

# DIABETES



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# PURPOSE

- The purpose of this section is to help the learner understand the: basics of diabetes; information that needs to be gathered when screening a potential resident with diabetes; and accommodations an AFH will need to provide for a resident with diabetes.
- Blood sugar testing
- Diabetic ketoacidosis
- Exchange diet
- Food pyramid
- Hyperglycemia and hypoglycemia
- Insulin and oral diabetic agent

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# OBJECTIVES

- The learner will be able to:
  - ❑ Describe Type 1 and Type 2 diabetes;
  - ❑ List key questions to ask when screening potential residents with a diagnosis of diabetes;
  - ❑ Describe care guidelines for diabetes, routine monitoring and health problems related to diabetes;
  - ❑ Describe common signs and symptoms of high or low blood sugar and diabetic ketoacidosis;
  - ❑ Describe medication and diet management of diabetes;
  - ❑ Explore your own physical and emotional limits regarding the type of care required for residents with diabetes.

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# INTRODUCTION

- Diabetes is a disease in which the pancreas does not produce enough insulin, the hormone that regulates blood sugar, or the body cannot use the insulin produced. In either case, high levels of blood sugar (glucose) remain in the blood.
- There are two types of diabetes:
  - Type 1; and
  - Type 2.

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# TYPE ONE DIABETES

- Type 1 diabetes is usually diagnosed in children and young adults, and was previously known as juvenile diabetes. In type 1 diabetes, the body does not produce insulin. Insulin is a hormone that is needed to convert sugar (glucose), starches and other food into energy needed for daily life.

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# TYPE TWO DIABETES

- Type 2 diabetes is the most common form of diabetes:
  - The body does not produce enough insulin or the cells ignore the insulin.
  - Insulin is necessary for the body to be able to use glucose for energy.
  - Insulin takes the sugar from the blood into the cells. When glucose builds up in the blood instead of going into cells, it can lead to diabetes complications.

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# TYPE TWO DIABETES CONTINUED

- Not everyone with Type 2 diabetes requires insulin. Diabetes is controlled for some by:
  - Oral medication (oral hypoglycemics); and/or
  - Diet
- Type 2 diabetes may progress in some people to the point they require insulin:
  - An acute illness may require the temporary use of insulin for control.

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# TYPE TWO DIABETES CONTINUED

- Symptoms of Type 2 diabetes usually develops over a longer period of time and is less obvious. There may be no symptoms or the symptoms may include:
  - Blurred vision/difficulty focusing
  - Dry, itching skin
  - Frequent urination
  - Hunger
  - Increased thirst
  - Numbness/tingling of hands and feet
  - Slow-healing cuts and sores
  - Tiredness/fatigue
  - Vaginal infections

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# RELATED HEALTH PROBLEMS

- If untreated, Type 1 and 2 diabetes can cause serious health problems, including:
  - ❑ Blindness;
  - ❑ Dental problems;
  - ❑ Foot problems (infections/amputations);
  - ❑ Heart attack;
  - ❑ Kidney failure;
  - ❑ Nerve damage (numbness, changes in sensation);
  - ❑ Poor circulation and slow healing;
  - ❑ Sexual impotency; and
  - ❑ Stroke.

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# ORAL MEDICATIONS

- Oral medications help to produce more insulin and use insulin more efficiently:
  - They are not “insulin pills” or a substitute for insulin, and only work for people with a functioning pancreas;
  - Medications are usually taken:
    - 30 minutes before a meal;
    - With a meal; or
    - After a meal.
  - There are many types of oral medications available. One medication may be more effective than another for a particular person.

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# ORAL MEDICATION SIDE EFFECTS

- Some experience side effects from taking oral diabetic agents. *If a resident shows any side effects, notify the person's primary care practitioner immediately.* Possible but uncommon side effects include:
  - ❑ Skin rashes
  - ❑ Indigestion
  - ❑ Diarrhea
  - ❑ Nausea
  - ❑ Prolonged low blood sugar
  - ❑ Bitter or metallic taste in mouth

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# INSULIN

- Insulin for injection is a hormone product derived from purified beef or pork pancreases or synthetically produced in the laboratory. The latter is called “human insulin”; however, no insulin sold for injection comes from the human pancreas.
- There are four types of insulin used:
  - Short-acting:
    - Begins acting in 20 to 30 minutes and is gone five to seven hours later. It is most effective 2-4 hours after injection.

