

CRITICAL FACTS

The source and causes of abdominal pain can be difficult to pinpoint, and intensity of abdominal pain does not always reflect the seriousness of the condition.

immediate care to prevent shock, so they should always be treated seriously. A sudden onset of abdominal pain is called **acute abdomen**.

Causes

Abdominal pain can be difficult to pinpoint, as the pain may start from somewhere else and could be a result of any number of generalized infections including the flu or strep throat.

The intensity of the pain does not always reflect the seriousness of the condition. Severe abdominal pain can be from mild conditions, such as intestinal gas, whereas relatively mild pain or no pain may be present with life-threatening conditions such as early appendicitis.

Signs and Symptoms of Abdominal Pain

If you are called to see a patient who is experiencing abdominal pain, assume the pain is serious, as the patient or family members were concerned enough to seek emergency medical attention. Patients suffering from abdominal pain may show the following signs and symptoms:

- Colicky pain or cramps that come in waves
- Abdominal tenderness, local or diffuse (spread out)
- Guarded position
- Anxiety
- A reluctance to move, for fear of pain
- Loss of appetite
- Nausea or vomiting
- Fever
- Rigid, tense or distended stomach
- Signs of shock
- Vomiting blood with a red or brownish appearance
- Blood in the stool, appearing red or black
- Rapid pulse
- Blood pressure changes

When conducting an assessment, monitor the patient's movements. Take note if the patient is restless or quiet and if the patient feels pain when moving. Check to see if the abdomen is distended and, if possible, confirm with the patient whether



Fig. 14-8: When assessing abdominal pain in a patient, palpate the stomach to determine if it is rigid or soft.

the appearance of the stomach is normal. See if the patient is able to relax the abdomen, and palpate the stomach to determine if it is rigid or soft (**Fig. 14-8**). Examine the area the patient indicates as the location of the pain *last*. Do *not* overpalpate, as this can aggravate the condition as well as cause more pain.

Providing Care for Abdominal Pain

First, ensure the patient has an open airway. Call for transport to a medical facility. In the case of abdominal pain, it is important to watch for signs of potential aspiration due to vomiting. In cases in which the patient is experiencing nausea, place the patient on the side if it is not too painful. Do *not* give the patient food, water or medication. Watch for signs of shock. If vital signs and other observations indicate the patient is in shock, place the patient on the back, maintain normal body temperature and administer emergency oxygen if available.

Pediatric Considerations

Abdominal Pain

Abdominal pain in children can indicate a vast range of conditions. A sudden or progressive onset of pain, excessive vomiting or diarrhea, blood noted in vomit or stool, abdominal distention, high blood sugar, altered mental status and abnormal vital signs are all signs the child could be suffering from a serious condition or illness. Vomiting and diarrhea in children are significant symptoms as they may cause dehydration and shock.

To assess a child complaining of abdominal pain, take the following steps:

- Obtain a first impression of the child's appearance, breathing and circulation to determine urgency.
- Evaluate the child's mental status, airway, adequacy of breathing and circulation.
- Take the child's history and perform a hands-on physical examination noting any injury, hemorrhage, discoloration, distention, rigidity, guarding or tenderness within the four abdominal quadrants.
- If a life-threatening condition is noted, provide immediate treatment before continuing.

Children of different ages tend to have different causes of pain. Causes in an infant can include colic, allergy to cow's milk, reflux esophagitis, volvulus (bowel obstruction) or Hirschsprung's Disease (congenital disease affecting the large intestine). In school-age children, the most frequent cause of abdominal pain is gastroenteritis or "stomach flu," which may result in significant fluid loss. Also common is the ingestion of toxic substances or food poisoning.

In adolescents, growth, development and fertility issues can cause problems such as testicular torsion (twisting of the testicles), ovarian cysts, pelvic inflammatory disease, ectopic pregnancy (pregnancy that occurs outside the womb), inflammatory bowel disease, ulcerative colitis, Crohn's disease, DKA, pneumonia and sickle cell anemia.

Geriatric Considerations

Abdominal Pain

Understanding that elderly patients may experience vague symptoms and have non-specific findings on examination is important. Keep in mind that abdominal pain may actually be caused by a heart attack or other medical conditions. Many elderly patients may have much less severe pain than expected for a particular illness or disease, which can lead to elderly patients with serious conditions being misdiagnosed with less serious conditions such as gastroenteritis or constipation. Vomiting and diarrhea are significant symptoms in geriatric patients, as they can cause dehydration and shock.

