

MODULE

6



Cathy Yeulet

**DIABETES COMPLICATIONS:
IDENTIFICATION AND PREVENTION**

I. TYPES OF DIABETES COMPLICATIONS

The fundamental complication is damage to the small blood vessels (capillaries) by excess glucose in circulation. This leads to damage to the heart and larger vessels (arteries) of the circulatory system.

A. Micro Vascular

1. Affects the small arteries, the capillaries and the nerves.
2. Eyes, kidneys, feet, skin and stomach.
3. Retinopathy: damage to the retina
4. Nephropathy: damage to the kidneys
5. Neuropathy: damage to the nerves

B. Macro Vascular

1. Affects the large arteries to internal organs and the brain (aorta, carotids, etc.)

II. MAIN CIRCULATORY COMPLICATIONS

A. Atherosclerosis Manifested As:

1. Coronary artery disease
 - a. Angina
 - b. Heart attack
2. Stroke
 - a. Disability (damage to the brain)
 - b. Death
3. Peripheral artery disease
 - a. Reduced circulation to lower extremities



B. Related Symptoms Are:

1. Coronary artery disease
 - a. Chest pain or pressure
 - b. Irregular heartbeat
 - c. Difficulty breathing
2. Stroke
 - a. Dizziness
 - b. Loss of vision
 - c. Difficulty speaking
 - d. Sudden paralysis on one side
 - e. Facial droop on one side



3. Peripheral artery disease
 - a. Weakness and pain in legs
 - b. Weak pulses and cold feet

C. Smoking and the Cardiovascular System

1. Tobacco worsens vascular damage produced by diabetes.
2. Accelerates atherosclerosis.
3. Accelerates coronary artery disease, stroke and PAD.
4. Increases blood pressure.
5. Enhances effects of cholesterol and glucose on cardiovascular system.



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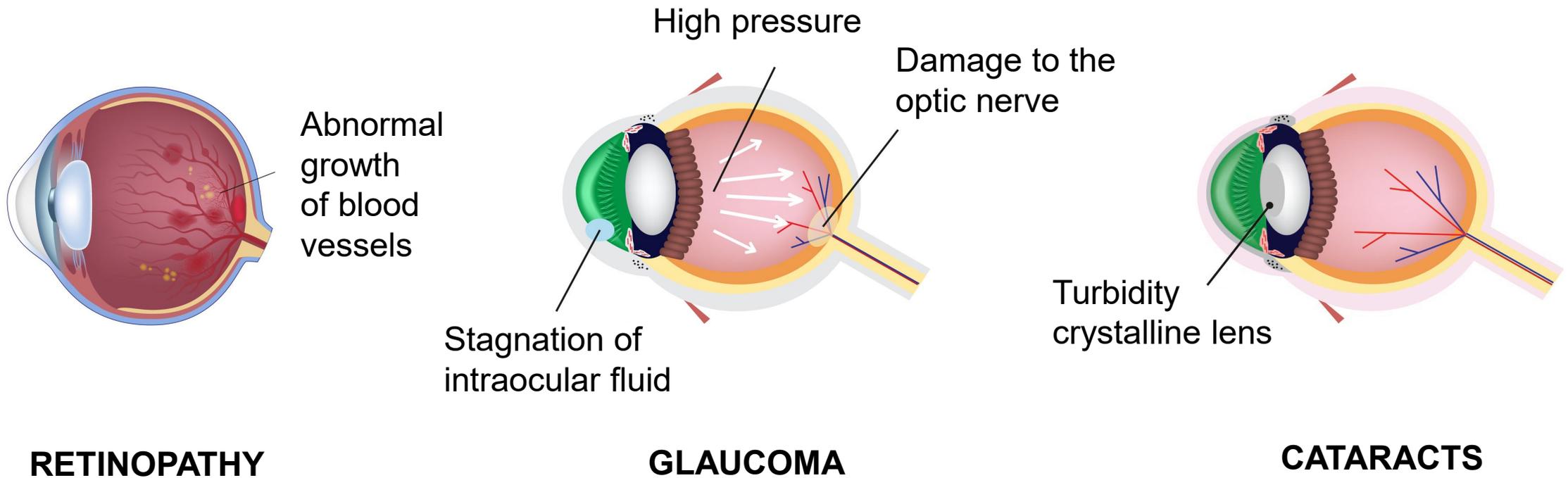
D. Preventing Complications of the Circulatory System

