reason to live

Counsel the patient (and family):

- Warn of possible side effect on mood, to watch for and report to the nurse or doctor any changes in mood, behavior or **signs the patient may be thinking of suicide**.
- Avoid drinking alcohol while on MDR-TB treatment (detox/rehab if indicated)
- Importance of family/community support
- Relaxation techniques may help
- Reassure that depression is not permanent

When a patient shows signs of depression, discuss with the doctor:

- How to address other psychosocial stressors or substance abuse if present
- Whether antidepressant therapy is needed
- Whether thyroid replacement is needed
- Whether dose of Cs, Trd or Eto can be decreased or discontinued
- Psychiatric evaluation and/or counseling

Comments

Patients taking Cs, Trd or EFV may experience severe depression and should therefore be monitored for depression at baseline and monthly.

Situational depression may occur following challenges encountered accompanying DR-TB and treatment.

FQs may cause insomnia in some patients.

Some patients taking Cfz with resulting skin color changes may experience reactive depression.

Patients with untreated hypothyroidism may experience depression.

In patients taking Lzd, use of tricyclic antidepressants and selective serotonin reuptake inhibitors should be avoided due to risk of serotonin syndrome.

PHQ-9 depression screening tool (Appendix B) is translated in multiple languages and is available at: http://www.multiculturalmentalhealth.ca/clinical-tools/assessment/

Neurological / Psychosis

Symptoms

Some combination of the following symptoms:

- Nightmares
- Insomnia
- Agitation
- Delusions
- Hallucinations
- Severe mood swings
- Psychotic behavior or thoughts

Possible Offending Medications

Anti-TB:	**ARVs:**
Cs/Trd	**EFV**
FQs (Lfx, Mfx)	
Inh	
Eto/Pto	

Nursing Assessment

Observe for signs of psychosis.

Ask the patient (and family):

- How well are you sleeping? Any insomnia?
- Have you noticed any changes in behavior? If so, describe.
- Do you drink alcohol?
  If yes, describe typical use
- What other prescription or non-prescription medications are you taking and how often?
- Do you hear any voices or see things other people cannot see?

  If yes:
  - What are you seeing?
  - What are the voices saying?

Check:

- Evidence of impulsive behavior?
- Any behaviors that suggests that the patient is hallucinating?
- Serum creatinine and TSH
- Cs serum drug concentration where available

Nursing Interventions

Seek urgent medical evaluation when a patient shows signs of psychosis.

- Hold suspected drug until psychotic symptoms are brought under control (most likely Cs or Trd if patient taking this medication)
- If hallucinations or delusions present, ensure safety; do not challenge delusion but reassure and orient patient to reality

Counsel the patient (and family):

- To watch for and report any changes in mood or behavior
- Grounding techniques such as counting steps while walking, identifying objects or colors in the room may help
- Reassure that psychotic perceptions are reversible should they occur as a result of TB treatment

Discuss with the doctor:

- Psychiatric evaluation and hospitalization if not already hospitalized
- Anti-psychotic therapy
- Whether thyroid replacement is needed
- Whether pyridoxine (B6) dose is adequate

Comments

EFV has a high rate of CNS side effects; usually occurring in first 2-3 weeks of use then resolves. If persistent, consider substitution of the agent.

Patients with decreased renal function may have elevated serum drug concentrations of Cs.

There are limited data on the use of EFV with Cs; concurrent use is the accepted practice as long as there is frequent monitoring for CNS toxicity.

TMP/SMX has also been reported to be associated with psychosis.

Sometimes patients experience insomnia without other signs of psychosis. In such cases, changing timing of the likely offending medication (FQ's) to the morning may help.

Neurological / Headache

Symptoms

Headache

Possible Offending Medications

Anti-TB:	ARVs:
Cs/Trd	**AZT**
Bdq	**EFV**
Inh	

Nursing Assessment

Observe for signs of severe or persistent headache.

Ask the patient:

- When did the headaches start?
- When do you usually notice the headache?
- What activity are you doing prior to the onset of the headaches?
- How long do the headaches last on average?
- What makes it better or worse?

