Administering parenteral medications is a rather common task performed by medical assistants in today’s health care settings. Learning how to properly administer parenteral medications will help ensure that the medication is deposited within the correct tissue and prevent the patient from experiencing any needless complications or injuries. Gaining the skills introduced in this chapter will be beneficial for the majority of health care settings where medical assistants work including family practice, urgent care, specialty offices, and clinics.

**NOTE SHEET**

**Administration of Parenteral Medications**

**Routes of Administration**

**Parenteral Complications**

**Immunizations**
VOCABULARY REVIEW
Assignment 34-1: Definitions
Define the following terms.

1. Ampule: ________________________________
2. Aqueous: ________________________________
3. Bolus: ________________________________
4. Cannula: ________________________________
5. Diluent: ________________________________
6. Gauge: ________________________________
7. Occlusion: ________________________________
8. Parenteral: ________________________________
9. Phlebitis: ________________________________
10. Precipitate: ________________________________
11. Taut: ________________________________
12. Vial: ________________________________

Assignment 34-2: Misspelled Words
Underline the correctly spelled term.

1. Aspirate Asporate Asipirate
2. Hypudermic Hyperdermic Hypodermic
3. Infiltration Infiltrashion Infiltration
4. Patency Patoncy Patiency
5. Thrombisis Thrombosis Thormbosis
6. Viscocity Viscosity Visocity
7. Wheal Wheel Weal
Assignment 34-3: Matching I

Match the term with its definition and place the corresponding letter in the blank.

1. Cartridge unit
   A. The second drug to be drawn up; usually the cloudier medication
2. Cubic centimeter
   B. Within the muscle
3. Extravasation
   C. Threaded end in which the needle can be locked by twisting
4. Intra-articular
   D. First drug to be drawn up when combining two drugs into one syringe; often the clearer medication
5. Intradermal
   E. Within a joint
6. Intramuscular
   F. Pertaining to under the dermis
7. Luer-Lok
   G. Disposable prefilled cartridge of medication that slips into a nondisposable injection device
8. Primary drug
   H. Unit used for the calibration of syringes (no longer used in charting because cc is considered a dangerous abbreviation; mL is used in its place)
9. Secondary drug
   I. Medication fluid that leaks from the cannula or from the vein into the tissues surrounding the site
10. Subcutaneous
    J. Pertaining to within the skin

CHAPTER REVIEW
Assignment 34-4: Short Answer

1. List five separate routes used for delivering parenteral medications.

2. List four common parenteral routes by injection and mark those that are routinely performed by the medical assistant with an X.

   Perform by Medical Assistant

   A. 
   B. 
   C. 
   D. 

3. Describe factors that help determine the size of the syringe, length of needle, and the gauge of needle to be used.

   A. 
   B. 
   C. 

4. List several complications that may occur when administering IV therapy.

5. Explain why Z-track injections are not massaged after injection.

6. What protocol should be followed when upon aspiration there is blood in the syringe?

7. The purpose of forcing air into the vial is to equalize the pressure within the vial after the medication has been removed.
   A. What happens if the proper amount of air is not inserted?

   B. What happens when too much air is inserted?

8. What two vaccines should not be given to pregnant patients?

Assignment 34-5: Matching II
Match the type of injection to the description. Answers may be used more than once.

___ 1. Deltoid, gluteus, ventrogluteal, dorsogluteal, vastus lateralis  A. Intradermal injection
___ 2. 10- to 15-degree angle  B. Subcutaneous injection
___ 3. TB testing  C. Intramuscular injection
___ 4. 23–25 G  D. Intravenous injection
___ 5. Upper, fleshy part of arm
___ 6. No more than 1.0 mL
___ 7. Normally 20–23 G (may use larger gauge for really viscid medications)
___ 8. 20–21 G
___ 9. 45- to 90-degree angle
___ 10. Thicker medications
___ 11. 26–27 G
___ 12. No aspiration
___ 13. ½- to ¾-inch
___ 14. 90 degree
___ 15. ¾- to 5⁄8-inch
___ 16. No more than 3 mL
Assignment 34-6: True or False

Fill in the blank with a “T” for true statements and an “F” for false statements. Rewrite the false statements to make them true.

___ 1. The larger the gauge, the smaller the diameter of the needle.  

___ 2. IM injections will require a longer needle than subcutaneous or intradermal injections because muscles are deeper.