1. Keep blood pressure levels in ideal range for diabetes:
 - a. $< 140/90$ mm Hg
2. If a smoker, get help quitting
3. Consult the nutritionist about appropriate diet
4. Consult the doctor about:
 - a. Cholesterol levels
 - b. Blood pressure
 - c. Electrocardiogram



III. EYE COMPLICATIONS

A. Types of Eye Complications



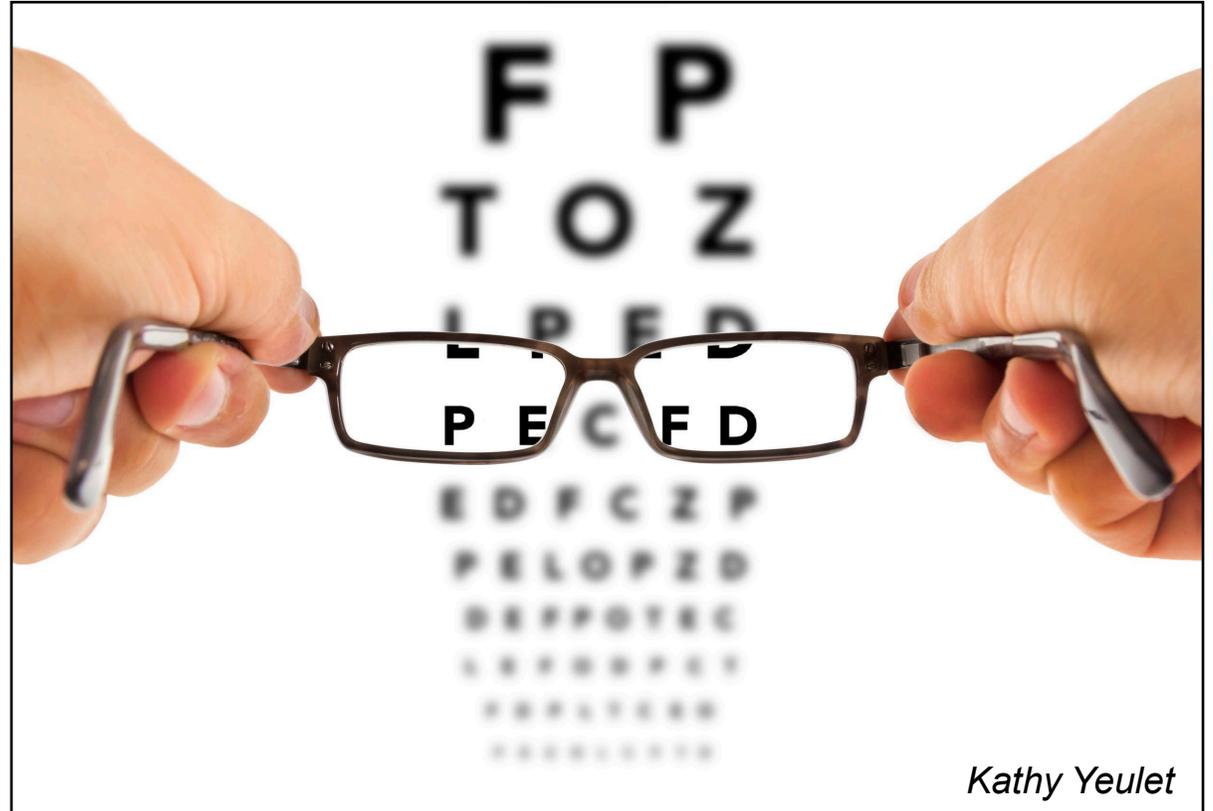
RETINOPATHY

GLAUCOMA

CATARACTS

B. Signs of Diabetic Eye Disease

1. You may have it without knowing it
2. Problems when reading
3. Cannot see clearly
4. Seeing a halo around lights
5. Seeing dark spots or light flashes
6. Reduced peripheral vision



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C. Smoking and Eye Disease

1. People with diabetes are already at risk for eye-related complications.
2. Smoking can contribute to further complications:
 - a. Thousands of active compounds in tobacco smoke are toxic and potentially damaging to the eye.
 - b. Smokers have 2 to 3 times the risk of developing cataracts as nonsmokers.
 - c. Smoking may accelerate the development of, or worsen, diabetic retinopathy by reducing oxygen supply to the eyes.