Check:

- Vital signs (temperature, pulse, respirations and blood pressure)
- Further pain assessment. Use pain assessment tool found in Appendix A

Nursing Interventions

Seek further medical evaluation if the patient reports severe or persistent headache.

Counsel the patient:

- Mild headaches are common in the first few months of treatment but should decrease over time
- Importance of keeping well hydrated
- Use of relaxation techniques
- Avoid activities that make headache worse
- Encourage use of distraction techniques

When headache is considered troublesome to the patient, discuss with the doctor:

- Use of analgesic as needed
- Addition of pyridoxine if patient taking Cs or Trd
- Whether medication for high blood pressure is needed

Comments

To minimize headaches at the start of treatment, Cs is often started at lower dose and gradually increased to target daily dose over 1-2 weeks and B6 provided (50mg B6 for every 250mg Cs prescribed).

Headaches secondary to AZT, EFV, Cs and Bdq are usually self-limited.

Note:

When persistent or severe, rule out more serious causes of headache, such as bacterial meningitis, cryptococcal meningitis, CNS toxoplasmosis, CNS TB, etc.

Neurological / Seizure

Symptoms

- Tonic-clonic movements
- Convulsions
- Altered mental status

Possible Offending Medications

Anti-TB:

Cs/Trd

Inh

FQs

Nursing Assessment

Observe for signs of seizure.

Ask the patient (family):

- When did the seizure(s) start?
- What were the specific symptoms and if any preceding aura?
- How long did the seizure last?
- Did you lose consciousness?

Check:

- Serum electrolytes including potassium, sodium, bicarbonate, calcium, magnesium and chloride
- Creatinine

Nursing Interventions

Seek urgent medical evaluation when a patient shows signs of a seizure.

- Hold Cs/Trd, Inh, and FQs pending resolution of seizures
- Evaluate possible cause of seizure

Counsel the patient (and family):

- To watch for and report any signs of seizure

Discuss with the doctor:

- Whether to increase B6 dose to maximum dose of 200 mg daily
- Whether replacement of serum electrolytes is needed
- If poor renal function, there could be a high blood level of Cs and adjusting the Cs or Trd dose may result in controlling the seizure.

Comments

Patients with prior seizure history may be at increased risk for seizure development during DR-TB treatment. If possible, avoid Cs/Trd use in these patients.

Possible cause of seizure may include:

- TB medications (particularly Inh overdose which can be life threatening)
- infection
- hypoglycemia
- electrolyte abnormalities
- hypoxia
- alcohol withdrawal
- other drugs
- uremia
- decreased renal function
- hepatic failure

Anticonvulsants are generally continued until DR-TB treatment is completed or until the suspected drug is discontinued.

Notes

Hematological

Anemia

Thrombocytopenia

Hematological /Anemia

Symptoms

- Fatigue
- Shortness of breath
- Developing or worsening pallor

Possible Offending Medications

Anti-TB:	ARVs:
Lzd	AZT
Rif	
Rfb	
Inh	

Nursing Assessment

Observe for fatigue, shortness of breath with exertion, hemoptysis, changes in pallor including pale conjunctiva.

Ask the patient:

- Have you noticed any bleeding? (blood in stool or urine, abdominal pain or swelling, heavy menstruation)
- When did you begin to experience symptoms?
- Have you ever received a blood transfusion?
- What type of food do you have available to eat?

Check:

- Signs of external or internal bleeding (blood in stool, abdominal pain and swelling)
- Hgb/Hct
- Mean corpuscular volume

Nursing Interventions

Seek urgent medical evaluation if Hgb is less than 8 gm/dL or if severe bleeding occurring

Counsel the patient:

- Adequate nutritional intake and include iron rich foods if patient has iron deficient anemia
- Report any bleeding (black stools, blood in urine, heavy menstrual period)

Discuss with the doctor:

- Assessment for specific type of anemia and cause
- Whether stopping the Lzd or lowering dose from 600 mg to 300 mg may be indicated
- Whether erythropoietin or blood transfusion needed if anemia is severe
- Use of supplements depending on type of anemia
- Whether stool analysis for ova and parasites should be done

Comments

Persons with DR-TB often have multiple comorbidities and reasons to develop anemia including chronic disease, iron deficiency and opportunistic infections. Anemia treatment approach depends on specific type of blood cell disorder.