___ 3. Unit is the amount of a substance necessary to stimulate a systematic effect.

___ 4. The stopper of the vial must be cleansed with alcohol each time medication is withdrawn.

___ 5. When giving an intradermal injection, one should aspirate.

___ 6. When administering a subcutaneous injection, one should hold the skin taut.

Assignment 34-7: Certification Practice

Choose the best answer and place the corresponding letter in the blank.

___ 1. What type of diluent is typically used to reconstitute powders?
   A. Sterile peroxide
   B. Sterile alcohol
   C. Sterile saline
   D. Sterile chloride

___ 2. All of the following are types of medication that are single-dose and available in prefilled cartridges except:
   A. Penicillin G.
   B. Phenergan.
   C. DepoProvera.
   D. Albuterol.

___ 3. At what angle should an intradermal injection be given?
   A. 5-degree
   B. 10- to 15-degree
   C. 45-degree
   D. 90-degree
Part 1 • Chapter Assignment Sheets

4. At what angle should an intramuscular injection be given?
   A. 5-degree
   B. 10- to 15-degree
   C. 45-degree
   D. 90-degree

5. At what angle should a subcutaneous injection be given?
   A. 5-degree
   B. 10- to 15-degree
   C. 90-degree
   D. None apply

6. At what angle should an IV be started at?
   A. 25-degree
   B. 10- to 15-degree
   C. 45-degree
   D. 90-degree

7. All of the following would be sites for subcutaneous injection except:
   A. inner forearm.
   B. upper arm.
   C. lower abdomen.
   D. thigh region.

8. What nerve should be avoided when administering IM injection into the dorsogluteal site?
   A. Ulnar
   B. Sciatic
   C. Femoral
   D. Popliteal

9. All of the following would be common medications given subcutaneously except:
   A. MMR.
   B. insulin injections.
   C. allergy injections.
   D. allergy extracts for testing.

10. Which of the following routes would you use for allergy testing?
    A. Intradermal
    B. Subcutaneous
    C. IM
    D. Z-track

11. Which of the following routes would you use if the medication may cause irritation or discoloration to superficial layers of tissue or to the skin?
    A. Intradermal
    B. Subcutaneous
    C. IM
    D. Z-track

12. Which of the following routes is used for most vaccinations?
    A. Intradermal
    B. Subcutaneous
    C. IM
    D. Z-track
13. Which of the following routes is used for hormone injections?
   A. Intradermal
   B. Subcutaneous
   C. IM
   D. Z-track

14. Which of the following routes should be used for the MMR vaccine?
   A. Intradermal
   B. Subcutaneous
   C. IM
   D. Z-track

15. Which of the following routes should be used for TB testing?
   A. Intradermal
   B. Subcutaneous
   C. IM
   D. Z-track

16. Which of the following are benefits of IV therapy?
   A. Hydration
   B. Homeostasis
   C. Fast results
   D. All of the above

17. The term phlebitis means:
   A. blood clot.
   B. blood bruise.
   C. vessel collapse.
   D. inflammation of a vein.

18. The most common joint for intra-articular injections would be the:
   A. shoulder.
   B. knee.
   C. elbow.
   D. hip.

19. Which of the following types of IV solution is typically used for a patient who needs to be rehydrated?
   A. 5% Dextrose in water
   B. Normal saline
   C. Dextrose in saline solution
   D. Ringer's Solution

20. All of the following statements are true about intramuscular injections except:
   A. insert at a 45-degree angle.
   B. use the deltoid, gluteal, and vastus lateralis muscles.
   C. aspirate to ensure the needle is not in a blood vessel.
   D. use a 20–23 G and 1- to 3-inch needle (a larger gauge may be necessary for really viscid medications).

21. All of the following statements are true about subcutaneous injections except:
   A. use for allergy injections, some immunizations, and insulin.
   B. inject in the fatty portion of the upper arm, thigh, or abdominal area.
   C. use no more than 3.0 cc.
   D. insert at a 45- to 90-degree angle.
21. Which of the following is the maximum dose that you can administer for intramuscular injections?
   A. 0.5 mL
   B. 2.0 mL
   C. 3.0 mL
   D. 4.0 mL

22. The length of the needle is determined by the:
   A. route of administration and amount of adipose tissue.
   B. amount of medication to be delivered.
   C. viscosity of the medication.
   D. all of the above.

23. The needle’s gauge is determined by the:
   A. size of the patient’s muscle/amount of fat.
   B. amount of medication to be delivered.
   C. viscosity of the medication.
   D. all of the above.

24. Syringe size is determined by the:
   A. size of the patient’s muscle/amount of fat.
   B. amount of medication to be delivered.
   C. viscosity of the medication.
   D. all of the above.

