



Wolters Kluwer

When you have to be right

Introduction to Clinical Pharmacology

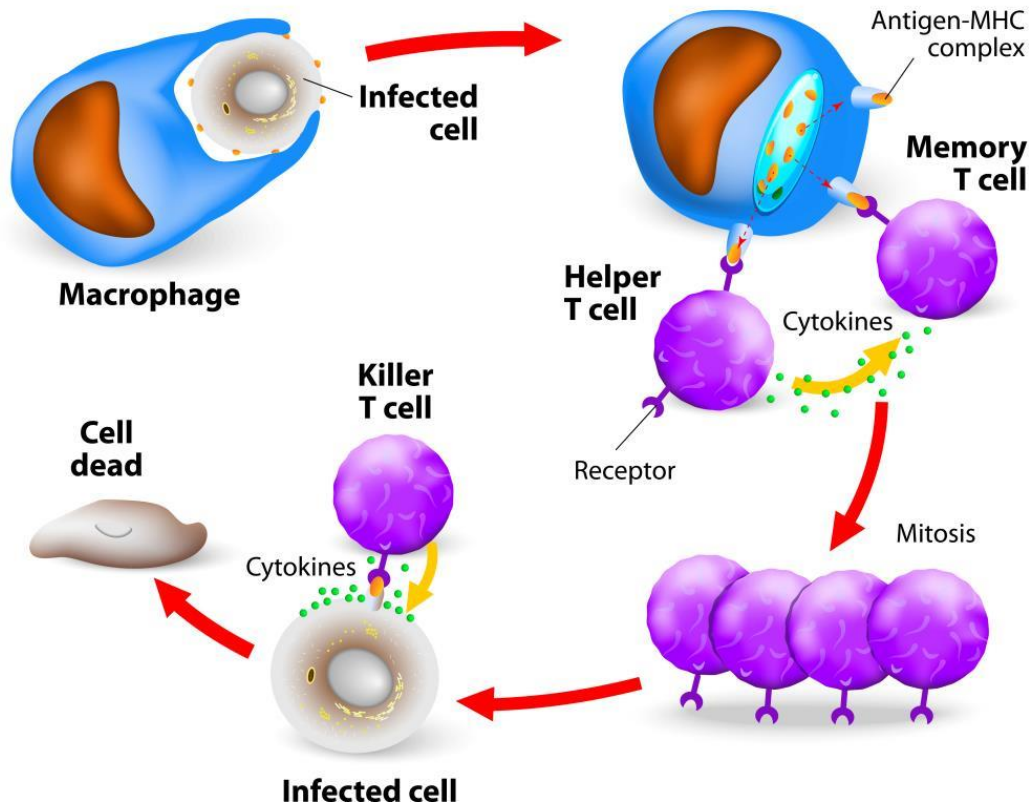
Chapter 49 Immune Blockers

Learning Objectives

1. List the classes of immune blockers used in the immunosuppressive treatment of diseases.
2. Explain the uses, general drug actions, general adverse reactions, contraindications, precautions, and interactions of the immune blocker drugs.
3. Distinguish important preadministration and ongoing assessment activities the nurse should perform with the client receiving immune blocker drugs.
4. List nursing diagnoses particular to a client receiving immunotherapy drugs.
5. Examine ways to promote an optimal response to therapy, how to manage common adverse reactions, and important points to keep in mind when educating clients about the use of an immune blocker drug.