The use of AZT and Lzd should be avoided in persons with Hgb less than 8gm/dL.

Note:

Do not give iron supplements within 2 hours of FQs.

Hematological / Thrombocytopenia

Symptoms

Easy bruising

Nose bleeds

Possible Offending Medications

Anti-TB:

Rif

Rfb

Lzd

Eto/Pto (rare)

Nursing Assessment

Observe for bruises, nose bleeds, bleeding gums, petechiae.

Ask the patient:

- Have you noticed any bleeding? (blood in stool or urine, abdominal pain or swelling, or heavy menstruation)
- When did you begin to experience these symptoms?

Check:

- Platelet count

Nursing Interventions

Seek urgent medical evaluation if platelet count is less than 25,000 mm3 or if severe bleeding occurring.

Counsel the patient:

- Report any new bruises or bleeding (black stools, blood in urine, heavy menstrual period)

Discuss with the doctor:

- Assessment for causes of thrombocytopenia
- Whether Lzd should be stopped
- Whether a platelet transfusion is needed

Comments

Persons with DR-TB often have multiple comorbidities, including HIV and opportunistic infections that could cause low platelets.

Notes

Renal Toxicity

Acute Renal Failure

Electrolyte Disturbances

Renal Toxicity /Acute Renal Failure

Symptoms

May be asymptomatic early on

Later stage symptoms may include:

Decreased production of urine

Lower limb edema

Mental status changes

Shortness of breath

Possible Offending Medications

Anti-TB:	ARVs:
Am	TDF (Rare)
Km	
Cm	
S	

Nursing Assessment

Observe for signs and symptoms such as changes in the pattern of urination, edema, impaired mental status, and shortness of breath.

Ask the patient:

- Have you had any shortness of breath during daily activities?
- Have you developed any swelling of your feet or ankles?
- Any changes in urination (frequency or amount)?

Check:

- Serum creatinine, electrolytes and BUN at least monthly while receiving Am, Km, or Cm and more frequently when indicated
- Feet, ankles and calves for signs of pitting edema
- Fluid balance (intake and output) when indicated
- Vital signs

Nursing Interventions

Seek urgent medical evaluation if:

- Serum creatinine, electrolytes or BUN are outside the normal range
- Serum creatinine result doubles from baseline result even if still within normal limits; track with monitoring tool

Counsel the patient:

- Importance of blood tests to monitor how well the patient's kidneys are clearing the medication
- Signs of fluid retention and steps to minimize

When a patient has abnormal renal function test results, discuss with the doctor:

- Whether medications require **dose adjustment*** or discontinuation

Comments

Patients with pre-existing kidney disease, diabetes or HIV are at **high risk of renal toxicity** and should be closely monitored (serum creatinine, electrolytes and BUN recommended).

Note:

*A patient with renal insufficiency requires dose adjustment of ARVs and some anti-TB medications (Am, Km, Cm, S, Lfx, Pza, Emb, Cs/Trd, PAS, Amx/Clv, Imp/Cln, and Mpm) to avoid toxicity.

Renal Toxicity/Electrolyte Disturbances

Symptoms

May be asymptomatic

Some may complain of 1 or more of the following:

Fatigue

Weakness

Muscle aches/ spasms

Behavior or mood changes

Nausea

Vomiting

Confusion

Possible Offending Medications

Anti-TB:	ARVs:
Cm	TDF (Rare)
Am	
Km	
S	

Nursing Assessment

Observe for signs of confusion, fatigue and extreme weakness.

Ask the patient:

- How have you been feeling?
- Have you been vomiting or having episodes of diarrhea?
  If yes, how frequently?
- Are you having any aches or pains?
  If yes, have patient describe further.

Check:

- Serum electrolytes (potassium, calcium, magnesium), albumin and creatinine clearance
- Vital signs

Nursing Interventions

Seek urgent medical evaluation when patient shows signs of confusion and extreme weakness, if newly identified arrhythmia, or when severe hypokalemia (< 2.0 mEq/L).

