CHAPTER 19
Specimen Collection and Diagnostic Examination

Diagnostic Examination
- Performed by a physician at the patient’s bedside or in a specially equipped room
- The PT’s knowledge and organization of the diagnostic procedure can be the keys to success.

Informed Consent
- Informed consent: The patient must fully understand what will be done during a test, surgery, or any medical procedure and must understand the risks and implications before he or she can legally consent to it.
Diagnostic Examination

Nurse’s Responsibilities
- Reinforce physician’s explanation of the procedure; confirm that the patient comprehends it; and verify that written consent is not always necessary for an individual test; informed verbal consent may be adequate.
- Anticipate the needs of the physician and have proper supplies ready.
- Keep the patient adequately informed of procedural details that could cause discomfort.

Preparing the Patient for Diagnostic Examinations
- The nurse must be prepared to answer questions for which the patient may need clarification.
- The patient needs to know if
  - Nothing can be taken by mouth (NPO) after midnight
  - Breakfast will be held until the examination is complete
  - A special room or piece of equipment is required for the test
  - Medication is needed before or during the test
Specimen Collection

All patients admitted to a health care facility have at least one laboratory specimen collected during hospitalization.

Laboratory examination of specimens of urine, stool, sputum, blood, and wound drainage provides important information about body functioning and contributes to the assessment of health status.

Specimen Collection

Guidelines for Specimen Collection

- Consider the patient’s need and ability to participate in specimen collection procedures.
- Recognize that the collection of a specimen may provoke anxiety, embarrassment, or discomfort.
- Provide support for patients who are fearful about the results of a specimen examination.
- Recognize that children require clear explanation of procedures and that they need the support of their parents.

Specimen Collection

Guidelines for Specimen Collection (continued)

- Wear gloves when collecting specimens of blood or other body fluids.
- Wash hands and other skin surfaces immediately and thoroughly if contaminated with blood or body fluids; wash hands immediately after removing gloves.
- Collect specimens in appropriate containers, at the correct time, and in
Specimen Collection

Guidelines for Specimen Collection (continued)

- Most specimens are transported to the laboratory in a separate outer plastic bag.
- Deliver specimens to the laboratory within the recommended time or ensure that they are stored properly for later transport.
- Use aseptic technique in all collections to prevent contamination, which can cause inaccurate test results.

Figure 19-1

![Image of a specimen collection](image)

Enclose specimen in a plastic bag.

(From Elkin, M.K., Perry, A.G., Potter, P.A. [2004]. Nursing interventions and clinical skills [3rd ed.]. St. Louis: Mosby.)

Specimen Collection

Collecting a Midstream Urine Specimen

- Midstream urine specimen
  - Urine is collected after voiding is initiated (midstream) and before voiding is completed.
  - This is the cleanest part of the voided specimen.
- Several tests can be ordered on one sample of urine: pH, protein, glucose, ketones, blood, and specific gravity.

Nurse’s responsibilities
Skill 19-2: Step 2

Collecting a midstream urine specimen.

(From Elkin, M.K., Perry, A.G., Potter, P.A. [2004]. Nursing interventions and clinical skills (3rd ed.). St. Louis: Mosby.)

Skill 19-3: Step 7a

Collecting a midstream urine specimen.

(From Elkin, M.K., Perry, A.G., Potter, P.A. [2004]. Nursing interventions and clinical skills (3rd ed.). St. Louis: Mosby.)

Specimen Collection

Collecting a Sterile Urine Specimen

- Two methods
  - Insert a straight catheter into the urinary bladder and remove urine.
  - Obtain a specimen from the port of an indwelling catheter using sterile technique.
- Residual urine
  - This is urine left in the bladder after voiding.
  - The patient voids, and catheterization is performed within 10 minutes.
  - Residual urine is more than 50 ml of urine remaining in the bladder.
Specimen Collection

Collecting a 24-Hour Urine Specimen
- This is required for test of renal function and urine composition.
- The entire volume of urine from a 24-hour period is collected.
- If urine is accidentally discarded or contaminated or patient is incontinent, restart time period.

Specimen Collection

Measuring Blood Glucose Levels
- The use of a meter to measure blood glucose is a more meaningful test for use by persons with diabetes than testing urine for the presence of glucose.
- A skin puncture can be easily performed by the patient at home and provides more accurate information than does the urine glucose/acetone determination test.

Skill 19-5: Step 2

Measuring blood glucose levels.

(From Elkin, M.K., Perry, A.G., Potter, P.A. [2004]. Nursing interventions and clinical skills (3rd ed.). St. Louis: Mosby.)
Skill 19-5: Step 14

Measuring blood glucose levels.

(From Elkin, M.K., Perry, A.G., Potter, P.A. [2004]. Nursing interventions and clinical skills (3rd ed.). St. Louis: Mosby.)

Skill 19-5: Step 16

Measuring blood glucose levels.

(From Elkin, M.K., Perry, A.G., Potter, P.A. [2004]. Nursing interventions and clinical skills (3rd ed.). St. Louis: Mosby.)

Skill 19-5: Step 17a

Measuring blood glucose levels.

(From Elkin, M.K., Perry, A.G., Potter, P.A. [2004]. Nursing interventions and clinical skills (3rd ed.). St. Louis: Mosby.)
Skill 19-5: Step 17b

Measuring blood glucose levels.