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D. How to Prevent Damage to the Eyes

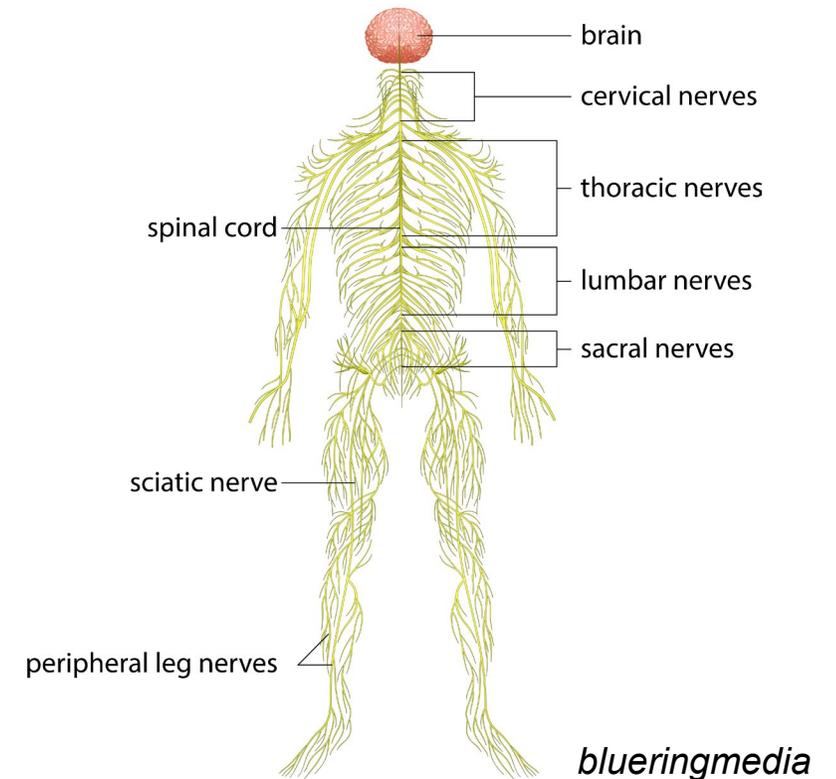
1. Maintain blood glucose levels within normal range.
2. Quit smoking or avoid second-hand smoke.
3. Have an eye exam with an eye specialist every year.
 - a. This should include a dilated eye exam every year and eye pressure exam.
4. Diabetes leads to blindness if eye care is inadequate.



IV. COMPLICATIONS OF THE NERVOUS SYSTEM (NEUROPATHIES)

A. Types of Neuropathies

1. Peripheral: nerves go from your spinal cord to your arms, hands, legs and feet.
2. Autonomic: nerves go from your spinal cord to your lungs, heart, stomach, intestines, bladder and sex organs.
3. Focal:
 - a. Cranial: nerves are in your brain and spinal cord
 - b. Facial: nerves go from your brain to your eyes, mouth, ears and other parts of your head.



B. Symptoms of Neuropathies

1. Pain, burning, numbness or cramping in hands and legs.
2. Abnormal sweating
3. Dizziness
4. Difficulty urinating
5. Problems with sexual ability