Counsel the patient:

- Nutrition support strategies (e.g., good sources of potassium, magnesium and calcium such as ripe banana, green vegetables, sweet potato/yam and milk products)
- Drink plenty of fluids throughout the day
- Importance of monthly blood tests

When patient shows signs of dehydration or abnormal serum electrolytes, discuss with the doctor:

- Whether **oral*** or intravenous rehydration is needed
- Whether electrolyte replacement (**oral*** or IV) is indicated
- Whether to obtain ECG and discontinue use of medications that prolong the QTc interval (see cardiac side effect page for link to websites that list medications associated with QTc prolongation)

Comments

Diarrhea and/or vomiting can contribute to electrolyte disturbances.

Renal toxicity and electrolyte disturbances are more common and severe in HIV-infected patients, often requiring hospitalization to closely monitor and correct.

Hypomagnesemia may be the underlying cause of hypocalcemia or hypokalemia and should be corrected if present.

A lengthened QTc interval is a marker for the potential of ventricular tachyarrhythmias like *torsades de pointes* and a risk factor for sudden death.

Note:

*Oral magnesium and/or calcium supplements should not be administered within 2 hours before or after the FQ as it can interfere with FQ absorption.

NOTE: Severe electrolyte disturbances can lead to uncontrollable muscle spasms, paralysis and life-threatening cardiac arrhythmias.

Notes

Endocrine

Hypothyroidism

Dysglycemia

Endocrine / Hypothyroidism

Symptoms

Some combination of the following symptoms:

- Fatigue
- Sleepiness
- Weight gain
- Dry skin
- Constipation
- Muscle aches
- Hair loss or dryness
- Impaired memory
- Slow heart rate
- Decreased libido
- Depression
- Feeling cold even in warm environments

Possible Offending Medications

Anti-TB:	ARVs:
Eto/Pto	d4T
PAS	

Nursing Assessment

Observe for signs of goiter.

Ask the patient:

- Does your fatigue prevent you from doing your normal daily activities?
- Any changes from normal bowel movement pattern?
- For female patients, any changes in menstruation?

If yes on any of the above, describe.

- When did you first notice these symptoms?

Check:

- Vital signs with attention to temperature, pulse and respirations
- TSH
- O_2 saturation

Nursing Interventions

Seek further medical evaluation if the patient shows signs of hypothyroidism.

Counsel the patient:

- Importance of keeping well hydrated and eating foods high in fiber to prevent and/or address constipation
- Use of extra clothing or blankets to keep warm; avoid external heat sources
- Use moisturizing lotion to relieve dry-skin
- Deep breathing and exercise as tolerated
- When thyroid medication is prescribed, it should be taken at the same time daily, without food and is usually stopped once DR-TB treatment is completed

Discuss with the doctor:

- Whether thyroid replacement is needed (e.g., if TSH is 1.5-2 times the upper limit of normal)

Comments

PAS and Eto/Pto, especially in combination, can commonly cause hypothyroidism which is reversible on stopping these medications. Obtain baseline TSH and monitor again every 3-6 months during treatment when patient is taking Eto, Pto, or PAS.

Some foods (e.g., soy, kale, broccoli, cauliflower and cabbage), medication (antacids), and supplements (Ca, iron) may reduce absorption of levothyroxine.

Endocrine / Dysglycemia *(disturbed blood sugar regulation)*

Symptoms

Some combination of the following symptoms:

- Fatigue
- Unusual thirst
- Frequent urination
- Confusion
- Headache
- Dizziness
- Hunger
- Irritability

Possible Offending Medications

Anti-TB:	**ARVs:**
Gfx	**Protease inhibitors**
Mxf	AZT
Lfx	d4T
Eto/Pto	ddI
Lzd	

Nursing Assessment

Observe for signs of confusion.

Ask the patient:

- Have you had problems with your blood sugar in the past?
- Frequency of urination?
- What have you had to eat today?
- What are the usual foods you eat/fluids you drink?
- Are you taking any medication for your blood sugar? If so, what medicine?
- Are you taking any herbs or traditional medicine, or steroids? If so, what and how often?

