

E X E R C I S E 14

Hand-washing

OBJECTIVES

At the conclusion of the exercise, you should...

1. understand the importance of hand-washing.
2. understand the importance of using a disinfectant when scrubbing for a hospital procedure.
3. recognize some common microorganisms found on the human skin.
4. define the terms “nosocomial,” “contaminant,” “transient,” and “resident,” when referring to microorganisms.

INTRODUCTION

It is common for a wide variety of microorganisms to exist on the skin of the human body. Since the skin of your hands comes in contact with many different objects, it is quite natural to assume that one's hands may easily become “instruments” of potential contamination of food, wounds, etc. This becomes very important when considering the causes of nosocomial (hospital-acquired) infections. In this exercise, you will be determining the general effectiveness of hand-washing and the use of a disinfectant as a means of controlling the microflora of your hands.

MATERIALS

Media:

3 TSA plates

Supplies:

1 alcohol swab

PROCEDURES

Day 1

Technical Background

The microbes found on human hands may be either **transients** (contaminants) or **residents** (part of the **normal flora**). **Nosocomial** infections are infections that are spread in a hospital environment.

Medical Asepsis: Hand-washing

Before hand-washing:

1. Label 3 TSA plates “Before Washing,” “After Washing” and “After Alcohol.”
2. Test your right hand for bacteria by firmly pressing your fingertips and fingers into the agar of the plate labeled “Before Washing”.

Wash your hands with soap and water as follows:

1. Remove jewelry; push wristwatch to mid-forearm; roll or push up sleeves to mid-forearm.
2. Check hands for hangnails, cuts, or obviously dirty areas. These places need extra cleaning.
3. Turn on water with the foot pedal (or have your partner turn on the faucet).
4. Apply liquid soap and rub hands. Interface fingers to wash between them. Rub palms and back of hands in circular motion. Pay special attention to knuckles and fingernails.
5. Continue soaping for 15 seconds.
6. Rinse with hands in down position: forearm to wrists to fingers.
7. Blot dry with towel: hands to wrists to forearms.
8. Turn off water faucet with clean, dry towel if foot pedal is not in use.
9. Test your right hand for bacteria again by firmly pressing your fingertips and fingers into the agar of the plate labeled “After Washing”
10. Disinfect the fingers of the same hand with alcohol swabs:
11. Test your hand for bacteria a third time by firmly pressing your fingertips and fingers into the agar labeled “After Alcohol
12. Incubate all TSA plates at 35°C until the next lab period.

Notes:

1. Bar soap retains bacteria; liquid soap is far more sanitary.
2. Soap is essential to remove oils, grease, and bacteria trapped on the skin.
3. Do not touch anything after washing and drying the hands. Go directly to patient care!

PROCEDURES

Day 2

Technical Background

Guidelines for estimating growth:

- 4+ = abundant colonies on much of the area of the plate that had contact with the hand and fingers
- 3+ = a lot of colonies on about half of the contact area
- 2+ = some colonies on about 1/4 of the contact area
- 1+ = very few colonies
- 0 = no colonies

Recording Your Results

1. Quantify (estimate) the growth on all the plates using the guidelines listed above.
2. Describe the number and color of any isolated colonies.
3. Record all of the results in the evaluation portion of the Data section.
4. Record the results on the class boards and discuss.

EVALUATION OF RESULTS (EXERCISE 14: HAND-WASHING)

Purpose

Data

TSA Plate	Quantitative 1 - 4+	Colony Description	Gram Stain of Colony (if desired)
Unwashed colony 1 colony 2			
Partners colony 1 Partners colony 2			
Washed colony 1 colony 2 Partners colony 1 Partners colony 2			
Disinfected colony 1 colony 2 Partners colony 1			
Partners colony 2			

CONCLUSIONS, DISCUSSIONS, AND QUESTIONS

1. From your results, how effective was hand-washing and the use of alcohol in reducing the microflora of your hand?
2. Were your results what you expected? Discuss the reasons for the results you observed.
3. Briefly define and differentiate between resident and transient microorganisms.
4. List four genera of microorganisms that can be part of the “normal flora” of the skin.
5. Name three sources of pathogenic bacteria that might contaminate someone’s hands and then get transferred to patient by contact.