25. Routine medications that are administered in the deltoid are:
   A. medications less than 1.0 cc.
   B. medications that are aqueous-based.
   C. routine immunizations.
   D. all of the above.

26. Routine medications that are administered using the subcutaneous route include all but which of the following?
   A. Allergy shots
   B. Hepatitis B and flu vaccines
   C. Insulin shots
   D. MMR, IPV and VA vaccines

27. All of the following statements are true about intravenous injections except:
   A. the medical assistant may prepare medications to be given.
   B. use a needle gauge of 20–21 G.
   C. state laws may vary as to who may administer intravenous medications.
   D. it provides the slowest absorption of all parenteral routes.
SKILLS APPLICATION CHALLENGES
Assignment 34-7: Labeling

1. Label the parts of this syringe.

   ![Diagram of syringe with labeled parts]

   1. 
   2. 
   3. 
   4. 
   5. 
   6. 
   7. 
   8. 
   9. 
   10. 

2. Label the angles of injections and list the type of injection that matches each angle (i.e., intradermal, subcutaneous, IM) in these pictures.

   ![Diagram of angles A, B, C, D]

   A. 
   B. 
   C. 
   D. 

Assignment 34-8: Syringe Review

Illustrate the amount of medication that should be drawn up in each syringe by coloring the amount of medication requested with a colored pencil, marker, or crayon.

A. 2.4 mL

B. 16 U

C. 0.5 mL

D. 3.2 mL

COMPLETING SPECIAL FORMS

Assignment 34-9: Immunization Activity

Work Forms Necessary: FORMS 34-1, 34-2, 34-3, 34-4

Directions: This assignment has two parts. First, role play with another student to simulate preparing a patient to receive an immunization. Second, document the immunization in the patient’s progress note and the immunization log. (Note: You wouldn’t ordinarily need to document manufacturer, lot number, and expiration info on both the progress note and log, but for practice purposes, document this information on both forms.)

A. With one of your fellow students, role play as medical assistant and patient using Work Form 34-1 (a VIS form). The patient’s name is Lori Wise. Once you have finished going over the form with the patient, have the patient sign the consent form (Work Form 34-2). Use 07/18/11 as today’s date. Sign your name as the witness, followed by SMA. Now, go to the CDC Web site and print the most recent version of the flu VIS form. (Go to www.cdc.gov and search for “Vaccine Information Statement.”) Give this form, along with Work Form 34-2, to your instructor when you turn in this workbook assignment.

B. Using the information below, document that you gave the patient a flu vaccine on the progress note (Work Form 34-3) and in the vaccination log (Work Form 34-4).

- Today’s date: 07/18/11
- Time: 10:55 a.m.
- Patient’s name: Lori Wise
- Amount given: 0.5 mL
- Location: Right deltoid
- Route: IM
- Ordering provider: Dr. Pella
• Manufacturer's name: Glaxo-Smith
• Lot number: 39838
• Expiration date: 02/12
• Medical assistant: Your Name
• Postinjection observation: No reactions
• Vaccination consent form signed and patient signed a consent form

FIELD APPLICATION CHALLENGE
Assignment 34-9

Read the following Field Application Challenge and respond to the questions following the scenario.

You work for a busy family practice and are in charge of ordering all of the medications. Unlike most medications, flu vaccine has to be ordered early in the year (usually during the months of February and March). If you forget to order the vaccine during those months, when flu shot season rolls around (in October and November) the office may be unable to obtain the vaccine, leaving patients scrambling to find other places to get their vaccines.

1. Based on this scenario, what can you do to make certain that this same scenario doesn’t occur in your office?

2. Flu vaccines are water-soluble and the amount that is given to each patient is 0.5 mL. These vaccines are to be given intramuscularly. What site would be best for adults? For children under the age of 5?

3. When giving an injection in the deltoid, which arm is the best arm to use and why?

4. What population of people seen in your office will receive the majority of flu vaccine?

5. Based on the location of the injection, the viscosity of the medication, and the population of patients receiving the vaccine, what gauges and lengths of needles should you have on hand during flu vaccine season?

6. If there is a shortage of the flu vaccine, which patients should receive the vaccine before others?
7. Why is it important to document vaccines into a medication log?

8. Explain why it is important to ask patients about drug allergies each time they come into your office?

9. What other allergies should you inquire about from patients receiving flu shots? (Hint: This information can be found in a Field Smart box in Chapter 32.)