Check:

- Serum glucose and HgbA1c
- Nutrition and medication assessment

Nursing Interventions

Seek urgent medical evaluation when patient shows signs of confusion or loss of consciousness.

Counsel the patient:

- Healthy nutrition and goal setting; refer for nutrition counseling if available
- Importance of adherence to treatment and coordination of care for both TB and diabetes in known diabetic patients
- Importance of good blood sugar control
- How to manage low blood sugar events

Discuss with the doctor:

- Whether adjustment to diabetes medication may be needed if patient is also a diabetic on treatment
- Whether gastric motility treatment may be beneficial (e.g., metoclopramide) when symptoms of gastroparesis (e.g., nausea and vomiting along with abdominal pain, feeling of fullness after eating only a few bites) accompany the dysglycemia.
- Management of hypoglycemia

Comments

Some herbs have been shown to interact with anti-diabetic medications impacting blood sugar regulation.

Patients with diabetes tend to have slower GI motility increasing risk for nausea and vomiting with medications like Eto/Pto making glucose regulation more difficult.

Some patients without diabetes may experience hypoglycemia while on FQs.

Notes

QTc Prolongation

Cardiac

Cardiac / QTc Prolongation

Symptoms

- Change in heart beat
- Dizziness
- Fainting
- Palpitations

Possible Offending Medications

Anti-TB:	ARVs:
Bdq	**RPV**
Dlm	**EFV**
Gfx	**SQV/r**
Mfx	
Lfx	
Cfz	

Nursing Assessment

Observe for and refer for immediate medical attention if patient shows signs/symptoms of cardiac toxicity including tachycardia, syncope and/or weakness and dizziness.

Ask the patient:

- What other medicines are you taking?
- Any prior history of heart problems?

Check:

- Vital signs
- ECG
- Serum electrolytes (potassium, calcium, magnesium), serum creatinine, and LFTs

Nursing Interventions

Seek immediate medical evaluation if patient shows symptoms of cardiac toxicity including tachycardia, syncope and/or weakness and dizziness.

Counsel the patient:

- Report any symptoms of irregular heartbeat
- Nutrition support if electrolyte imbalance

Discuss with the doctor:

- Whether electrolyte replacement may be indicated if serum electrolyte abnormalities develop
- Whether adjustment to drug dosages may be indicated if renal or hepatic impairment develops

Comments

Bdq can affect the heart's electrical activity leading to an abnormal and potentially fatal heart rhythm.

Serum electrolyte abnormalities may lead to QTc prolongation and sudden death.

Patients receiving Bdq or Dlm or a combination of other QTc prolonging medications (e.g., Mfx+Cfz) should have baseline ECG and ECG monitoring during treatment as per national guidelines.

For list of other drugs with QTc prolongation risk, see:
www.qtdrugs.org
or
www.crediblemeds.org

Note:

If patient is taking Bdq or Dlm, do not give ondanestron as an anti-emetic as it may prolong QTc.

Notes

Hypersensitivity

Rash

Anaphylaxis

Hypersensitivity / Rash

Symptoms

Skin rash

Itching

Possible Offending Medications

Anti-TB:	ARVs:
Inh	**ABC**
Rif	**NVP**
Emb	**EFV**
Pza	**d4T**
Eto/Pto	and others
PAS	
FQs (Lfx, Mfx)	
any others	

Nursing Assessment

Observe for signs of serious rash/allergic reaction (fever, urticaria, blistering of the skin, lips or eyes swelling)

Ask the patient:

- Are you allergic to any medicines?
- Any other known allergies?
- What other medicines or remedies have you been taking or using?
- When did you first notice the reaction?

Check:

- Vital signs
- For signs of angioedema (e.g., swelling of face, hands, feet, or throat)
- If CBC and/or LFTs are abnormal

Nursing Interventions

Hold medication and seek further medical evaluation if:

- Patient shows signs of serious allergic reaction (e.g., angioedema)
- Hematologic or liver function abnormalities are present
- Patient is febrile

For minor skin reactions, counsel the patient:

- Moisturizing lotion may be helpful if skin reaction is due to dry skin and itching (common with Cfz)

Document the allergic reaction in the patient's Treatment Card or medical record.