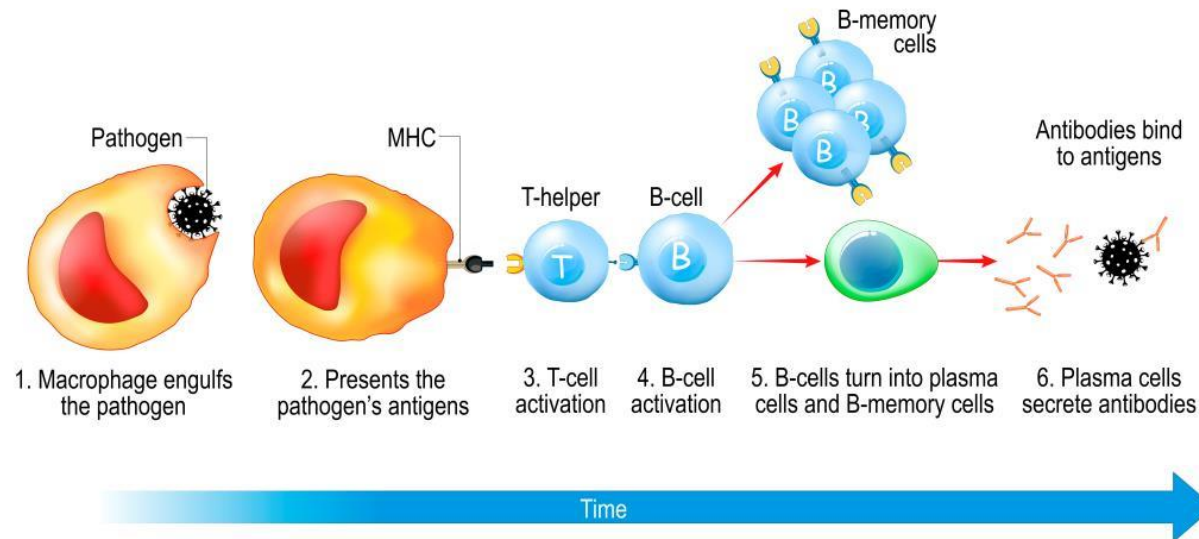
Cell-Mediated Immunity

CELL-MEDIATED IMMUNE RESPONSE



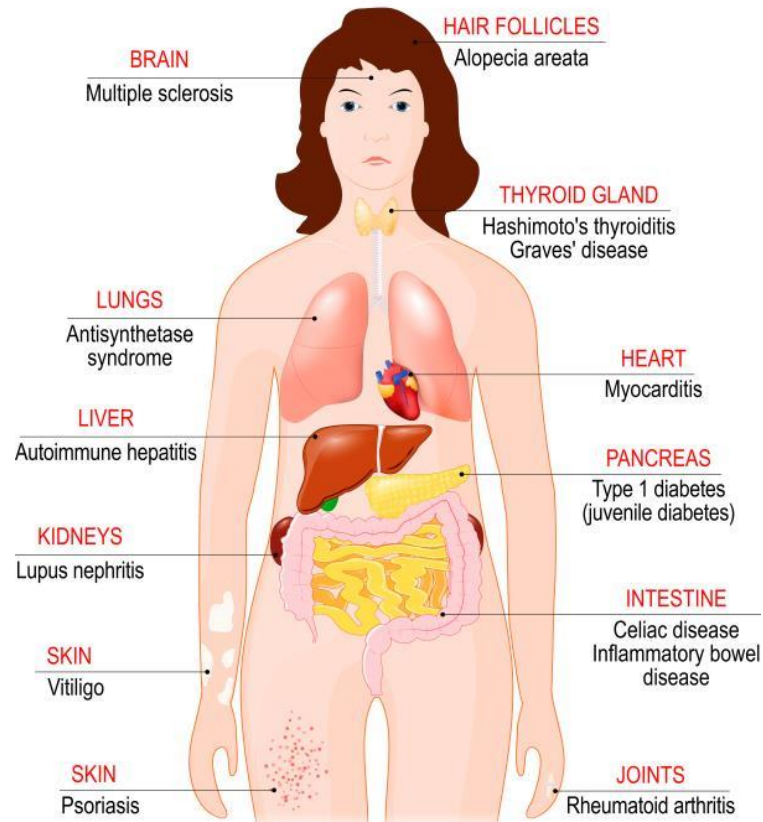
Humoral Immunity

Immune response humoral immunity



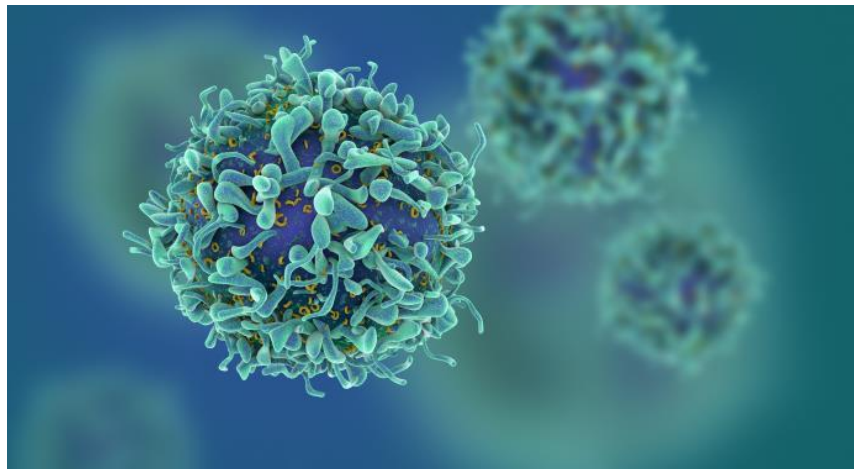
Autoimmune Conditions

Tissues of the body affected by **AUTOIMMUNE ATTACK**



Immunosuppressant Drugs—Actions

- Actions: weaken the immune system by:
 - Inhibiting the inflammatory response
 - Inhibiting the activation of T cells
 - Reduce antibody formation



Immunosuppressant Drugs

- Corticosteroids (prednisone)—prevent production of cytokines and interleukins so lymphocytes do not respond
- Calcineurin inhibitors (tacrolimus or cyclosporine)—bind with calcineurin (protein that activates T cells) and prevent the secretion of IL-2 (interleukin)
- MTOR-inhibitors (sirolimus)—prevent cell cycle completion of the lymphocyte cells

Immunosuppressant Drugs (continued)

- IMDH inhibitors (azathioprine or mycophenolate)—antimetabolite, which inhibits enzymes and impairs B and T cell lymphocyte production
- Biologics (etanercept)—lysis of lymphocytes
- Monoclonal antibodies (basiliximab)—prevent activation of T lymphocytes

Immunosuppressant Drugs—Actions and Uses

- Used to treat autoimmune disorders such as:
 - psoriasis
 - multiple sclerosis
 - Crohn disease
 - ulcerative colitis
 - rheumatoid arthritis
- Also used to prevent organ rejection in clients with an organ transplant

Pharmacology in Practice Exercise #1

Immunosuppressives are used to dampen the cellular response to which cell line?

- a) Erythrocytes
- b) Lymphocytes
- c) Megakaryocytes
- d) Plasma Cells



Immunosuppressant Drugs—Adverse Reactions #1

- Most Common Adverse Reactions:
 - Headache
 - Chills
 - Fever
 - Nausea or GI distress (monoclonal antibodies)



Immunosuppressant Drugs—Adverse Reactions #2

- Other General Adverse Reactions:
 - Itching
 - Dizziness
 - Myalgias
 - Gum hyperplasia, hair growth or tremors (calcineurin inhibitors)



Immunosuppressant Drugs—Contraindications and Precautions

- Contraindications:
 - Live virus vaccines should not be given to clients on an immunosuppressant drug
 - HIV (alefacept)
- Precautions:
 - Clients taking calcineurin inhibitors should be monitored for nephrotoxicity (BUN monitored frequently)