**JOURNALING EXERCISE**

**Assignment 34-10**

What content within this chapter was most meaningful to you? Why? List some examples of how you might apply information contained in this chapter, both during your training and after you enter the health care industry.
INFLUENZAVACCINE
INACTIVATED
WHAT YOU NEED TO KNOW

1 Why get vaccinated?
Influenza (“flu”) is a contagious disease.
It is caused by the influenza virus, which spreads from infected persons to the nose or throat of others.
Other illnesses can have the same symptoms and are often mistaken for influenza. But only an illness caused by the influenza virus is really influenza.
Anyone can get influenza, but rates of infection are highest among children. For most people, it lasts only a few days. It can cause:
• fever
• sore throat
• chills
• fatigue
• cough
• headache
• muscle aches
Some people get much sicker. Influenza can lead to pneumonia and can be dangerous for people with heart or breathing conditions. It can cause high fever and seizures in children. On average, 226,000 people are hospitalized every year because of influenza and 36,000 die – mostly elderly.
Influenza vaccine can prevent influenza.

2 Inactivated Influenza vaccine
There are two types of influenza vaccine:
Inactivated (killed) vaccine, or the “flu shot” is given by injection into the muscle.
Live, attenuated (weakened) influenza vaccine, called LAIV, is sprayed into the nostrils. This vaccine is described in a separate Vaccine Information Statement.
For most people influenza vaccine prevents serious influenza-related illness. But it will not prevent “influenza-like” illnesses caused by other viruses.
Influenza viruses are always changing. Because of this, influenza vaccines are updated every year, and an annual vaccination is recommended. Protection lasts up to a year.
It takes up to 2 weeks for protection to develop after the vaccination.
Some inactivated influenza vaccine contains thimerosal, a preservative that contains mercury. Some people believe thimerosal may be related to developmental problems in children. In 2004 the Institute of Medicine published a report concluding that, based on scientific studies, there is no evidence of such a relationship. If you are concerned about thimerosal, ask your doctor about thimerosal-free influenza vaccine.

3 Who should get inactivated influenza vaccine?
People 6 months of age and older can receive inactivated influenza vaccine. It is recommended for anyone who is at risk of complications from influenza or more likely to require medical care:
• All children from 6 months up to 5 years of age.
• Anyone 50 years of age or older.
• Anyone 6 months to 18 years of age on long-term aspirin treatment (they could develop Reye Syndrome if they get influenza).
• Women who will be pregnant during influenza season.
• Anyone with long-term health problems with:
  - heart disease
  - kidney disease
  - lung disease
  - metabolic disease, such as diabetes
  - asthma
  - anemia, and other blood disorders
• Anyone with a weakened immune system due to:
  - HIV/AIDS or other diseases affecting the immune system
  - long-term treatment with drugs such as steroids
  - cancer treatment with x-rays or drugs
• Anyone with certain muscle or nerve disorders (such as seizure disorders or severe cerebral palsy) that can lead to breathing or swallowing problems.
• Residents of nursing homes and other chronic-care facilities.
Influenza vaccine is also recommended for anyone who lives with or cares for people at high risk for influenza-related complications:
• Health care providers.
• Household contacts and caregivers of children from birth up to 5 years of age.
• Household contacts and caregivers of people 50 years and older, and those with medical conditions that put them at higher risk for severe complications from influenza.
A yearly influenza vaccination should be considered for:
• People who provide essential community services.
• People living in dormitories or under other crowded conditions, to prevent outbreaks.
• People at high risk of influenza complications who travel to the Southern hemisphere between April and September, or to the tropics or in organized tourist groups at any time.
Influenza vaccine is also recommended for anyone who wants to reduce the likelihood of becoming ill with influenza or spreading influenza to others.

(Continues)
Work Form 34-1 (Continued)

4 When should I get influenza vaccine?

Plan to get influenza vaccine in October or November if you can. But getting vaccinated in December, or even later, will still be beneficial in most years. You can get the vaccine as soon as it is available, and for as long as illness is occurring. Influenza illness can occur any time from November through May. Most cases usually occur in January or February.

Most people need one dose of influenza vaccine each year. Children younger than 9 years of age getting influenza vaccine for the first time should get 2 doses. For inactivated vaccine, these doses should be given at least 4 weeks apart.

Influenza vaccine may be given at the same time as other vaccines, including pneumococcal vaccine.

5 Some people should talk with a doctor before getting influenza vaccine

Some people should not get inactivated influenza vaccine or should wait before getting it.

- Tell your doctor if you have any severe (life-threatening) allergies. Allergic reactions to influenza vaccine are rare. Influenza vaccine virus is grown in eggs. People with a severe egg allergy should not get the vaccine. A severe allergy to any vaccine component is also a reason to not get the vaccine.
- If you have had a severe reaction after a previous dose of influenza vaccine, tell your doctor.