TopVectors

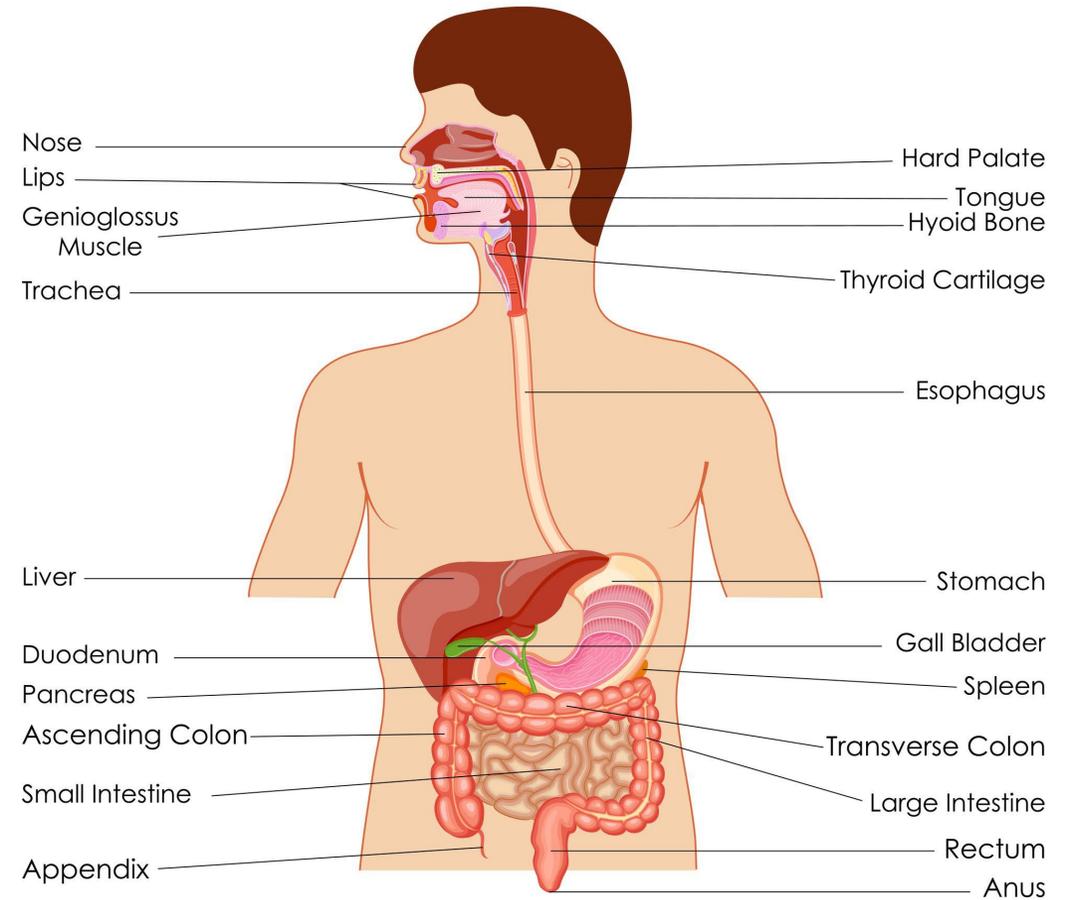
C. Neuropathy of the Digestive System

1. Problems

- a. Slow digestion
- b. Nausea
- c. Vomiting
- d. Diarrhea

2. Solutions

- a. Eat often
- b. Eat small food portions
- c. Avoid fats/fatty foods



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D. Preventing Damage to the Nervous System

1. Keep sugar levels within normal range.
2. Pay attention to any changes in temperature and in sensitivity in feet, hands and legs.
3. Examine feet daily.
4. Make sure the doctor examines nerve function at every visit.



V. FOOT COMPLICATIONS

A. Symptoms of Foot Complications

1. Loss of feeling
2. Foot deformation
3. Blisters
4. Wounds or ulcers
5. Slow healing process
6. Extreme cases: amputation



B. Smoking and Foot Complications

1. Cigarette smoking damages blood vessels (arteries).
2. Smokers are more than 10 times as likely as non-smokers to develop peripheral artery disease (PAD), resulting in amputations.
3. People with diabetes are at greater risk for severe PAD.
4. More than 60% of non-traumatic lower-limb amputations occur in people with diabetes.
5. Prevalence of foot ulcers increases with smoking.
 - a. 10.3% among nonsmokers
 - b. 11.9% among former smokers
 - c. 15.8% among current smokers

C. Using the Monofilament

1. Have the person being tested look away or close his or her eyes.
2. Randomly test the sites shown on the diagram. Avoid any ulcers, calluses or sores.
3. Touch the monofilament to the skin until it bends, then gently remove it.
4. Elicit a response from the patient at each site. Lack of sensation at any given site may indicate diabetic neuropathy.
5. The monofilament should be cleaned after each patient exam.

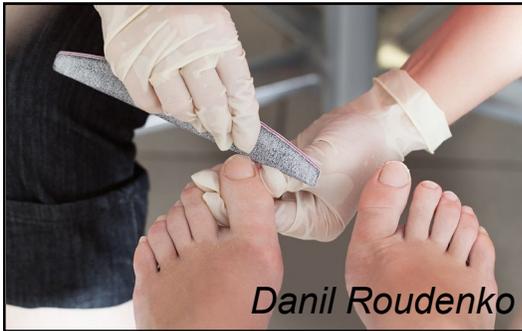


D. Protecting the Feet

People with diabetes should:

1. Examine their feet every day after washing and drying them.
2. Clip nails correctly.
3. Ask for help if they cannot see clearly.
4. Communicate any color change to their feet to a doctor.
5. DO NOT cut bunions or calluses.
6. Use adequate footwear.
7. Check shoes before putting them on.
8. Protect feet from extreme cold or heat.
9. NEVER walk barefoot.