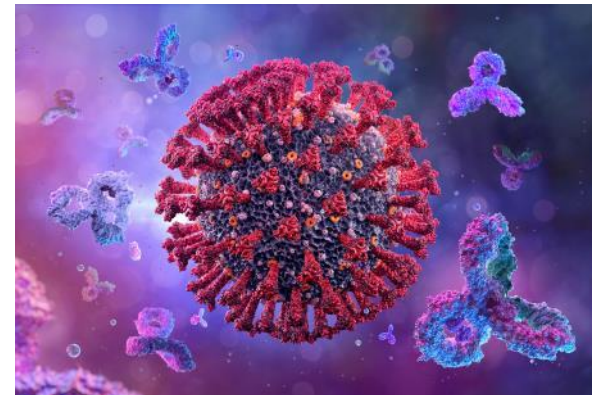


Immunosuppressant Drugs—Interactions

Interacting Drug/Food	Common Use	Effect of Interaction
Calcineurin Inhibitors		
Antiarrhythmic drugs	Treat cardiac arrhythmias	Cardiac arrhythmias are more likely to occur
IMDH Inhibitors		
ACEI	To treat hypertension	Severe reduction in red cells, white cells, and platelets
Many Immunosuppressant Agents		
Grapefruit juice or other citrus	Part of nutrition/diet	Consult a clinical nutritionist for client instructions on dietary restrictions

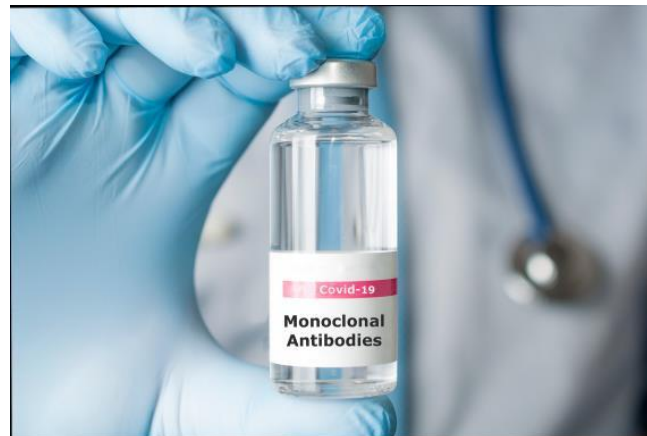
Monoclonal Antibodies (mAbs)—Actions and Uses

- Action: target specific antigens on the surface of the cell to reduce an immune response
- Uses
 - Reduce inflammation and promote clinical remission in clients with ulcerative colitis, skin conditions, and rheumatoid arthritis
 - Targeting the allergy cascade in clients with severe asthma



Monoclonal Antibodies (mAbs)—Uses (continued)

- Uses:
 - Neutralizing key immune elements that attack the nervous system in clients with multiple sclerosis
 - Preventing migraine attacks
 - Preventing new vessel formation in the eyes of clients with wet macular degeneration
 - Adjunct therapy in fighting viral diseases (e.g., HIV and COVID-19)



Monoclonal Antibodies—Adverse Reactions #1

- Central Nervous System Reactions:
 - Headache
 - Dizziness



Monoclonal Antibodies—Adverse Reactions #2

- Gastrointestinal System Reactions:
 - Nausea
 - Abdominal pain



Nausea

Monoclonal Antibodies—Adverse Reactions #3

- Immune System Reactions:
 - Infection
 - Skin eruptions
 - URI with cough
 - Antibody development

COUGHING



Monoclonal Antibodies—Adverse Reactions #4

- Infusion Reactions:
 - Hypersensitivity can occur when an mAbs are delivered IV or subcutaneous injection
 - More likely to occur in an mAb that contains more mouse tissue; mAbs ending in *-momab* contain mouse tissue
 - Occur most often during the first infusion
 - Some signs of infusion reaction are:
 - fever, chills, rigors, sweating, warm feeling, chest pain, metallic taste, nausea, vomiting, cough, and respiratory distress

Monoclonal Antibodies—Contraindications

- Contraindications:
 - Active severe infection
 - No live vaccine before, during, or immediately after mAbs
 - Pregnancy
 - Lactation during therapy and 6 months after therapy



Monoclonal Antibodies—Precautions

- Precautions:
 - Underlying viral infections like hepatitis B may be reactivated
 - Cardiac and renal impairment
 - Women of childbearing age must use birth control



