GENITOURINARY COMPLICATIONS

Two of the very important genitourinary complications of diabetes are urinary tract infections and erectile dysfunction.

Urinary Tract Infections:
Diabetes is a risk factor for urinary tract infections (UTIs). UTIs are much more common in women than men, whether they have diabetes or not. Although the reason for the association between diabetes and UTIs is not completely understood, it may be mediated by a combination of factors, including neurogenic bladder and impaired immune system function. Neurogenic bladder is linked to autonomic neuropathy, as impaired innervation of the bladder leads to incomplete emptying (and thus a nidus for infection). Impaired immune system function results from decreased blood flow, in which an insufficient amount of leukocytes is transported to the area of infection, allowing it to persist longer than normal. Regardless of the cause, if left untreated, UTIs can spread up the ureter and into the kidney to cause acute pyelonephritis, a serious infection of the kidney.

Erectile Dysfunction:
Erectile dysfunction in diabetes can be caused by nerve damage or impaired blood flow. With nerve damage, the parasympathetic activation of the penis is interrupted and is thus incapable of producing erection. Since increased blood flow to the penis is responsible for the mechanics of erection, impairment of blood flow will make it difficult to both initiate and sustain an erection.

More information about the genitourinary complications of diabetes is discussed in the following articles:

History:
The patient with a UTI will typically complain of pain with urination, voiding small volumes, and urinary urgency and frequency. However, some UTIs may be asymptomatic and discovered by findings of white blood cells or bacteria on a urinalysis.

The chief complaint of a patient with erectile dysfunction will be an inability to initiate or sustain an erection.

Physical Exam:
Although physical exam is not useful to detect UTIs, one should look for fever and costovertebral angle tenderness, which would suggest pyelonephritis.

For erectile dysfunction, in addition to a routine physical exam, femoral and peripheral pulses should be noted as an indication of peripheral vascular disease (PVD). PVD is common in people with diabetes and may contribute to erectile dysfunction.

Tests:
For UTIs, urinalysis will show pyuria (white blood cells in the urine) and sometimes bacteruria. As UTIs are easily treated in most cases with inexpensive antibiotics, urine culture is not necessary routinely and should be reserved for patients with recurrent UTIs or for those who do not respond to antibiotics.

For erectile dysfunction, the value of hormone testing for testosterone (unrelated to diabetes) is debated. Nocturnal penile tumescence (NPT) testing is a method that can determine the number and tumescence of erectile episodes during sleep. Men with impaired NPT often have peripheral vascular disease or autonomic neuropathy (for which diabetes is a risk factor).

Treatment:
If history and urinalysis imply the presence of a UTI, antibiotics are initiated.
For erectile dysfunction, the leading pharmacologic treatments are the **phosphodiesterase inhibitors**: sildenafil, vardenafil, and tadalafil. These medications prolong nitric oxide’s vasodilating effects, thus helping to both initiate and maintain erection.

Self Assessments:
Phosphodiesterase inhibitors like sildenafil are helpful in treating erectile dysfunction because they:

A. Improve blood glucose levels  
B. Improve nerve conduction  
C. Help control hypertension  
D. Prolong nitric oxide’s vasodilating effects  

**Explanations:**
A. Incorrect.  
B. Incorrect.  
C. Incorrect. Although sildenafil can lower blood pressure, because of its intermittent use (and other effects), it is not a good choice for hypertension. Of note, the combination of sildenafil and nitrates (e.g., nitroglycerin) can lead to profound hypotension.  
D. Correct! By prolonging nitric oxide’s vasodilating effects, phosphodiesterase inhibitors partially combat the impaired blood flow that results from peripheral vascular disease in people with diabetes. Thus, erectile tissue is able to swell with more blood, improving one’s ability to initiate and maintain erection.

Urinary tract infections (UTIs):

A. Are more common in men with diabetes than women with diabetes  
B. May be partially caused by a neurogenic bladder  
C. Always involve pain with urination  
D. Are treated using corticosteroids  

**Explanations:**
A. Incorrect. UTIs are more common in women than men, with or without diabetes.  
B. Correct! Impaired innervation of the bladder (associated with autonomic neuropathy) leads to incomplete emptying, which produces a nidus for infection.  
C. Incorrect. UTIs may be completely asymptomatic and are discovered by findings of white blood cells or bacteria on a urinalysis.  
D. Incorrect. Since a decreased blood flow from peripheral vascular disease has also compromised the immune response, further dampening this response with corticosteroids would not be prudent. Instead, it would be much more beneficial to help the immune system fight the infecting bacteria by using antibiotics.