



# Simulation training to prevent the transmission of microorganisms during home visits.







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Version date: 01/10/2024 Author: Isabela Galvão Fernandes Alves Supervisor: Prof. Dra. Maria Clara Padoveze Simulation script as a result of the master dissertation: "Precautions to prevent the transmission of microorganisms during home visits: construction and validation of an interprofessional simulation scenario". Alves IGF. Precautions to prevent the transmission of microorganisms during home visits: construction and validation of an interprofessional simulation scenario. [dissertation]. São Paulo: Escola de Enfermagem, Universidade de São Paulo; 2024.





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#### **Simulation Script**

**1- Scenario name:** Precautions for preventing transmission of microorganisms during home visits carried out by Primary Health Care (PHC) professionals.

**2- Target audience:** Two (2) health professionals with higher education and six months' experience in PHC, necessarily: one (1) professional with a full degree in Nursing and one (1) professional with a full degree in Medicine.

3- Location for the Simulation: Simulated House of a higher education institution's simulation center. Location for Prebriefing and Debriefing: Debriefing room at a higher education institution's simulation center and taken to the Simulated House to recognize the scenario.

#### 4- Time:

- · Pre-briefing 10 minutes (in debriefing room)
- · Group briefing 10 minutes (in debriefing room)
- · Individual briefing 5 minutes (at the scenario)
- · Scenario 15 minutes
- · Debriefing 30 minutes (in debriefing room)

#### Total - 70 minutes

5- Modality: Clinical Simulation

#### 6- Competences previously required for participation:

- Prevention and infection control measures: use of Standard and Specific Precautions

- Knowledge about how diseases are transmitted (aerosol/droplet/contact);

- Care management, diagnosis, and treatment of Pulmonary Tuberculosis (infected users and people who are contacting them);

- Assessment and management of stage 1 pressure injuries;

- Ability to develop interprofessional work and communication.

#### 7- Theoretical References:

Brazil. Ministry of Health. Health Surveillance Secretariat. Department of Chronic Condition Diseases and Sexually Transmissible Infections. Tuberculosis in primary care: Nursing protocol / Ministry of Health, Health Surveillance Secretariat, Department of Chronic Condition Diseases and Sexually Transmissible Infections. – Brasília: Ministry of Health, 2022.

Adaptation and implementation of WHO's multisectoral accountability framework to end TB(MAF-TB): bestpractices. Geneva: World Health Organization; 2022. Licence: CC BY-NC-SA 3.0 IGO.Available from:https://www.who.int/publications detail-redirect/9789240066069

WHO consolidated guidelines on tuberculosis. Module 3: Diagnosis – rapid diagnostics for tuberculosis detection 2021 update. Geneva: World Health Organization; 2021 (<u>https://www.who.int/publications/i/item/9789240029415</u>)

Siegel JD, Rhinehart E, Jackson M, Chiarello L. 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Health Care Settings. American Journal of Infection Control [Internet]. 2007 Dec;35(10):S65–164. Available from: https://www.cdc.gov/infectioncontrol/pdf/guidelines/isolation- guidelines H.pdf





#### 8- LEARNING GOALS:

**Main goal:** Develop clinical reasoning to implement precautionary measures (standard and specific) to prevent the transmission of microorganisms in the context of home visits.

- **Specific goals:** Apply standard and specific precautions (based on mode of transmission: contact, droplet and airborne/aerosol) during a home visit.
- Identify the main approaches to correctly implementing standard and specific precautions in the context of home care.
- Analyze interprofessional interaction and communication and their relationship to the correct application of infection prevention and control measures;

#### 9- Expected Result

It is expected that at the end of the simulated scenario, professionals will be able to:

- Recognize the risks and importance of correctly applying standard and specific precautions (based on mode of transmission) in home care;
- Apply standard and specific precautions (based on mode of transmission) in home care;
- Recognize the potential of interprofessional work as a tool to support the correct application of infection prevention and control measures.
- Feel satisfied and capable of applying IPC measures in home care settings

#### DESIGN

#### **10- Assessment Methods**

 I) Application of the instrument "Knowledge on precautions in Primary Health Care" (before and after the scenario);

II) Application of the "Interprofessional Competency Scale" (before and after the scenario).