Causes of abdominal pain in elderly patients may include biliary tract disease, appendicitis, diverticulitis, mesenteric

ischemia (reduced blood flow to the small intestines), bowel obstruction, abdominal aortic aneurysm, peptic ulcer disease, malignancy and gastroenteritis.

Common Abdominal Emergencies

Many different conditions can cause abdominal pain, including inflammation of the appendix (appendicitis), bowel obstruction, inflammation of the gallbladder, abdominal aortic aneurysm, diverticular disease, shingles, food allergies, food poisoning, gastroenteritis and others. Consider the situation an emergency when the abdominal pain restricts activity.

HEMODIALYSIS

People with advanced renal failure, or kidney failure, often need dialysis to filter waste products from the blood using a special filtering solution. There are two types of dialysis: **peritoneal dialysis**, which injects a solution through the abdominal wall and then withdraws it after a period of time, and **hemodialysis**, which uses a machine to clean waste products from the blood. Dialysis is often used on patients with renal disease while they are waiting for a kidney transplant.

Complications of dialysis include hypotension (abnormally low blood pressure), disequilibrium syndrome (a reduction of the blood urea level relative to the levels found in brain tissues), hemorrhage (abdominal, *gastrointestinal* [GI] and intracranial bleeding), introduction of an air embolus or other foreign body into the patient's circulatory system due to equipment malfunction, and complications caused by temporarily stopping a patient's medications during the dialysis process.

Special Considerations for Hemodialysis Patients

The following details should be considered when taking a history and physical exam with a patient who has renal failure:

- A comprehensive history should include information about past dialysis and complications; recent salt, potassium and fluid



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intake; information about the current dialysis session and the patient's dry weight and how much fluid was removed before the session was terminated.

- The general physical assessment should include fluid status, mental status, cardiac rhythm and **shunt** location.

Note: Shunts in the arm are common in long-term hemodialysis patients. If an active shunt is located in the patient's arm, *do not* take blood pressure using that arm. Old, nonfunctional shunts are not uncommon, and blood pressure can be taken on an arm with a nonfunctional shunt. Ask the patient about active and nonfunctional shunt locations when taking a history. Shunts can also be potential sites of infection and/or blockage.

- Pay attention for associated medical problems such as arrhythmias, internal bleeding, hypoglycemia, altered mental status and seizures.
- Be aware that, after dialysis, patients may have **hypovolemia** (reduced blood volume) and exhibit cold, clammy skin; poor skin turgor (elasticity); tachycardia; and hypotension. Delayed dialysis patients will have **hypervolemia** (increased blood volume) and may have abnormal lung sounds such as crackles, generalized edema, hypertension or jugular venous distension.
- Be alert for altered mental status.
- Be sure to assess cardiac rhythm.

Life-Threatening Emergencies Associated With Dialysis Patients

Patients on dialysis can experience several types of complications, for example uremia (accumulation of urinary waste products in

the blood), fluid overload (reduction in the body's ability to excrete fluid through urine), anemia (hemoglobin deficiency), hypertension, **hyperkalemia** (excess potassium in the blood) and coronary artery disease. Emergencies also can occur as complications of the dialysis itself, including hypotension, disequilibrium syndrome, hemorrhage, equipment malfunction (e.g. introducing an air embolus or other foreign body into the circulatory system) or complications from being temporarily removed from medications.

PUTTING IT ALL TOGETHER

As is true of all emergencies, a medical emergency can strike anyone, at any time. The signs and symptoms for each of the medical emergencies described in this chapter, such as changes in LOC, sweating, confusion, weakness and appearing ill, will indicate the necessary initial care you should provide.

In most cases involving a medical emergency, your biggest challenge is that you may not know the cause. In the case of a diabetic emergency, seizure, stroke and fainting, the causes may be easier to ascertain. However, you can provide proper care without knowing the exact cause, allowing the patient to remain as comfortable and safe as possible until arrival at a medical facility. You can also recognize the dangers and complications of dealing with those with diabetes or renal failure. And you have learned the importance of age considerations in many conditions, such as abdominal pain and seizure.