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# INSULIN CONTINUED

- ❑ Intermediate-acting:
  - Begins acting in 1-2 hours and last longer than short-acting insulin. It is most effective 4-6 hours after injection.
- ❑ Long-acting:
  - Takes the longest to begin acting within 4-6 hours after injection and lasts much longer than other insulin (28-36 hours) there is no specific peak of effectiveness.
- ❑ Rapid-acting:
  - Works faster than other insulin. It is given 15 minutes before a meal. It is most effective 1-2 hours after being injected. It is gone from the body 3-5 hours after being given.

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# PURCHASING INSULIN

- Purchase only what the resident's primary care practitioner has ordered. You cannot change the brand, type or strength of insulin without the prescribing practitioners approval.
- Read the label on the bottle before purchasing and check:
  - ❑ Brand name
  - ❑ Type
  - ❑ Strength
  - ❑ Species (beef, pork, beef/pork, "human")
  - ❑ Expiration date

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# PURCHASING INSULIN CONTINUED

- Purchase the right insulin syringes. They must match the strength of the insulin. For example, if a resident uses U-100 insulin, syringes must be marked U-100.
- Talk with the pharmacist if you have any questions.

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# INSULIN STORAGE

- Store insulin as directed on the manufacturing label.
  - If it requires refrigeration AFH rules require all medications be locked including if stored in the refrigerator. OAR 411-050-0655.
- Open vials are good for one month from the date of opening. Do not use insulin that changes color or becomes clumped or granular in appearance.

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# ADMINISTRATION OF INSULIN

- Insulin injections may be:
  - Self-administered by the resident;
  - Given by a family member;
  - Given by a registered nurse (RN) or licensed practical nurse (LPN); or
  - Given by the AFH provider if delegated by a registered nurse under standards of the Oregon Board of Nursing:
    - RN delegation of insulin includes teaching the provider how to properly draw up the insulin, injecting the insulin and teaching about side effects and other specific information regarding the medication and the resident's condition.

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# DIET MANAGEMENT

- If a special diet is ordered by their physician follow the orders carefully:
  - If you do not understand the diet ordered, contact the resident's primary care practitioner;
  - Request a referral to a registered dietician if the resident has never had a consultation. Attend the appointment with the resident so you are able to ask questions;
  - There are many online resources available that explain common diabetic meal planning.

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# DIET MANAGEMENT CONTINUED

- Meal planning for diabetes management includes:
  - Choosing healthy foods;
  - Eating the right amount of food;
  - Eating meals at the right time.
- **MyPlate**, is a good nutrition planning tool for all people, including those with diabetes.

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# ACTIVITY MANAGEMENT

- Exercise improve diabetes control. Physical activity influences blood sugar. In managing diabetes, any change in the level of exercise or physical activity should be considered:
  - ❑ Discuss exercise program with the resident's physician.
  - ❑ Conduct exercise routines the same time each day.
  - ❑ Plan ahead if an activity will be prolonged such as an outing to the beach. Plan for at least two snacks.

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# ACTIVITY MANAGEMENT CONTINUED

- Encourage the resident to take these precautionary measures:
  - ❑ Carry a form of fast-acting sugar in case blood sugar drops too low (e.g., hard candy that is not sugar free; cubes or packets of sugar; a six-ounce can of fruit juice; or commercial products such as Dex 4 glucose tablets)
  - ❑ Drink extra (sugar-free) liquids before, during and after strenuous or prolonged activity
  - ❑ Wear a diabetes bracelet or necklace and carry a diabetes identification card

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# MONITORING DIABETES

- Routine monitoring is important in managing diabetes and reduces emergencies from high or low blood sugar levels.
- Monitoring routine depends on a resident's individual needs. The resident's physician, diabetes educator or nurse consultant can help you develop a monitoring system.
- There are three methods to monitor diabetes:
  - Blood for glucose;
  - Urine for ketones; and
  - Urine for glucose.

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# DIABETIC KETOACIDOSIS

- High levels of urine ketones with high levels of blood glucose (diabetic ketoacidosis) are life-threatening if not treated immediately.

Warning signs include:

- ❑ Unusual increase in hunger and/or thirst;
- ❑ Stomach pain, nausea or vomiting;
- ❑ Frequent urination any time of day;
- ❑ Increased tiredness or sleepiness;
- ❑ Breathing fast and deep;
- ❑ “Fruity” or “acetone” breath; and
- ❑ Unexplained weight.