Discuss with the doctor use of:

- Antihistamine
- Hydrocortisone cream for local rash
- Low dose prednisone (e.g.,10-20 mg daily for several weeks) if no response to other measures

Comments

Any medication can cause hives (urticaria).

Consider other potential causes of rash:

- Other medication patient may be taking (e.g., cotrimoxazole) including herbal or traditional medicine
- Scabies or other infectious agent
- Environmental agent

Some rashes may be accompanied by hepatitis so LFTs should be checked.

Never re-challenge with a medication that may have caused Stevens-Johnson syndrome (a rare but serious drug reaction resulting in severe blistering and peeling of the skin; swelling of the mucous membrane may also occur).

Note:

Any medication determined to cause a serious reaction should not be used again and should be documented as a known drug allergy in the patient's medical record.

Hypersensitivity/Anaphylaxis

Symptoms

- Rapid onset of rash
- Swelling of airway
- Hypotension
- Gastrointestinal symptoms

Possible Offending Medications

Anti-TB:	**ARVs:**
Any drug	**ABC**
	NVP
	EFV
	d4T
	and others

Nursing Assessment

Observe for and refer for immediate medical attention if patient shows signs/symptoms of anaphylaxis (rapid development of rash, swelling of airway, hypotension and gastrointestinal symptoms)

Nursing Interventions

Initiate standard emergency protocol including performing basic life support by maintaining the patient's airway, breathing and circulation then **refer for hospitalization and emergency care.**

Once the allergic reaction has been controlled and/or patient transferred for emergency care, **document the reaction.** If a specific medication is identified as the culprit, document on the Treatment Card or patient's medical record as a known drug allergy.

Counsel the patient:

- Never to use the offending medication again and to avoid medications from the same drug class.

Comments

Anaphylaxis is rare but one of the most severe manifestations of allergic reactions.

If a particular medication has been identified as the likely culprit, do not re-challenge with this medication and suspend its use permanently.

Notes

Hypersalivation

Hypersalivation

Symptoms

Excessive saliva production

Possible Offending Medications

Anti-TB:

Eto/Pto

Nursing Assessment

Ask the patient:

- When did you begin to experience this symptom?
- What have you tried to help relieve this symptom?
- How bothersome is this symptom for you?

Check:

- Pregnancy test for female patient

Nursing Interventions

Counsel the patient:

- Many conditions can cause this symptom
- Brushing teeth and use of mouthwash may have a drying effect which may decrease the symptom
- Some have found relief from sucking on hard candy/sweets

When excessive saliva is considered troublesome to the patient, discuss with the doctor:

- Whether referral for further evaluation may be indicated

Comments

Other conditions known to cause excessive salivation include:

- Pregnancy
- Gastroesophageal reflux
- Pancreatitis
- Liver disease
- Serotonin syndrome
- Oral ulcers and/or infections
- Some neurological disorders
- Toxins (mercury, copper, organophosphates and arsenic)
- Other infections that impair clearance of saliva (e.g., tonsillitis)

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Appendix A: Pain Assessment Method

As pain is subjective, self-report is considered the gold standard and the most accurate measure of pain. The PQRST pain assessment method will help nurses to accurately assess, describe and document a patient's pain, important for determining appropriate treatment options and for evaluating response to treatment.

Identify the PQRST pain characteristics

P Precipitating and Palliation (relieving) factors

Ask:

- What makes your pain worse?
- What makes your pain better?
- What previous treatment have you tried to relieve your pain?
- Were they effective?

Q Quality of pain

Ask:

- What does your pain feel like?
- What words would you use to describe your pain? (e.g., burning, stabbing, sharp or dull, gnawing, shooting, crushing, throbbing, nauseating, etc.)