E. Taking Care of the Feet



File nails with caution/get help



Take care of calluses



Apply cream outside the toes, never between



Elevate feet when sitting



Choose comfortable shoes

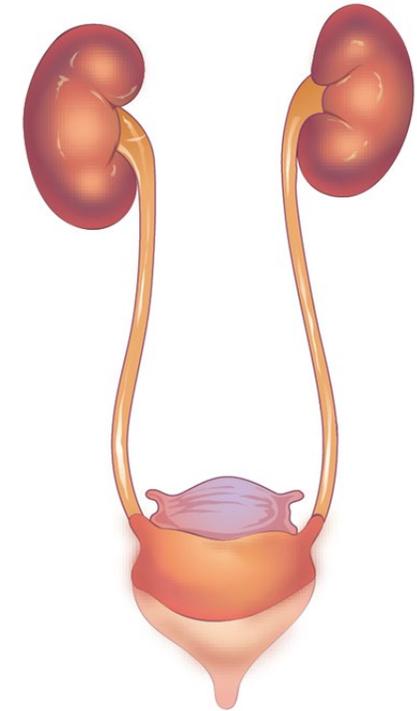


Walk and exercise regularly

VI. COMPLICATIONS OF URINARY SYSTEM AND SEXUAL ORGANS

A. Kidney Complications

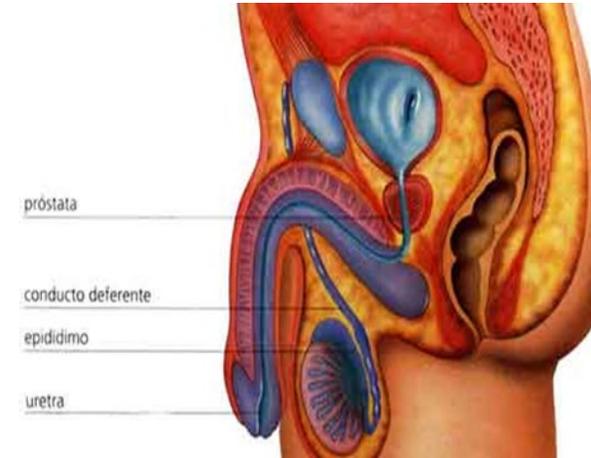
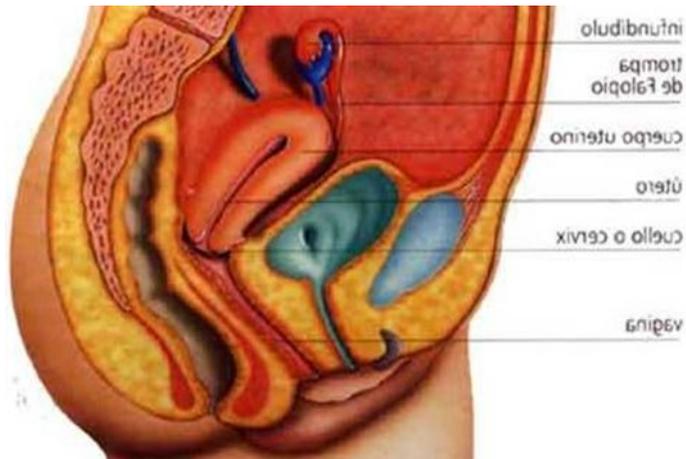
1. The kidney cannot eliminate waste in the urine.
2. Retaining liquids in the body contributes to high blood pressure.
3. May require chronic dialysis because of kidney insufficiency or failure.
4. Problems of incontinence.
5. Remember: this damage is produced silently.



VI. COMPLICATIONS OF URINARY SYSTEM AND SEXUAL ORGANS

B. Sexual Organ Complications

1. Sexual dysfunction in men.
2. Lack of sensitivity in women.
3. Also yeast infections in women.



C. Protecting the Kidneys

1. Keep sugar levels within normal range.
2. Keep blood pressure under 140/90 mmHg.
3. Have at least one urine test per year.
4. Avoid missing doctor appointments.
5. Ask for medication based on test results.