Performing a proper assessment and following the general guidelines of care for any emergency will help prevent the condition from becoming worse. While it is not your role to diagnose the problem, it is your job to provide initial care to the patient until a proper diagnosis can be made.



YOU ARE THE EMERGENCY MEDICAL RESPONDER

As you continue monitoring the patient, he becomes even more confused and agitated. You begin to notice signs of shock. As an EMR, what should you do while awaiting EMS personnel?

Enrichment

Basic Pharmacology

COMMON FORMS OF MEDICATION

Emergency medical responders (EMRs) are often called upon to help give or administer medications. These medications come in several types and forms, including tablets, capsules, powders, liquids, creams and aerosol sprays. They also have a range of options regarding how they are administered and the doses used in a given circumstance.

BASIC MEDICATION TERMINOLOGY

Drug Name

Upon initial discovery, a drug is given a chemical name based on its chemical properties. It is then given a generic, or non-proprietary name, usually a shorter version of the chemical name. This is the name used for the *Food and Drug Administration* (FDA) approval application. Drugs are also given a brand or trade name, which is used in marketing. It may or may not sound like the generic name, depending on the complexity of the generic name and the drug's purpose. For example, with a chemical name of N-acetyl-*p*-aminophenol, the generic name of this drug is acetaminophen and the trade name is Tylenol®.

Drug Profile

A drug's profile is a description of what it does, what it is or is not given for and any issues that may develop as a result of taking it.

- **Actions:** The action of a medication is what it does. If you are administering a drug, you should know how the drug works. For example, does the medication dilate the blood vessels (vasodilator) to lower blood pressure?
- **Indications:** The indication of a drug is the intended use for a specific condition. Why is the drug given? What are you trying to achieve? For example, the indication for nitroglycerin would be for chest pain or angina.
- **Contraindications:** Not everyone can take every medication. Contraindications are the conditions in which you would not administer a drug to a patient. This could be because the patient has a medical condition that would be worsened by administration of the drug, because of adverse interactions with other medications or because the patient may be allergic to the medication. For example, it would be contraindicated to give morphine to a patient who is allergic to it, or to give a medication with a known effect of hypotension (lowering blood pressure) to a patient whose blood pressure is already low.
- **Side effects:** Side effects are reactions caused by the drug that were not intended. Side effects may or may not cause problems. If they do cause problems, these are called adverse effects, adverse reactions or untoward effects. These are the effects you must watch for when administering medications such as nitroglycerin. Nitroglycerin works by dilating the blood vessels, but it can cause the sudden and possibly harmful side effect of lowering blood pressure.
- **Dose:** The usual dose is a range of an acceptable amount of the medication, given the patient's age, weight and reason for giving the drug. There are also times when the patient's gender must be taken into account. Administering an overdose, or too much of a drug, can result in severe, sometimes fatal, consequences. Administering too little of a drug may cause the problem to worsen, because the drug will not have the desired effect on the patient.
- **Route:** You must know by which route a drug is to be given. Some medications can be given in different ways; for example, by injection or intravenously. However, there is a significant difference in the dose given by each route. If a patient receives a dose intravenously that was intended to be delivered by injection, this could result in death.

Prescribing Information

Medication prescriptions must contain the following information:

- Pharmacy's name and address
- Prescription's serial number

- Date of the prescription (initial filling or refill date)
- Prescriber's name
- Patient's name
- Directions for use, including any precautions
- Medication name and strength
- Federal law inscription on transfer of drugs

Medication prescriptions also commonly contain the following additional information:

- Patient's address
- Pharmacist's initials or name
- Pharmacy's telephone number
- Manufacturer's lot number
- Drug's expiration date
- Manufacturer's or distributor's name
- Quantity of medication dispensed
- Number of refills remaining

Routes of Administration

Medications can be given in many ways, including the following:

- **By mouth:** Many medications, such as tablets, capsules, powders and liquids may be given by mouth to be absorbed by the stomach and intestines. The amount of time it takes for them to become effective can vary considerably. The patient must be responsive enough to follow directions to swallow and able to swallow.
- **Sublingually:** These medications dissolve under the tongue and are absorbed into the bloodstream through the mucous membrane.
- **By inhalation:** Some medications are inhaled (i.e., through mouth, nose or tracheotomy) directly into the lungs. These are usually medications for respiratory illnesses like asthma. Oxygen, which is inhaled, is also considered a medication.
- **By injection:** These medications are usually administered by a licensed health-care professional or by a caregiver. They can be given straight into the muscle or under the skin, depending on the product.
- **Topically:** Topical medications are given by patch or gel and absorbed by the skin. EMRs must be careful when encountering a patch on a patient's skin, as the medication could be absorbed by the responder when trying to remove the patch.
- **Intravenously:** Medications given intravenously must be administered by a licensed health-care professional. It is one of the quickest ways to deliver fluids and medications, as substances are directly transmitted to the veins.
- **Vaginally:** Some creams and suppositories must be given vaginally.
- **Rectally:** Many medications are available in rectal suppository format.

ADMINISTERING MEDICATIONS OVERVIEW

The “Rights” of Drug Administration

Health care personnel who administer medication follow a concept called the “Five Rights.” These help ensure the medication is being given correctly.

- **Right patient:** If administering a patient's own medication, you must ensure it truly is the patient's medication. Check the label for the correct name. An exception may be if medical direction calls for a medication that is available but does not belong to the patient. If you are administering a stock medication (one that is kept on hand until needed), you must understand the action and effects to be sure that it is right for this patient.
- **Right medication:** When reaching for a medication, read the label properly and ensure that the medication in the bottle is what the label says it is. If in doubt, do not give it. If you are reaching for a stock medication, read the label as you remove it from your stock, while you remove the medication from the container and again as you give it to the patient.

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Enrichment

Basic Pharmacology (continued)

- Right route: Be sure you are administering the drug as prescribed. You may find a prescription for a drug given by a route with which you are not familiar. When in doubt, double check.
- Right dose: Double check the dosage of the drugs you give to patients. Some medications vary considerably in dose between patients.
- Right date: Medications have expiration dates. This is the first day of the month listed, unless otherwise specified. Do not give expired drugs.

Administration of Versus Assistance with Medication

Administering a medication means you are physically giving the medication to the patient. In some situations, the patient is able to take medication alone, such as by a metered-dose inhaler (MDI) for a respiratory emergency (**Fig. 14-9, A–B**). In this case, you may assist by helping get the medication ready and perhaps holding the inhaler while the patient presses the pump. Always follow medical direction, regulations and local protocols regarding your role in assisting patients with medications.

Administration Routes

You may only administer medications by routes you have been licensed or authorized to administer. Generally, for EMRs, this is by inhalation, orally or sublingually (under the tongue). There may be regulatory exceptions regarding EMR use of auto-injectors for anaphylaxis and inhalers for asthma. Check local protocols and medical direction to know the medications that you can deliver.

Reassessment

After administering a drug, you must always assess the effect. You will need to watch for—

- Signs and symptoms of the original problem.
- Improvement or deterioration in the patient's condition, including the following:
 - Mental status
 - Respiratory status
 - Pulse rate and quality
 - Blood pressure
 - Skin color, temperature and condition
 - Adverse effects

Documentation

Any time a drug is administered, from a patient's supply or from your stock, this must be documented thoroughly. You must document: 1) the reason for administration, 2) drug name, 3) dose, 4) route of administration, 5) time(s) of administration, 6) any side effects noted, 7) how often administered and 8) any improvement noted and any changes in the patient's status.



Fig. 14-9, A–B: To administer medication, **(A)** physically give it to the patient. **(B)** When assisting, help get the medication ready and assist the patient in taking it, but do not physically administer it.

Role of Medical Oversight in Medical Administration

Medical direction, the oversight provided by a physician who assumes responsibility for care, provides direction on what medication to give, as well as the dose, route of administration and how often it is given. When receiving medical direction, you must repeat back the order for confirmation even if you are sure you understood correctly (**Fig. 14-10**).

ADMINISTERING ASPIRIN

Generic and Trade Names

Aspirin was the original trade name of acetylsalicylic acid (ASA). It is now marketed under several trade names, such as Ecotrin® Enteric Coated Aspirin, Excedrin® (which also contains acetaminophen), Pravigard® and St. Joseph® (**Fig. 14-11**). In countries where aspirin is trademarked (owned by Bayer), the term ASA is the generic name.