#### 11- Pre-briefing (facilitator)

- Identification of the participating professionals' expectations of the simulation;
- Information on the general objective of the simulation;
- Information about the modality and the presence of the observer facilitator in the scenario;
- Information on the flow of the sessions (briefing, running the scenario and debriefing);
- Guidance on the role of each participant (a facilitator will accompany the scenario by observing, a facilitator will allow dialogue to take place between the simulator and the participants, and the research facilitator who guides at this point - can intervene during the scenario if necessary);
- Establishing an emotionally safe environment for participation: "The simulation environment is safe, so here you can express your opinions, criticize and make decisions. For the activity to be successful, mutual understanding and respect are expected, as well as good practice with the local simulation structure."
- Recognizing the scenario: "The scenario represents a home. In this activity, you will carry out a visit to a family member belonging to the area covered by the basic health unit. The environment consists of a living room, a bathroom and a bedroom. The visit will take place in the bedroom (consisting of a double bed, a wardrobe, a study table and a bedside table). For the setting you will bring a suitcase of medical supplies and equipment for home visits. The family's medical records will also be available for consultation before the visit. It is important that you recognize all the details so that you can facilitate the service. In this way, you should explore the setting and the resources available. You will then be sent to get to know the environment".





#### 12- Human resources for executing the scenario:

- · 02 health professionals with higher education
- · 01 facilitator (briefing/prebriefing e debriefing)
- · 01 observer facilitator
- · 01 external facilitator (voice of the simulator)

**Material resources:** Home visit suitcase containing: Stethoscope, alcohol gel, procedure gloves, gauze, micropore tape, bandages, saline solution 0.9%, (250ml), thermometer, sphygmomanometer, N95 mask, wound measuring ruler, surgical mask, protective glasses.

Simulator: high-fidelity full-body simulator





#### 13- Characterization and scripts

**Simulator characterization:** High-fidelity female simulator: Wears a pajama and is laid in bed, with pillows supporting the head and raising upper limbs. Wears diapers with no diuresis present. Presents a stage one injury on the left heel bone (calcaneus). Has a microphone placed on the clothes, able to establish communication with the professional. The simulator will be programmed with the following parameters:

- · Heart rate (78 beats per minute);
- · Respiratory rate (22 breaths per minute);
- · Present cough;
- · Lung auscultation: snoring in the right and left lungs (set to volume 8 on the simulator);

**Facilitator script:** You will receive the script for conducting this scenario. The clinical simulation will be a home visit. Use your own name to communicate with professionals. In some situations, you can establish communication with participants, such as:

• In cases of physical exams that require an immediate response and are not made available by the simulator. If the professional measures the temperature, you must answer (38°C). Blood pressure (110x70) Heart rate (78 beats per minute); Weight (76 kg). Height (1.68 m). Only say the results of vital signs when the professional performs the relevant physical exam.

· Note: do not make comments about infection prevention and control measures during the scenario. ·

Scenario closure: The scenario can be closed after both professionals notice the error and point it out to their colleague, promoting a dialog about protection and infection control measures. If you don't both notice the intentional error, end the scenario as soon as the professionals have carried out the procedures for investigating suspected pulmonary tuberculosis, and have assessed and changed the dressing on the calcaneal wound.