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# RECORD KEEPING

- Records help you and the resident's physician spot problems and make necessary changes in diet, exercise or medication routines. Chart the following information:
  - Date and time of each test;
  - Blood glucose test result;
  - Ketone test result, if directed to test;
  - Medication type/dosage and time taken; and
  - Anything that may have affected blood glucose levels (e.g., more or less food eaten than usual, extra physical activity).

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# COMPLICATION OF DIABETES

- Despite precautions, complications of diabetes can arise due to illness, infection or other factors. Two major complications of diabetes are:
  - Hyperglycemia (high blood sugar); and
  - Hypoglycemia (low blood sugar).
- Blood glucose levels vary even when a person is taking insulin blood glucose can be too high.

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# HYPERGLYCEMIA

- Hyperglycemia may happen when the person is ill or under unusual stress, or the medication-diet-activity is out of balance. Medications that raise glucose levels include:
  - ❑ Water pills (diuretics);
  - ❑ Corticosteroids;
  - ❑ Thyroid medications;
  - ❑ Seizure medication; and
  - ❑ Excessive doses of niacin that also raises blood glucose levels

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# HYPERGLYCEMIA CONTINUED

- Hyperglycemia can lead to two life-threatening conditions:
  - **Diabetic ketoacidosis**, which is detected by testing for ketones in the urine (refer to previous discussion on monitoring). It can develop quickly, especially if the person is sick with a cold, flu or other infection.
  - **Dehydration** can develop rapidly in older persons. It usually occurs with vomiting and frequent urination.

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# HYPERGLYCEMIA WARNING SIGNS

- Common warning signs of hyperglycemia:
  - Unusual increase in hunger and/or thirst;
  - Frequent urination, especially during the night;
  - Dry or itchy skin;
  - Increased tiredness or sleepiness;
  - Breathing fast and deep;
  - Problems seeing clearly;
  - Infections; and
  - Cuts or sores that heal slowly.

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# HYPERGLYCEMIA INTERVENTIONS

- If the resident is displaying signs and symptoms of hyperglycemia:
  - Follow the written instructions for the resident.
  - Perform blood glucose tests (glucometer).
  - Notify the resident's primary care practitioner or specialist. Be ready to report the test results.
  - Document your observations and actions, the practitioner's instructions and resident's response.
  - Contact the RN who delegated the insulin injections. The change in the resident's condition may require changes in the instruction the RN originally gave you.

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# HYPOGLYCEMIA

- Hypoglycemia occurs when the blood sugar falls too low, usually below 70 mg/dl. It usually occurs in a few minutes.
    - *If not treated immediately, it can cause unconsciousness, seizures, and even death.*
  - Low blood sugar can happen to any person who has diabetes, whether the person takes insulin or oral medications. Older people are particularly prone to hypoglycemia because of reduced kidney function.
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# HYPOGLYCEMIA CONTINUED

- Hypoglycemia sometimes referred to as “insulin reaction or shock” can result from:
  - ❑ Not eating all of a meal;
  - ❑ Missing a meal or a snack;
  - ❑ Eating meals or snacks at the wrong time;
  - ❑ Drinking alcohol ;
  - ❑ Increased exercise/activity beyond normal routine;
  - ❑ Too much insulin or oral medication; and
  - ❑ Diabetes becoming “milder” after recovery from an illness, injury or surgery

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# HYPOGLYCEMIA CONTINUED

- Medications that can lower blood sugar:
  - ❑ Oral diabetes medication and insulin;
  - ❑ Aspirin;
  - ❑ Anticoagulants (blood thinners);
  - ❑ Certain medications for arthritis;
  - ❑ Certain medications for high blood pressure;
  - ❑ Certain antibiotics;
  - ❑ Certain medications for depression; and
  - ❑ Certain medications for gout.