R Region (location) and Radiation of pain

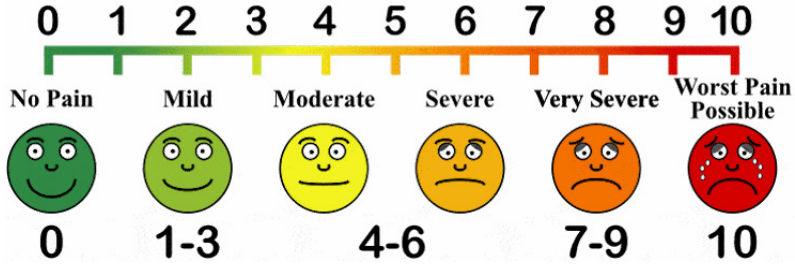
Ask:

- Where is the pain located?
- Where did the pain start?
- Does the pain move anywhere? **If yes,** describe.

S Severity of pain

Ask:

- On a scale of 0 to 10 with 0 being no pain and 10 being the worst pain you can imagine, how much does it hurt right now? (see Wong-Baker FACES next column for severity score rating)
- How much does it hurt at it's worst?
- How much does it hurt at it's best?
- Does your pain prevent you from doing any normal activities?
- Does the pain force you to sit down, lie down or slow down?



T Temporal factors (timing)

Ask:

- When did your pain start? What were you doing when it started?
- How often does it occur? (hourly, daily, weekly, monthly)
- Has its intensity changed?
- How long does it last or is it continuous?
- Is the pain sudden or gradual?
- Does the pain ever occur before, during or after meals?
- Is the pain accompanied by any other signs or symptoms?

Document the patient's responses

Careful and complete documentation demonstrates that the nurse is taking the proper steps to ensure that that the patient receives high quality nursing care and management of pain. Document the following:

- Patient's ability to assess pain level and response using the 0-10 pain scale.
- Any changes from prior assessment and following any intervention applied (medical or nursing measures).
- Patient satisfaction with pain level following the intervention. If the patient's pain level is not acceptable, indicate what actions were taken.
- Communications with the treating clinician. Always report any change in the patient's condition.
- Patient education provided and patient's response to instruction provided. Don't write "patient understands" without a supportive evaluation such as patient can verbalize, demonstrate, describe, etc.

Appendix B: PHQ-9 Depression Screening Tool

NAME: _____ **DATE:** _____

Over the last 2 weeks, how often have you been bothered by any of the following problems?

(use "✔" to indicate your answer)	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead, or of hurting yourself in some way	0	1	2	3
add columns:		+	+	

Healthcare professional:
For interpretation of TOTAL, please refer to accompanying scoring card.

TOTAL:

10. If you checked off **any** problems, how **difficult** have these problems made it for you to do your work, take care of things at home, or get along with other people?	Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult

Instructions for Use

for doctor or healthcare professional use only

PHQ-9 Quick Depression Assessment

For initial diagnosis:

1. Patient completes PHQ-9 Quick Depression Assessment.
2. If there are at least 4 ✔s in the blue highlighted section (including Questions #1 and #2), consider a depressive disorder. Add score to determine severity.
3. **Consider Major Depressive Disorder**
   If there are at least 5 ✔s in the blue highlighted section (one of which corresponds to Question #1 or #2)

   Consider Other Depressive Disorder
   If there are 2 to 4 ✔s in the blue highlighted section (one of which corresponds to Question #1 or #2)

Note: Since the questionnaire relies on patient self-report, all responses should be verified by the clinician and a definitive diagnosis made on clinical grounds, taking into account how well the patient understood the questionnaire, as well as other relevant information from the patient. Diagnoses of Major Depressive Disorder or Other Depressive Disorder also require impairment of social, occupational, or other important areas of functioning (Question #10) and ruling out normal bereavement, a history of a Manic Episode (Bipolar Disorder), and a physical disorder, medication, or other drug as the biological cause of the depressive symptoms.

To monitor severity over time for newly diagnosed patients or patients in current treatment for depression:

1. Patients may complete questionnaires at baseline and at regular intervals (eg, every 2 weeks) at home and bring them in at their next appointment for scoring or they may complete the questionnaire during each scheduled appointment.
2. Add up ✔s by column. For every ✔:
   Several days = 1 More than half the days = 2 Nearly every day = 3
3. Add together column scores to get a TOTAL score.
4. Refer to the accompanying PHQ-9 Scoring Card to interpret the TOTAL score.
5. Results may be included in patients' files to assist you in setting up a treatment goal, determining degree of response, as well as guiding treatment intervention.