VII. TAKING CARE OF TEETH

A. Effects of Diabetes and Smoking

1. Diabetes reduces saliva and causes dry mouth.
2. Smoking changes blood supply – causing weaker gums and slowing healing of the mouth.

B. Protecting the Mouth

1. Control glucose levels
2. Avoid smoking; get help quitting.
3. Brush after each meal and use dental floss.
4. Avoid dry mouth.
5. Inform the dentist about diabetes status and ask for deep cleaning.
6. Make appointment with dentist every 3-6 months (if you have teeth) or every year (if you don't have teeth.)



VIII. OTHER TOBACCO RELATED COMPLICATIONS

A. Cancer

1. Mouth
2. Throat
3. Lung
4. Bladder

B. Other Effects on the Body

1. Depressed immune system
2. Irritation and inflammation of gastrointestinal system
3. Reduced bone density
4. Sinusitis and rhinitis

C. Pregnancy and Smoking

1. Low birth weight
2. Placental problems
3. Stillbirth/miscarriage
4. SIDS
5. Preterm labor

IX. IMMUNIZATIONS

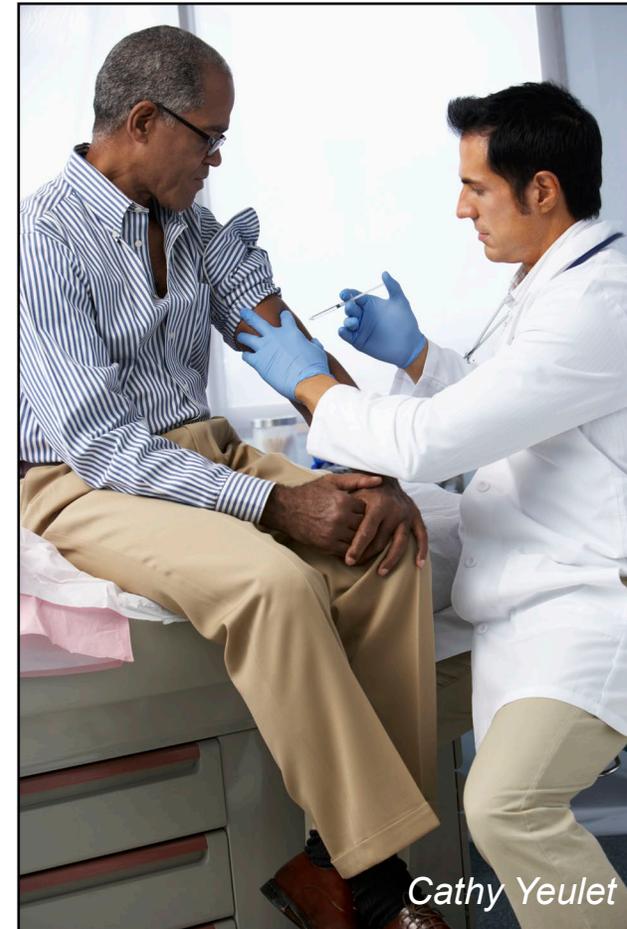
A. Immunizations for Adults

1. Influenza (annual)
2. Pneumococcus (once; reinforce at 65 years)
3. Tetanus (reinforce every 10 years)

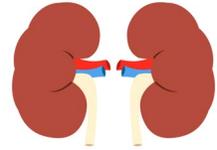
1. Hepatitis B
2. Shingles

B. Challenges for Vaccination

1. Do not have time
2. Vaccine may not be effective
3. Do not feel at risk
4. Forgot to have one
5. Providers do not recommend a vaccine
6. Costs may be a problem



X. PREVENTIVE VISITS TO DIABETES SPECIALISTS

<p>Primary Care Physician</p> 	<p>Eyes Ophthalmologist</p> 	<p>Feet Podiatrist or Orthopedist</p> 	<p>Heart Cardiologist</p> 	<p>Kidney Nephrologist</p> 	<p>Nervous System Neurologist</p> 	<p>Treatment Endocrinologist</p> 
<p>Mental Health Psychologist or Psychiatrist</p> 	<p>Digestive Gastro- Enterologist</p> 	<p>Teeth Dentist</p> 	<p>Diet Nutritionist or dietitian</p> 	<p>Self-care Diabetes Educator</p> 	<p>Community Health Worker</p> 	<p>Other</p>

This concludes Module 6: Diabetes Complications: Identification and Prevention. For more information on this topic, please see the curriculum.



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