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# HYPOGLYCEMIA WARNING SIGNS

- Common warning signs of hypoglycemia:

- Sweating
- Weakness, fatigue
- Dizziness or shakiness
- Paleness
- Headache or blurred vision
- Hunger
- Numbness/tingling in the mouth or on the lips
- Nervousness or mental confusion
- Changes in behavior (crying, combative, argumentative)
- Heart palpitations

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## HYPOGLYCEMIA WARNING SIGNS CONTINUED

- Severe warning signs of low blood sugar include:
  - Seizures; or
  - Unconsciousness or coma.
- **Severe warning signs of low blood sugar are most likely to occur during the night, when the person is asleep. Call 9-1-1 immediately.**

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# HYPOGLYCEMIA INTERVENTIONS

- If hypoglycemia is suspected and it is not an emergency:
  - Follow the written instructions for the resident;
  - Perform blood glucose tests (glucometer);
  - Treat resident with a fast-acting food containing sugar even if unable to test blood glucose:
    - 1/2 cup of regular soda or fruit juice
    - 1 tablespoon sugar or honey
    - 1 small box of raisins
    - 1 cup of skim milk
    - 5 small sugar cubes

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## HYPOGLYCEMIA INTERVENTIONS CONTINUED

- ❑ Test blood sugar again in 20 minutes. If the blood sugar is still low, call the resident's physician;
- ❑ Encourage the resident to rest quietly until glucose returns to normal;
- ❑ Review resident's routine/dietary intake. Identify source of problem and make adjustments;
- ❑ Contact the RN who delegated the insulin;
- ❑ Keep the resident's physician informed;
- ❑ Document what you observed, what you did and the results.

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# HYPOGLYCEMIA INTERVENTIONS CONTINUED

Do not attempt to give food or fluids to a person who is not responding or unconscious.

***Call 9-1-1 immediately***

*Do not give candy bars, chocolate or cookies.  
They contain fat that slow down recovery time.*

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# SICK DAY PLAN

- Residents who have diabetes should always take their diabetes medication. However, during illness, they may find it difficult to maintain medication or diet routines:
  - Develop a sick day plan ahead of time with the delegating RN or RN consultant (if the resident does not take insulin);
  - Be sure substitute caregivers know about the plan.

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# SICK DAY PLAN CONTINUED

- If resident who has diabetes becomes ill and/or nausea or vomiting prevents them from eating or drinking liquids:
  - Call the resident's physician;
  - Be prepared to report on:
    - Resident's ability to take food and fluids;
    - Dosage and schedule for diabetes medication;
    - Details about how the person is feeling, including temperature;
    - Results of blood glucose (and urine ketone) testing; and
    - Name of any newly prescribed non-diabetic medication the resident is taking.

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# SICK DAY PLAN CONTINUED

- ❑ Be sure the resident takes their diabetes medication. The health care practitioner will advise you of any changes;
- ❑ Encourage fluid intake. Substitute fruit juices and regular soft drinks (7-Up/ginger ale) if the resident is unable to eat;
- ❑ Follow the normal meal plan if the resident is not nauseated;
- ❑ Monitor blood glucose before meals and bedtime.

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# GENERAL MANAGEMENT

- A consistent routine in the management of diabetes cannot be overemphasized:
  - Maintaining a constant balance between medication, diet and physical activity is the key to maintaining stable blood glucose control.
- Because of individual differences, be sure you understand the treatment goals for each resident who has diabetes:
  - Be observant, diligent and accurate in monitoring and reporting to health care professionals.

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# GENERAL MANAGEMENT CONTINUED

- Management of residents who have diabetes may be more difficult due to:
  - ❑ Decreased ability to exercise;
  - ❑ Strong food likes and dislikes;
  - ❑ Emotional or mental problems (depression, loneliness, memory loss);
  - ❑ Hearing loss;
  - ❑ Vision problems, including blindness;
  - ❑ Dental or denture problems.

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# GUIDELINES FOR CARE

- To help promote the general health and well-being of the resident who has diabetes:
- Encourage walking for exercise. Walking improves circulation and helps control weight.
- Remind the resident to keep pressure off nerves and blood vessels. The person should avoid crossing the legs at the knees or sitting in furniture that presses against the back of the knee or calf.

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# GUIDELINES FOR CARE CONTINUED

- Encourage clothing that is comfortable, easy to manage and protective:
  - Wear clothing that does not restrict circulation.
  - Dress warmly during cold weather. Exposure to cold constricts blood vessels, which hampers circulation.
  - Wear protective gloves during activities that may injure the hands such as gardening or washing dishes.
  
- Encourage the resident to avoid smoking. Circulatory problems common in people with diabetes are made worse when smoking.