Appendix B: PHQ-9 Depression Screening Tool

Instructions for Use

continued from previous page

PHQ-9 Scoring Card for Severity Determination

for healthcare professional use only

Scoring — add up all checked boxes on PHQ-9

For every ✔:

0 = Not at all

1 = Several days

2 = More than half the days

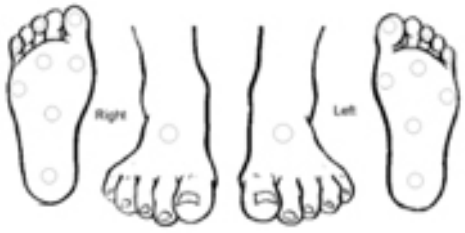
3 = Nearly every day

Interpretation of Total Score

Total Score	Depression Severity
1-4	Minimal depression
5-9	Mild depression
10-14	Moderate depression
15-19	Moderately severe depression
20-27	Severe depression

Appendix C: Peripheral Neuropathy Evaluation Tool

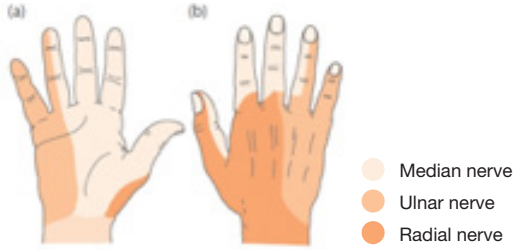
Lower Extremities



PATIENT'S INTERVIEW Ask your patient the following questions:

		Yes	No
Question 1:	**Do you have any pain in your feet?**		
Question 2:	**Does your pain have any of these characteristics?**		
	a Burning?		
	b Freezing pain?		
	c Electric shock-type sensation?		
Question 3:	**Do you have any of these symptoms in the area?**		
	a Tingling		
	b Prickling		
	c Numbness		
	d Stinging/itching		
Question 4:	**Is the pain made worse with the touch of clothing or bed sheets?**		
Question 5:	**PATIENT'S ASSESSMENT**		
	a Hypoesthesia to touch		
	b Hypoesthesia to prick		
	c Extreme sensitivity to touch		
	d Extreme sensitivity to prick		

Upper Extremities



PATIENT'S INTERVIEW Ask your patient the following questions:

		Yes	No
Question 1:	**Do you have any pain in your hands?**		
Question 2:	**Does your pain have any of these characteristics?**		
	a Burning?		
	b Freezing pain?		
	c Electric shock-type sensation?		
Question 3:	**Do you have any of these symptoms in the area?**		
	a Tingling		
	b Prickling		
	c Numbness		
	d Stinging/itching		
Question 4:	**Is the pain made worse with the touch of clothing or bed sheets?**		
Question 5:	**PATIENT'S ASSESSMENT**		
	a Hypoesthesia to touch		
	b Hypoesthesia to prick		
	c Extreme sensitivity to touch		
	d Extreme sensitivity to prick		

Appendix D: Side Effect Monitoring Checklist

Symptom/complaint	1	2	3	4	5	6	7	8	9	10	11	12
Nausea												
Vomiting												
Abdominal pain												
Diarrhea												
Loss of appetite												
Fatigue												
Headache												
Dizziness												
Joint pain / arthralgia												
Muscle pain or cramping												
Vision changes/problem												
Hearing loss												
Ringing in ears / tinnitus												
Loss of balance												
Tingling/numbness (hands/feet)												
Insomnia or sleep problems												
Agitation / irritability												
Difficulty concentrating												
Feeling hopeless or depressed												
Suicidal thoughts												
Hallucinations												
Memory problems												
Confusion												
Lower limb swelling (edema)												
Frequent bruising/nose bleeds												
Irregular or racing heartbeat												
Skin rash or hives (urticaria)												
Yellowing of eyes (sclera)												
Seizure/convulsion												

NAME: _____

MONTH: _____ **REGIMEN:** _____

13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

ISBN 978-92-95099-53-1