Monoclonal Antibodies—Interactions

Interacting Drug/Food	Common Use	Effect of Interaction
Clozapine, promazine	Management of psychiatric problems	Increased risk for CNS toxicity
Roflumilast	Treatment of respiratory problems	Increased risk for immunosuppression
Vaccines (BCG, COVID-19, Rabies)	Prevent viral disease	Decreased development of immunity to specified pathogen

Biosimilars

- Biologics are produced using technology and living tissue from a type of cell; original patent product
- Biosimilar is like the original biologic, but some of the inactive portions may be different
- Naming biologics and biosimilars:
 - Biologic example: infliximab
 - Biosimilar example: infliximab-dyyb



Nursing Process—Client Receiving a Monoclonal Antibody Drug #1

Preadministration Assessment

- **Objective Data**
 - Note type and location of disease
 - Vital signs
 - Weight
 - Inspect general physical appearance, noting skin for baseline integumentary status



Nursing Process—Client Receiving a Monoclonal Antibody Drug #2

Preadministration Assessment

- **Objective Data (continued)**
 - Neurological and psychological assessment to monitor for reactions
 - Lab tests: ECG, CBC, lipid profile, diabetes screening, baseline organ function (e.g., liver and thyroid) autoimmune status, and pregnancy test



Nursing Process—Client Receiving a Monoclonal Antibody Drug #3

Preadministration Assessment

- Subjective Data
 - Client's knowledge or understanding of the proposed immunotherapy regimen
 - Previous or concurrent treatments (if any) and toleration of treatments
 - History of other current diseases or disorders (e.g., diabetes, malignant disease)



Nursing Process—Client Receiving a Monoclonal Antibody Drug #4

Preadministration Assessment

- **Subjective Data (continued)**
 - History of travel to areas where infectious diseases are prevalent
 - History of having had an infectious disease
 - Other factors: client's age, financial problems associated with long-term illness, family knowledge and assistance with care, adequacy of health insurance coverage



Nursing Process—Client Receiving a Monoclonal Antibody Drug #5

Ongoing Assessment

- Monitor for flu-like systems
- Monitor clients with preexisting lung cancer closely for inflammatory reactions in the respiratory system
- Monitor for opportunistic infections



Nursing Process—Client Receiving a Monoclonal Antibody Drug #6

Nursing Diagnosis

- Impaired Comfort: Flu-like symptoms related to stimulation of the immune system
- Altered Skin Integrity related to integumentary response to generalized inflammatory process

Nursing Process—Client Receiving a Monoclonal Antibody Drug #7

Planning

- Expected client outcomes depend on the reason for administration of the drug but include:
 - Optimal response to therapy
 - Management of adverse drug reactions
 - Confidence in an understanding of the prescribed medication regimen

Nursing Process—Client Receiving a Monoclonal Antibody Drug #8

Implementation

- Promoting Optimal Response to Therapy
 - Only nurses who are certified in immunotherapy may administer these drugs
 - Any nurse may monitor clients receiving a monoclonal antibody drug for adverse reactions



Nursing Process—Client Receiving a Monoclonal Antibody Drug #9

Implementation

- *Promoting Optimal Response to Therapy—Monoclonal Antibodies*
 - Give IV mAbs slowly over time or premedicate with acetaminophen, diphenhydramine and/or a steroid to reduce chance of hypersensitivity reactions
 - If reaction occurs, stop the infusion and administer IV steroids and/or diphenhydramine
 - Inform client that reactions decrease with ongoing therapy
 - Provide clients with warm blankets for comfort during IV administration

Nursing Process—Client Receiving a Monoclonal Antibody Drug #10

Implementation

- *Promoting Optimal Response to Therapy—Monoclonal Antibodies*
 - Provide client teaching on subcutaneous injection technique for clients who are prescribed self-administration of a subcutaneous mAb.
 - Evaluate the client's knowledge of proper storage, administration technique, potential site reactions, and disposal
 - Oral mAbs should be taken at the same time every day; food may exacerbate the skin rash of erlotinib if taken with food