- Tell your doctor if you ever had Guillain-Barré Syndrome (a severe paralytic illness, also called GBS). You may be able to get the vaccine, but your doctor should help you make the decision.
- People who are moderately or severely ill should usually wait until they recover before getting flu vaccine. If you are ill, talk to your doctor or nurse about whether to reschedule the vaccination. People with a mild illness can usually get the vaccine.

6 What are the risks from inactivated influenza vaccine?

A vaccine, like any medicine, could possibly cause serious problems, such as severe allergic reactions. The risk of a vaccine causing serious harm, or death, is extremely small. Serious problems from influenza vaccine are very rare. The viruses in inactivated influenza vaccine have been killed, so you cannot get influenza from the vaccine.

Mild problems:
- soreness, redness, or swelling where the shot was given
- fever • aches

If these problems occur, they usually begin soon after the shot and last 1-2 days.

Severe problems:
- Life-threatening allergic reactions from vaccines are very rare. If they do occur, it is usually within a few minutes to a few hours after the shot.
- In 1976, a certain type of influenza (swine flu) vaccine was associated with Guillain-Barré Syndrome (GBS). Since then, flu vaccines have not been clearly linked to GBS. However, if there is a risk of GBS from current flu vaccines, it would be no more than 1 or 2 cases per million people vaccinated. This is much lower than the risk of severe influenza, which can be prevented by vaccination.

7 What if there is a severe reaction?

What should I look for?
Any unusual condition, such as a high fever or behavior changes. Signs of a serious allergic reaction can include difficulty breathing, hoarseness or wheezing, hives, paleness, weakness, a fast heart beat or dizziness.

What should I do?
Call a doctor, or get the person to a doctor right away.

- Tell your doctor what happened, the date and time it happened, and when the vaccination was given.
- Ask your doctor, nurse, or health department to report the reaction by filing a Vaccine Adverse Event Reporting System (VAERS) form.
- You can file this report through the VAERS web site at www.vaers.hhs.gov, or by calling 1-800-822-7967.
- VAERS does not provide medical advice.

8 The National Vaccine Injury Compensation Program

In the event that you or your child has a serious reaction to a vaccine, a federal program has been created to help pay for the care of those who have been harmed.

For details about the National Vaccine Injury Compensation Program, call 1-800-338-2382 or visit their website at www.hrsa.gov/vaccinecompensation.

9 How can I learn more?

- Ask your immunization provider. They can give you the vaccine package insert or suggest other sources of information.
- Call your local or state health department.
- Contact the Centers for Disease Control and Prevention (CDC):
  - Call 1-800-232-4636 (1-800-CDC-INFO)
  - Visit CDC’s website at www.cdc.gov/flu

Vaccine Information Statement
Inactivated Influenza Vaccine (7/16/07) 42 U.S.C. §300aa-26
DOUGLASVILLE MEDICINE ASSOCIATES
5076 BRAND BLVD
DOUGLASVILLE, NY 01234
(123) 456-7890

IMMUNIZATION CONSENT FORM

I have read the Vaccination Information Statements(s) regarding the following immunizations listed below and am aware of the adverse reactions associated with the vaccine(s). I have had an opportunity to ask questions regarding the possible adverse reactions and benefits of each immunization. I believe that the benefits outweigh the risks and I assume full responsibility for any reactions that may occur.

1. ________________________________  2. ________________________________
3. ________________________________  4. ________________________________

I am requesting that the immunization(s) be given to me or the person listed below for whom I am the legal guardian.

______________________________  ________________________________
Signature/Legal Guardian          Today’s Date

______________________________  ________________________________
Print Name                      Witness
### Work Form 34-3

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Work Form 34-4

DOUGLASVILLE MEDICINE ASSOCIATES  
5076 BRAND BLVD  
DOUGLASVILLE, NY 01234  
(123) 456-7890

<table>
<thead>
<tr>
<th>Today's Date</th>
<th>Patient's Name</th>
<th>Ordering Physician</th>
<th>Amt Given</th>
<th>Manufacturer's Name</th>
<th>Lot Number</th>
<th>Exp. Date</th>
<th>MA</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>07/18/2011</td>
<td>Gunter, Thomas</td>
<td>Little</td>
<td>0.5 mL</td>
<td>Glaxo-Smith</td>
<td>39838</td>
<td>02/2012</td>
<td>NS</td>
<td>10:45 am</td>
</tr>
</tbody>
</table>

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>