## External facilitator script Script for external facilitator who will be the voice of patient Adriana - The following script describes how the facilitator should prepare for the characterization and construction of the simulator's voice for interaction with the professionals during the scenario

You are Adriana, you are 42 years old and live in a vulnerable region. There is a school but few shops near your house. When it rains there are many flooded areas, the street is not paved and on some days there is no water supply. One year ago you suffered a car accident and were retired due to quadriplegia. You are married to Samuel, who is your current caregiver, and you have no children. Samuel is not at home at the moment because he went to the

supermarket. He works in the neighborhood's school as a guard in the afternoon period. He is away from work because he fell sick 3 weeks ago with "a strong flu" (you do not understand the disease and transmission methods). The home visit that you are receiving today was scheduled due to an injury in your foot; you do not know how to treat it. Three days ago you began to cough. Today, besides coughing, you felt very cold during the night, accompanied by sweat. For these reasons, the windows are closed. You are not managing to eat a lot, usually, you make three meals a day. You have not slept well since Samuel got sick. There is not much room in the house, therefore he kept sleeping with her every night. If you are questioned about your health condition today, inform: headache, coughing, you feel cold, and a little discomfort in your left foot. You do not know the name of the medications your husband is taking; you only see him taking them every day.

Observer facilitator script: You must observe the scenario in the room where the simulation is taking place





and fill out the checklist below about infection prevention and control actions. You may also add comments. Checklist (observer facilitator)

Actions performed	Physician	Nurse

	Performed		Notes/ Difficulties	Performed		Notes/ Difficulties
Correct choice of Personal Protective Equipment (PPE)	Yes ()	No ( )		Yes ()	No ( )	
Sanitizes hands	Yes ()	No ( )		Yes ()	No ()	
Correct donning/doffin g of PPE	Yes	No ( )		Yes ()	No ( )	
Checks vital signs	Yes ()	No ( )		Yes ()	No ()	





Checks appropr iate room ventilati on	Yes ()	No ( )	Yes ()	No ( )	
Checks respiratory symptoms	Yes ()	No ( )	Yes ()	No ( )	

Realizes and communicates the error regarding the precaution to avoid transmission of microorganis ms from the colleague	Yes	No ( )	Yes ()	No ( )	
Conducts a respiratory symptom check on the contact person	Yes	No ( )	Yes ()	No ( )	
Shows individual perception of the risk of exposure to infections	Yes ()	No ( )	Yes ()	No ()	

#### **Environment/physical space**

**Simulated home:** comprised of a living room with a 4-seat dining table, sofa, and telephone. Kitchen with sink, stove, microwave, refrigerator, laundry sink, and washing machine. The restroom has a toilet, shower, sink, and a trash can. The bedroom has a double bed in the closet, a desk, a bedside table, and a small trash can. There is a window in the living room and another small window in the bedroom, both closed and with curtains.





**Briefing (carried out by the facilitator researcher):** This moment will be divided into stages (individual and group), starting with the group stage. The group briefing is held in the room (the same one used for the Prebriefing and Debriefing), while the individual briefing will be held in the simulated house, leading one participant at a time to recognize the scenario and instruct on controlled error:

- Individual briefing: Moment when the facilitator will talk individually with each participant. Guide the specific role of each volunteer. At this moment there will be the delivery of the so- called "controlled error" that each professional will be instructed to make, without one knowing the other's attitude. The physician will be instructed not to sanitize big/bar banda bafara putting the glavas and
  - his/her hands before putting the gloves on.
- Guidance: "This strategy is not used to deceive you or your colleague, it is a learning strategy designed to foster interprofessional dialog with the intention of preventing possible risky attitudes or behaviors that could lead to the transmission of microorganisms. There is no value judgment on the profession of choice that makes the mistake in the scenario. This error does not alter your attitudes towards your role in the scenario (as a doctor or nurse), nor the conduct you will take in the face of the health condition described in the clinical case. You are free to choose the best moment to make this mistake, and if it is noticed and pointed out by your colleague, you can return to your role without making the mistake again."
- Remind the professional: In the context of PCI, there are two types of precautions: PP and PE. Let's briefly
  recall what each one is: "PP are defined as basic infection prevention measures that must be applied to all
  patients, at all times and regardless of the type of diagnosis or infectious state, i.e. they must be applied by
  all healthcare professionals to all patients. To achieve this measure, there are the criteria: hand hygiene;
  use of personal protective equipment; respiratory etiquette; correct allocation of patients; cleaning,
  disinfection and sterilization; environmental hygiene; care of dirty and clean clothes; safe injection
  practices. EPs are measures that complement PPs. They should be applied in suspected or confirmed
  cases of etiological agents of epidemiological importance. In this case, the criteria are aerosol precautions
  using an N95 or PFF2 mask, droplet precautions using a regular mask and contact precautions using
  gloves and an apron. Each precaution depends on the mode of transmission of some specific diseases
  during the period of transmissibility. "