Nursing Process—Client Receiving a Monoclonal Antibody Drug #11

Implementation

- Monitoring and Managing Client Needs
 - **Impaired Comfort**
 - Offer client with gastric upset, cold and salty foods
 - Provide warm blankets and warm fluids to drink during the infusion
 - Encourage client to exercise to reduce fatigue and balance activity with rest periods



Nursing Process—Client Receiving a Monoclonal Antibody Drug #12

Implementation

- Monitoring and Managing Client Needs
 - **Altered Skin Integrity**
 - For clients on mAbs that develop a skin inflammatory response:
 - Do not use acne-type products on the rash
 - Have client avoid direct sunlight and wear sunscreen
 - Encourage client not to itch or rub the area, and to wear comfortable clothing



Nursing Process—Client Receiving a Monoclonal Antibody Drug #13

Implementation

- Monitoring and Managing Client Needs
 - **Altered Skin Integrity (continued)**
 - For clients on mAbs that develop a skin inflammatory response:
 - Instruct client to use mild soaps and sensitive skin moisturizers to decrease itching; avoid harsh soaps and perfumed lotions
 - Avoid puncturing any pustules that form; monitor for bacterial infection



Nursing Process—Client Receiving a Monoclonal Antibody Drug #14

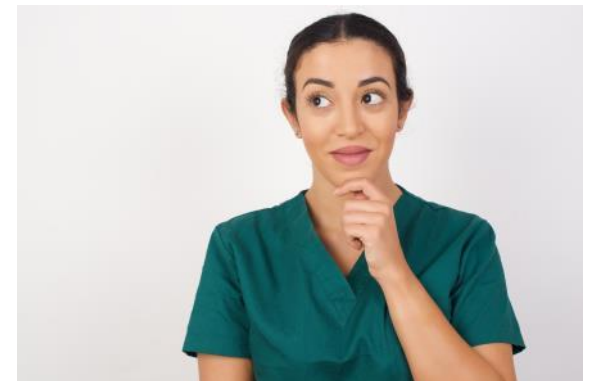
Implementation

- Monitoring and Managing Client Needs
 - **Potential Complication—Infusion Reactions**
 - Teach client the bacterial risk for infusion reaction is greater in the first couple of sessions
 - Reactions tend to be more pronounced when the mAb is produced from mouse tissue
 - -momab (highest risk of infusion reaction)
 - -ximab
 - -zumab
 - -mumab (lowest risk of infusion reaction)

Pharmacology in Practice Exercise #2

A client in the outpatient infusion clinic complains of feeling nauseated and chilly during their mAb infusion. Which of the following interventions should the nurse perform to provide comfort? Select all that apply.

- a) Reduce the infusion rate
- b) Select a carbonated beverage/ice from the client supplies
- c) Tell the client to avoid sun on clear and cloudy days
- d) Obtain a new blanket from the warmer and soda crackers



Nursing Process—Client Receiving a Monoclonal Antibody Drug #15

Implementation—Educating the Client and Family

- Review the provider's proposed treatment and potential adverse effects with the client and family
- Explain the importance of taking the drug at prescribed time intervals and as directed
- Explain the possible adverse effects and necessary interventions required
- Emphasize the importance of keeping all clinic appointments



Nursing Process—Client Receiving a Monoclonal Antibody Drug #16

Implementation—Educating the Client and Family

- Oral Administration of Immunotherapy Drugs in the Home Setting—**Teach the Client to:**
 - use a calendar, alarms or automated medication box to remember when to take the drug(s)
 - involve family members to help if the client is not feeling well
 - not use the immunotherapy drug vial if it is cloudy or contains flakes