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# FOOT CARE

- People who have diabetes are at greater risk of developing foot problems because of nerve damage and poor circulation. To help prevent foot problems:
  - Inspect the feet daily. Check all areas of the feet (top, bottom, between toes) for:
    - Cuts, blisters, scratches, cracks, corns or calluses
    - Signs of infection
    - Redness or discoloration
    - Swelling
    - Tenderness
    - Warmth

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# FOOT CARE CONTINUED

- Wash the feet daily
  - ❑ Use lukewarm, soapy water. Do not soak the feet.
  - ❑ Pat feet dry. Dry thoroughly between the toes.
  - ❑ Apply moisturizer to feet after washing them. Do not apply moisturizer between toes. Moisturizer should not contain alcohol. Lanolin is universally accepted.
  - ❑ Consult a health care professional for specific instructions.
- Do not use chemicals, antiseptics tape or adhesive bandages on feet. Consult a health care professional about alternative products.

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# FOOT CARE CONTINUED

- Protect feet from exposure to extremes in temperature:
  - Remind the resident not to use feet to test temperature of bath water;
  - Wear warm footwear in cold weather;
  - Do not use heater, heating pad or hot water bottle to warm feet. Suggest the resident use loose-fitting bed socks for cold feet.
- Provide clean, properly fitted socks daily. The person should not wear tight, mended, wrinkled or seamed socks.

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# FOOT CARE CONTINUED

- Encourage proper fitting footwear:
  - ❑ Made of soft leather, canvas or other material that allows the circulation. Walking shoes are a good example.
  - ❑ Worn with socks or stockings.
  - ❑ Worn indoors and outdoors (including at beach).
  - ❑ Worn for short periods when new (give special attention to feet when resident is breaking in new shoes).

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# FOOT CARE CONTINUED

- Inspect the inside of the shoes daily. Look for foreign objects, nail points, rough areas and torn linings.
- Arrange for a health care professional to treat foot problems.
- *Toenails should be cut by a physician, a podiatrist or a nurse knowledgeable about diabetes.*

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# SKIN CARE

- People who have diabetes are prone to skin problems:
  - They have poor circulation and lowered sensitivity to pain and temperature extremes;
  - They are at risk of developing pressure sores and infections.
  - Prevention is a priority:
    - Look for signs of redness, swelling, tenderness and warmth in any area. Note any skin discoloration or sores. Notify the doctor at the first sign of a skin problem.

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# SKIN CARE CONTINUED

- ❑ Treat all injuries quickly:
  - Wash cuts and scrapes with clean soap and water.
  - Cover injury with a dry, sterile bandage.
  - Call a health care professional for specific instructions.
  - Notify the resident's doctor if cuts or bruises do not begin healing within 24 hours, or if redness, heat, swelling or pus is present.

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# SKIN CARE CONTINUED

- ❑ Lightly apply lanolin to very dry hands and feet. Moisturizing skin reduces cracking and risk of infection. Do not apply moisturizer or oil to infected areas or between toes.
- ❑ Apply sunscreen to protect the skin. A sun hat also helps prevent sunburn.
- ❑ Test bath water for resident. Use inner wrist or elbow. Water should feel warm. If the resident bathes without assistance, remind the person to take precautions. Suggest turning on the cold water first and gradually adding hot water.

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# MOUTH CARE

- People who have diabetes are prone to gum infections and loss of teeth. To prevent major problems, take these steps:
  - Inspect the mouth daily. Look for reddened areas and swelling. Suspect mouth or gum problems if the resident:
    - Avoids eating foods that sting sensitive gums;
    - Leaves hard-to-chew foods on the plate;
    - Refuses to eat; or
    - Suddenly refuses to wear dentures.
  - Consult the resident's dentist about treatment options;
  - Encourage regular dental visits.

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# EYE CARE

- People with diabetes are more likely to develop eye problems. To reduce the risk of eye problems:
  - ❑ **Encourage yearly eye examinations.**
  - ❑ **See an eye doctor at once if resident has:**
    - Blurred or double vision
    - Narrowed field of vision or dark spots
    - Feeling pressure or pain in the eyes
    - Difficulty seeing in dim light
  - ❑ Check with their health care practitioners about monitoring the resident's blood pressure.

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# BLADDER PROBLEMS

- Glucose in the urine and incomplete emptying of the bladder contribute to bladder infections in older persons who have diabetes. To prevent problems:
  - Encourage drinking about two quarts of water daily (unless fluid intake is restricted for other medical reasons).
    - Increased fluid dilutes urine, reducing the risk of bacterial growth and irritation of bladder walls.
    - A full bladder will also prompt the resident to empty the bladder.

# DISCUSSION/QUESTIONS