· Group briefing: Moment of introduction (name, job, professional experience); question about prior experience

with simulation; inform that this will be a safe place to make errors; know the simulation environment (including the simulator)

#### Scenario development

Adriana, 42 years old, lives in a socially vulnerable area. She has an incomplete secondary education. She used to work as a babysitter, but one year ago she was retired due to quadriplegia after a car accident. She is married to Samuel, 36 years old, who is her current caregiver. He works at a school in the neighborhood and was diagnosed with pulmonary tuberculosis three weeks ago. He is following a quadruple treatment (Rifampicin 150mg/Isoniazid 75mg/ Pyrazinamide 400 mg/ Ethambutol 275mg) with the reference Basic Health Unit.

Adriana presented coughing and fever three days ago. Today there is a home visit scheduled with the basic health unit staff to assess the pressure injury.

Injury to the calcaneus region presents hyperemia and discontinuity of skin tissue.

You are part of the Primary Health Care staff responsible for home visits. The caregiver welcomed the staff at home but had to leave. Adriana is in the living room awaiting care.

You, physician, will be responsible for carrying out the clinical assessment of Adriana's symptoms. You, nurse, will be responsible for the care of the injury.





**Family medical records and exams:** Information from the family records of the Basic Health Unit in which Adriana and Samuel are enrolled will be made available. Below you find the information received by professionals: *Family medical record 1018-02-320 Full name: Adriana Silva* 

#### 04/12/2022 Team meeting

*Meeting report:* Community Health Agent Roberta informs that she visited Adriana's home and found out that she suffered a car accident and is bedridden. She informs the team that Adriana seems to be interested in visits to assist in information for managing her health conditions and adapting to the new routine, together with the husband who will be her caregiver. We included the family's home visit in the nurse and physician schedules.

#### 06/18/2022- Community Health Agent and Nurse Home Visit

*Nursing evolution:* We made a home visit at the family home. Vulnerable region, a small house with few windows, has running water, but Adriana said that on some days there is no water supply due to a lack of maintenance by the city hall.





### 11/01/2023 Consultation with a medical professional

Medical evolution:

S – Samuel mentions persistent coughing for 18 days, he feels his body is hot, and has malaise, night sweats, and a lack of appetite.

During the physical exam: flushed, acyanotic, anicteric, hydrated, febrile (38°C), good peripheral perfusion. Weight: 52 Kg, height: 1.55 m, Blood pressure: 130 x 90 mmHg, Heart rate: 89 bpm, Breathing rate: 25 ipm. Non-palpable lymph nodes

Cardiac exam: normorhythmic and normophonetic sounds in two beats, without murmurs and extrasystoles. Palpable and symmetrical pulses. Palpable heartbeat

Pulmonary exam: Inspection shows a short biotype, without scars or changes, and a barrel chest. There is a reduced expansibility on palpation at the right apex and preserved expansion at the bases and a normal thoracovocal thrill. Flat percussion at the right apex and clear lung sound at the base bilaterally. Auscultation shows decreased vesicular sounds, especially bilaterally at the apices.

I prescribe a rapid COVID-19 test to Samuel, negative result. I request the collection of the Rapid Molecular Test for TB (TRM-TB) and smear microscopy.

HD: Pulmonary TB.

I request the collection of the second smear sample to be carried out at home and brought back to the Basic Health Unit (UBS) tomorrow upon return.

I schedule a return appointment for tomorrow.

#### 11/13/2023 Consultation with a medical professional

I receive the results of Molecular Rapid Test for TB (TRM-TB), which reads: MTB DETECTED and undetected rifampicin resistance.

I request a chest X-ray and laboratory tests.