Nursing Process—Client Receiving a Monoclonal Antibody Drug #17

Implementation—Educating the Client and Family

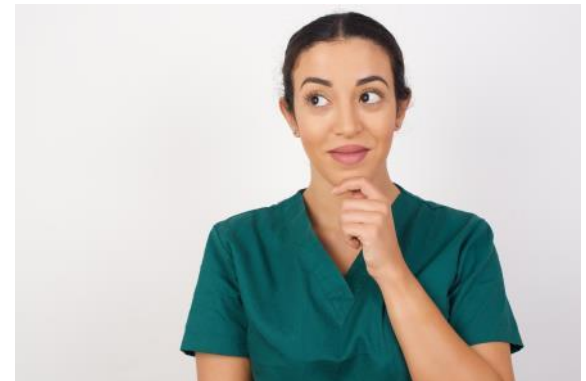
- **Oral Administration of Immunotherapy Drugs in the Home Setting—Teach the Client to (continued):**
 - avoid taking any nonprescription drugs or drinking alcohol unless provider approval
 - always inform healthcare providers and personnel about immunotherapy use
 - report any adverse reactions to the provider



Pharmacology in Practice Exercise #3

In your client teaching session, you are asked the best method to warm adalimumab for self-injection. Your best reply is _____.

- a) In the microwave
- b) Rolling the pen between your palms
- c) On the counter, safely away from children
- d) Running hot tap water on the pen



Nursing Process—Client Receiving a Monoclonal Antibody Drug #18

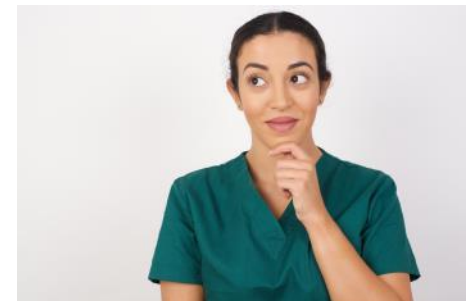
Evaluation

- Was the therapeutic effect achieved and is there reduced evidence of the disease?
- Were adverse reactions: identified, reported, and managed?
 - Client reports comfort with minimal fever or chills
 - Skin is intact and irritation is reduced
- Did client and family express confidence and demonstrate understanding of drug regimen?

Turn and Talk—Case Study #1

As the clinic nurse you are conducting an assessment on a client who is to start injections of adalimumab (Humira) for Rheumatoid Arthritis. This client provides childcare on occasion for grandchildren and notes the children were “sniffly and a bit cranky” yesterday when they were at the house. Intake vital signs are as follows: Temp, 38°C; pulse, 88; respirations, 20; and blood pressure, 132/78.

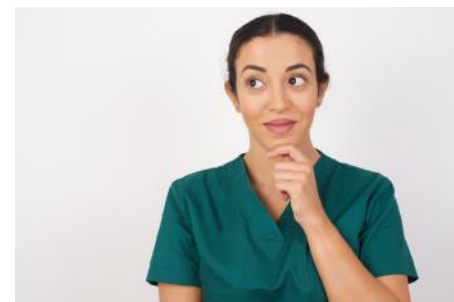
1. Should the physician be alerted to any of the assessment data gathered by the nurse?



Turn and Talk—Case Study #2

As the clinic nurse you are conducting an assessment on a client who is to start injections of adalimumab (Humira) for Rheumatoid Arthritis. This client provides childcare on occasion for grandchildren and notes the children were “sniffly and a bit cranky” yesterday when they were at the house. Intake vital signs are as follows: Temp, 38°C; pulse, 88; respirations, 20; and blood pressure, 132/78.

2. The client says they have a friend who is also getting a monoclonal antibody (mAb) for asthma, since they do not have trouble breathing, why is the physician prescribing this drug?



Turn and Talk—Case Study #3

As the clinic nurse you are conducting an assessment on a client who is to start injections of adalimumab (Humira) for Rheumatoid Arthritis. This client provides childcare on occasion for grandchildren and notes the children were “sniffly and a bit cranky” yesterday when they were at the house. Intake vital signs are as follows: Temp, 38°C; pulse, 88; respirations, 20; and blood pressure, 132/78.

3. The client is a bit sad that therapy is not starting today, are there instructions the nurse can provide for self-administration at home to make the client feel this is not a wasted visit to the clinic?