Indications

Aspirin, or ASA, was originally an analgesic, which is a type of pain reliever. However, today health care providers often use it for its blood-thinning capability to prevent blood clots. Aspirin is used to provide relief for mild-to-moderate pain, including headache, menstrual pain, muscle pain, minor pain of arthritis and toothache. It also reduces fever and inflammation. Aspirin may also be given for angina and heart attack (see **Chapter 13** for more information on aspirin and heart attacks). A health care provider should be consulted before using aspirin to treat or prevent any cardiovascular condition.

Contraindications

Patients already on blood thinners should not take aspirin. It should not be given to patients who have a known allergy to non-steroidal anti-inflammatory drugs (NSAIDs). Because of the rare complication of Reye's Syndrome, children and adolescents who show flu-like symptoms or who may have a viral illness such as chicken pox should not be given aspirin or products that contain aspirin. Women who are pregnant or nursing should avoid taking aspirin unless they are instructed to by their health care provider. Patients with asthma, ulcer or ulcer symptoms; a recent history of stomach or intestinal bleeding; or a bleeding disorder, such as hemophilia, should not take aspirin. Aspirin will not prevent hemorrhagic strokes and should not be given to someone showing signs and symptoms of a stroke.

Actions

Aspirin acts to thin the blood by reducing the platelets' ability to produce a chemical that helps form blood clots. To relieve pain, aspirin reduces inflammation at the source, thereby reducing the pain.

Side Effects

The majority of side effects and complications associated with aspirin are due to taking too much of the medication or from taking it for too long a period. However, side effects can occur with just a few doses in some people. The most common side effects include heartburn, nausea, vomiting and gastrointestinal bleeding. Some people are allergic to aspirin, so it is important to watch for an allergic reaction to the medication.



Fig. 14-10: When receiving medical direction from a physician, always repeat back the order for confirmation.



Fig. 14-11: Aspirin

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Enrichment

Basic Pharmacology (continued)

Expiration Date

It is important not to administer aspirin past its expiration date. The effect of the drug decreases if it is too old. Therefore, by giving a dose of expired aspirin, you will not know how much of the drug the patient will actually receive. Do not use the aspirin if there is a strong smell of vinegar as this may indicate the medication is expired.

Dosage

The dosages for pain relief and for blood thinning differ. The average adult dose for minor pain and fever relief is one to two 325 milligram (mg) tablets about every 3 to 4 hours, not to exceed 6 doses a day. For the prevention of a heart attack, the average adult dose is one 81 mg/low dose tablet daily.

A health care provider may recommend a stronger dosage of aspirin. Follow local protocols and medical direction before giving aspirin to treat or prevent cardiovascular conditions.

Administration

Aspirin is most commonly available in oral form; however, it is also available as a rectal suppository and in a liquid form for children.

ADMINISTERING NITROGLYCERIN

Generic and Trade Names

Nitroglycerin is the generic name for Nitrolingual[®] Pump Spray, Nitrostat[®] Tablets and the Minitran[®] Transdermal Delivery System. It is also available by the generic name.

Indications

Nitroglycerin is given to patients with angina pectoris, a condition in which the blood vessels in the heart constrict and do not allow enough blood and oxygen to circulate. This, in turn, causes chest pain.

Contraindications

Nitroglycerin should not be given to patients whose systolic blood pressure is below 90 mm/Hg. Also, it should not be given more often than prescribed (usually one to three times is indicated, with 5 minutes spaced between doses). Do not give nitroglycerin to patients taking sildenafil (Viagra[®]), as this could lead to life-threatening complications such as a dangerous drop in blood pressure. Nitroglycerin should not be given to individuals who have severe anemia or a brain injury, hemorrhage or tumor. Nitroglycerin may be harmful to an unborn baby.

Actions

Nitroglycerin dilates the blood vessels, allowing blood to flow more freely, thus providing more oxygen to the heart tissue.

Side Effects

Rapid dilation of the blood vessels can cause a severe and sudden headache. The headaches may become gradually less severe as the individual continues to take nitroglycerin. Other side effects may include dizziness, flushed skin of the neck and face, lightheadedness and worsened angina pain.