I explain the duration and importance of the treatment to be followed correctly. The patient shows anxiety about the diagnosis because he takes care of his bedridden wife. He understands the importance of the treatment and states he can follow the proposed scheme.

I ask the unit's nurse to schedule regular visits to check Samuel's treatment.

I start treatment with a basic scheme for pulmonary TB - intensive stage for 2 months:

- rifampicin 150 mg/
- · Isoniazid 75 mg/
- · pyrazinamide 400mg/
- · ethambutol 275 mg

I clarify doubts and schedule a return appointment. I fill out the Pulmonary Tuberculosis notification form. **Exams** 

Name: Samuel Silva

Date of birth: 01/08/1985 Gender: [x ] M [ ] F

Collection date: 11/01/2023 Result date: 11/13/23 Exam: Bacilloscopy

RESULT: found on average more than 10 AFB per field, in the first 20 fields observed = POSITIVE +++





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STEPS AND ACTIONS NECESSARY TO DEVELOP THE SCENARIO (15 minutes)								
Phase	Trigger (what moves the scenario forward; situations, actions , downtime)	Parameters (patient voice, vital signs)	Expected roles for each type of participant	Expected behaviors for each type of participant				
1	Patient start s coughing	Physician begins a physical examination	Physician wa s instructed to remove the mask a few times when talking to the patient	Nurse warns colleague about the need to use N95 correctly				
2	Caregiver inform s about the injury	Nurse assesses the injury	Nurse instructed not to perform hand hygiene before wearing gloves	Physician warns about the need for HH before wearing gloves				
STRATEGY IN CASE OF ESCAPE FROM THE PROPOSED GOALS •Strategy 1: The facilitator present at the scene will be instructed to increase the simulator's coughing. • Strategy 2: The facilitator representing the simulator's voice should verbalize to the team that her husband is being treated for tuberculosis.								
INTERPROFESSIONAL DEBRIEFING (group)								
<ul> <li>The debriefing script is based on Promoting Excellence and Reflective Learning in Simulation (PEARLS) and was adapted for the context of Infection Prevention and Control.</li> <li>Clarification about the <i>debriefing</i> session: We will spend up to 30 minutes with the briefing which consists of four phases. First, I am interested in knowing how you are feeling about this case; next, I ask you to describe this case. Afterwards, we will explore actions that were performed well and actions that you would do differently.We will finish by summarizing</li> </ul>								

some points that you may take as learning to be applied in clinical practice.

Debriefing Strategy: (PEARLS)

Goal	Task	Approach





1- Preparing the ground	Create a safe context for learning	Establish the goal of debriefing	<ul> <li>This moment is intended for debriefing, for this, we will use 30 minutes. Our goal is to improve our interprofessional way of working to improve patient care.</li> </ul>
2- Reaction	Explor e feeling s	Request initial reaction and emotions	<ul> <li>How are you feeling after the scenario?</li> <li>What was the initial reaction to the case?</li> </ul>
3- Description	Clarify facts	Develop a common understandi ng of the case	<ul> <li>Please, could you give a quick summary of the case?</li> <li>What was the main diagnosis of the case?</li> <li>Was there a need for specific precautions, depending on the mode of transmission?</li> <li>How would you describe the interprofessional care in this case?</li> <li>What would the correct placement and removal of the N95 mask look like in this case?</li> </ul>
4- Analysis	Explore the different performan ce domains		<ul> <li>I would like to spend some time talking about home care with patients suspected of having transmissible diseases. How did you prepare for this case?</li> <li>How was the experience of interprofessional work, did you think of any communication strategies during the care?</li> <li>At any point did the infrastructure of the home environment harm or contribute to precautions against microorganism transmission?</li> <li>Did you notice any mistakes made by the other professional that could increase the microorganism transmission during care?</li> </ul>
5- Application/Summary	Identify ke y lessons	Participant centered	<ul> <li>What lessons do you take into clinical practice in the context of infection prevention and control?</li> <li>Did the scenario contribute to a change in behavior in view of the error made by another healthcare professional?</li> </ul>





Any questions or concerns?