(From Elkin, M.K., Perry, A.G., Potter, P.A. [2004]. Nursing interventions and clinical skills (3rd ed.). St. Louis: Mosby.)

Specimen Collection

Collecting a Stool Specimen

- Stool specimens are collected and examined for a variety of reasons.
  - Determine the presence of infection, bleeding, or hemorrhage
  - Observe the amount, color, consistency, and presence of fats
  - Identify parasites, ova, and bacteria

The PT collects the feces, labels the specimen, sends the specimen and laboratory request to the laboratory.

- Stool to be examined for parasites must be taken to the laboratory immediately
- Stool specimen for ova and parasite (O&P) examination must be collected in an appropriate container with a special solution.

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Skill 19-6: Step 8

Collecting a stool specimen.


Skill 19-6: Step 9

Collecting a stool specimen.


Specimen Collection

Determining the Presence of Occult Blood in Stool (Guaiac)

- **Bright red blood** indicates the blood is fresh and that the site of bleeding is in the lower gastrointestinal tract.
- **Black, tarry feces** indicates the presence of old blood and that the site of bleeding is higher in the GI tract.
- **Occult** indicates blood is present in the stool but cannot be seen without a microscope.
Skill 19-7: Step 8a

Determining the presence of occult blood in stool.

(From Elkin, M.K., Perry, A.G., Potter, P.A. [2004]. Nursing interventions and clinical skills (3rd ed.). St. Louis: Mosby.)

Specimen Collection

Collecting a Sputum Specimen

- It must come from deep in the bronchial tree.
- Early morning is the best time to collect a specimen, because the patient has not yet cleared the respiratory passages.

Skill 19-9: Step 14

Collecting a sputum specimen by suction.

(From Elkin, M.K., Perry, A.G., Potter, P.A. [2004]. Nursing interventions and clinical skills (3rd ed.). St. Louis: Mosby.)
Skill 19-9: Step 18

Collecting a sputum specimen by suction.

(From Elkin, M.K., Perry, A.G., Potter, F.A. [2004]. Nursing interventions and clinical skills (3rd ed.). St. Louis: Mosby.)

Skill 19-10: Step 8

Collecting a sputum specimen by expectoration.


Specimen Collection

Many tests can be performed on sputum.

- Culture
  - Cultivation of microorganisms or cells
- Sensitivity
  - Determining the effectiveness of antibiotics
- Cytology
  - Study of cells
- Acid-fast bacillus
  - Organism responsible for tuberculosis
Specimen Collection

Obtaining a Wound Culture

- Aerobic organisms
  - Grow in superficial wounds exposed to the air
  - Specimen collected by inserting a sterile swab (picture next slide)

Figure 19-3

Wound culture tube.


Figure 19-4

Aerobic culture tube.

(From Elkin, M.K., Perry, A.G., Potter, P.A. [2004]. Nursing interventions and clinical skills [3rd ed.]. St. Louis: Mosby.)
Specimen Collection

Obtaining a Wound Culture
Anaerobic organisms
- Grow within body cavities
- Specimen collected by using a sterile syringe tip to aspirate visible drainage from the inner wound, expelling any air from the syringe, and injecting the syringe contents into a special vacuum container with culture medium.

Obtaining a Throat Culture
- Ask patient to open mouth and say "ah."
- If pharynx is not visualized, depress tongue with tongue blade and note inflamed area of pharynx and tonsils.
- Insert swab without touching lips, teeth, tongue, or cheeks.
- Gently but quickly swab tonsillar area side to side, making contact with inflamed or purulent sites.
- Immediately place swab in culture tube and crush ampule at bottom of tube.
- Securely attach properly completed label and requisition slip to side of specimen container.
- Enclose in a plastic bag.
- Send specimen immediately to laboratory or refrigerate.
- Patient teaching
Documentation

- Complete procedure by documenting the following:
  - Time
  - Type of specimen
  - Sent to laboratory with requisition slip
  - Patient response

Specimen Collection

Collecting a Blood Specimen (Venipuncture)
- Veins are a major source of blood for this type of testing.
- Blood tests can yield valuable information about nutritional, hematological, metabolic, immune, and biochemical status.

Specimen Collection

Possible risks of venipuncture
- Anticoagulant therapy
- Low platelet count
- Bleeding disorders
- Presence of arteriovenous shunt or fistula
- After breast or axillary surgery performed on that side
Figure 19-7


Figure 19-8

Vacutainer tube guide.
Skill 19-13: Step 17b(6)

Performing the venipuncture.

Specimen Collection

Collecting a Blood Specimen

- Collection tubes
  - Tubes come in different sizes.
  - Blood test ordered determines the amount of blood needed.
  - Some tests require additives—chemicals that preserve blood until testing.
  - Rubber stoppers are color coded. The color coding signals the type of additive, the amount of blood to collect, and the recommended tests.
  - The collection tube must be labeled with the patient’s identifying information.

Figure 19-9

Labeling the blood tube.
Collection Sites


Performing the venipuncture.

Electrocardiogram

(ECG or EKG) is a graphic representation of electrical impulses generated by the heart during a cardiac cycle. It identifies abnormalities that interfere with electrical conduction through cardiac tissue. This procedure is usually done at the patient’s bedside.
Skill 19-14: Step 10b

Performing an electrocardiogram (ECG).

(From Sorrentino, S.A. [2004]. Assisting with patient care [2nd ed.]. St. Louis: Mosby.)

Performing an electrocardiogram (ECG).


End Of Presentation