The Pharmacist’s Role in Improving Outcomes in Renal Transplantation

EDUCATIONAL OBJECTIVES

Upon completion of this activity, participants will be better able to:

1. Define the importance of medication adherence for patients receiving renal transplants;
2. Describe factors that influence medication nonadherence in patients receiving transplants;
3. Discuss the impact of cardiovascular disease on patients receiving transplants;
4. Describe the impact of adverse effects on adherence to transplant-related medications; and
5. Develop a plan to implement a specialty pharmacy service for patients with renal transplants.

Post-test/Rationale

1. How can specialty pharmacies help to increase adherence to immunosuppressant medications in renal transplant recipients?

   A. Establish a collaborative practice agreement to manage diabetes medications
   B. Provide education on adverse effect management and financial assistance***
   C. Adjust antihypertensive medications to decrease cardiovascular risk factors
   D. Enhance education prior to discharge from the hospital

Correct answer: B

Rationale (Objective 5): Tschida and colleagues reported on the benefits of a specialty pharmacy service for renal transplant recipients that provided medication delivery in addition to refill reminders and adherence screening and intervention. Educational information was also provided regarding adverse effect management and financial assistance.

2. What cardiovascular adverse effect is associated primarily with cyclosporine but not with tacrolimus?

   A. Hypertension
   B. Hyperglycemia
   C. Hypercholesterolemia***
   D. Hyperkalemia

Correct answer: C

Rationale (Objective 4): Hyperglycemia is associated with tacrolimus, and both tacrolimus and cyclosporine may cause hypertension. Of the calcineurin inhibitors, cyclosporine has the greatest effect on cholesterol.
3. What is the most common cause of death in patients after renal transplant?

A. Cardiovascular disease***  
B. Infection  
C. Graft loss  
D. Cancer

Correct answer: A  
Rationale (Objective 3): Renal transplant recipients are more likely to die from cardiovascular disease than from any other cause, even with a functioning graft. The rate of cardiovascular death in these patients is 50 times higher than in non-transplant recipients.

4. According to the meta-analysis by Dew and colleagues, which psychosocial variable was not associated with medication nonadherence?

A. Nonwhite ethnicity  
B. Poor social support  
C. Poor perceived health  
D. Older age***

Correct answer: D  
Rationale (Objective 1): Dew and colleagues found that 3 psychosocial variables were associated with immunosuppressant nonadherence: nonwhite ethnicity, poor social support, and poor perceived health. Poor social support and poor perceived health had more robust associations with nonadherence than did nonwhite ethnicity.

5. According to the meta-analysis by Butler and colleagues, the risk for graft failure was how much higher for patients with nonadherence than for patients with adherence to their immunosuppressants?

A. 3 times  
B. 6 times  
C. 7 times***  
D. They were not more likely to experience graft failure

Correct answer: C  
Rationale (Objective 2): Butler and colleagues found that nonadherence significantly contributes to graft loss, and they reported that 36% of graft loss was associated with prior nonadherence. This increased the risk of graft failure and loss to a rate that was 7 times higher than the rate for patients who were adherent to their medications.
6. According to data reported by Terebelo and Markell, what percentage of patients was likely to be adherent to their immunosuppressant medications but nonadherent to their non-immunosuppressive medications?

   A. 30.6%***
   B. 22.6%
   C. 13%
   D. 43%

Correct answer: A
Rationale (Objective 1): Terebelo and Markell found that 18.4% of patients were nonadherent to immunosuppressants and 44.9% of patients were nonadherent to antihypertensive, antidiabetic, and/or lipid-lowering agents. A compelling finding was that 30.6% of patients who were nonadherent to their non-immunosuppressants were adherent to their immunosuppressants.

7. According to Medicare claims data, how much costlier are overall health care expenses for patients with low adherence than for patients with high adherence?

   A. $7,253
   B. $12,840***
   C. $3,379
   D. $8,926

Correct answer: B
Rationale (Objective 2): Medicare claims data reveal that patients with persistently low adherence had overall health care costs that were, on average, $12,840 higher than costs for patients with persistently high adherence; persistent nonadherence increased adjusted medical costs by $7253 over a 3-year time period.

8. African American patients have higher rates of graft failure than Caucasians. Taber and colleagues reported that this was potentially due to what factor?

   A. Diabetes
   B. Hypertension
   C. Deceased donors
   D. Cardiovascular disease***

Correct answer: D
Rationale (Objective 3): Taber and colleagues found that African Americans were more likely than Caucasians to be prescribed antihypertensives and lipid-lowering therapy, but African Americans had lower rates of adherence, according to medication possession ratios for
antihypertensives, insulin, and statins. In risk models, cardiovascular disease and cardiovascular risk factors contributed to a significant portion of the difference in the risk of death after transplant in African Americans compared to Caucasians.

9. Steroids are associated with several adverse effects. Which of the following is a commonly reported adverse effect of high-dose steroids?

A. Nephrotoxicity
B. Diarrhea
C. Mood instability***
D. Hypercholesterolemia

Correct answer: C
Rationale (Objective 4): Common adverse effects of steroids that are seen with chronically high doses include mood instability, hyperglycemia, fluid retention, weight gain, and increased appetite.

10. Migliozzi and colleagues reported on the use of a collaborative practice agreement to manage what cardiovascular risk factor after transplant?

A. Blood pressure***
B. Blood glucose
C. Cholesterol
D. Infection prophylaxis

Correct answer: A
Rationale (Objective 5): In order to manage blood pressure after transplant, a team of pharmacists at Rhode Island Hospital established a collaborative care practice agreement for home blood pressure monitoring and antihypertensive therapy adjustment. The group identified 84 patients for the service, and pharmacist interventions were able to significantly reduce average systolic and diastolic blood pressures to clinically meaningful margins at 30, 90, 180, and 360 days compared to baseline blood pressures.