Precautions

Nitroglycerin tablets are reactive to light and should be stored in a dry area in a dark-colored container to maintain their potency.

Expiration Date

Check expiration dates for all types of nitroglycerin. Failure to do so may result in administering medication that is no longer active, thereby delaying proper treatment.

Dosage and Administration

Nitroglycerin sprays and tablets are usually administered as one spray or pill under the tongue, and can be taken by the patient up to three times, with 5 minutes between each dose, if there is no change in his or her condition. Have the patient sit while taking nitroglycerin as it can cause dizziness or fainting. Nitroglycerin is a very potent medication. It should never be given without a health care provider's order.

ADMINISTERING ORAL GLUCOSE

Action

Oral glucose acts by increasing the amount of blood glucose (sugar) in the bloodstream.

Indication

Oral glucose is administered to patients who have diabetes and whose blood sugar level has dropped below tolerable levels (**Fig. 14-12**). At this point, the insulin has no glucose to metabolize.

Contraindications

Oral glucose should not be given to patients with diabetes whose blood sugar is within normal range or above normal range. It also should not be given to patients who are unresponsive and unable to follow instructions to swallow safely.

Side Effects

Side effects may include nausea, heartburn and bloating.

Dose

The product comes as glucose tablets and in 15-gram, single-use tubes.

Route

Oral glucose is given by mouth.



Fig. 14-12: Administer oral glucose to patients with diabetes whose blood sugar has dropped below tolerable levels.

Enrichment

Blood Glucose Monitoring

Blood glucose monitoring refers to the measurement of blood sugar (glucose). Everyone's blood has some glucose in it because our bodies turn the food we eat into this form of sugar, which is transported throughout the body. Insulin, a hormone from the pancreas, helps get the glucose into our cells to be used for energy. Without insulin (e.g., in patients with Type 2 diabetes), the BGL rises, leading to long-term health complications if untreated. In patients taking insulin, low blood glucose creates critical health risks and must be treated immediately.

TESTING BGL WITH A GLUCOSE METER

Patients with diabetes check their BGLs regularly, often using a portable device called a *glucometer* (**Fig. 14-13**). Monitoring can be done at any time using a glucometer. The test requires a drop of blood on a test strip containing a chemical substance, which is then inserted into the glucometer. The drop of blood is obtained by piercing the skin of a finger pad with a sharp sterile device such as a lancet or needle.

USING A GLUCOMETER

- Ensure your hands are clean and the glucometer is in good working order.
- Wipe the pad of the patient's finger with an alcohol swab, or clean the finger with soap and water. Allow the skin to dry completely.
- Using a sterile lancet, prick the pad of the finger and allow a blood drop to form.
- Collect a drop of blood on the test strip.
- Insert the test strip into the glucometer, read and record the numerical result.

Read the owner's manual for the blood glucose meter carefully, and *only use the test strips specified for that meter*. Otherwise, the device may fail to give results or may generate an inaccurate reading.



Fig. 14-13: A glucometer

What the Numbers Mean

Although the result may vary depending upon the patient and the testing device used, it is generally accepted that the normal range before meals is 90–130 *milligrams per deciliter* (mg/dL) and after meals is less than 180 mg/dL.

Low blood glucose, also called hypoglycemia, occurs when the BGL drops below 70 mg/dL. This requires immediate treatment. If the patient is conscious, provide 4 ounces of fruit juice or regular soft drink or 2–5 glucose tablets, and recheck glucose in 15 minutes. If the patient is unconscious, seek medical attention immediately.

Pediatric Considerations

Blood Glucose Monitoring

The *American Diabetes Association* (ADA) warns of the problems that could be caused by blood sugar levels that are too low in children under 7 years of age. Young children require higher blood sugar levels than do adults for brain development. Also, children's food intake and activity level tend to vary quite a bit from day to day, causing blood sugar levels to fluctuate, so they are more at risk of blood sugar levels falling too low. Further, it may be difficult for very young children to report and describe symptoms of low blood sugar, so this may go undetected.

Also keep in mind that, before reaching puberty, children seem to be at lower risk of the complications of diabetes even when blood sugar levels are abnormally high. The ADA recommends aiming for the safe adult range of BGL only when children grow older and can recognize the early symptoms of BGLs dropping too low.