Temozolomide is a targeted therapy that inhibits mammalian target of rapamycin (mTOR), a central regulator of tumor cell responses to growth stimuli. Temozolomide has a broad anticancer activity profile that impacts tumor cell growth, proliferation, and survival through its specific inhibition of mTOR. In a randomized phase III trial that enrolled previously untreated patients with advanced renal cell carcinoma (RCC) and poor prognostic features, temsirolimus significantly prolonged overall survival compared with interferon-α, a standard therapy (p = 0.008). Because of the results, temsirolimus was approved by the U.S. Food and Drug Administration for treatment and is considered a first-line treatment for patients with advanced RCC with poor prognostic features. Temozolomide is administered at a flat weekly IV dose of 25 mg given over 30–60 minutes. Gastrointestinal disorders (stomatitis, anorexia, nausea, diarrhea, and vomiting), rash, fatigue, edema, infections, and dyspnea, as well as hematologic and metabolic laboratory abnormalities occur in patients receiving temsirolimus. Metabolic side effects include hyperglycemia, hypercholesterolemia, hypertriglyceridemia, and hypophosphatemia. Most adverse reactions associated with temsirolimus can be managed medically or addressed by supportive measures. Nurses can improve patient outcomes through early recognition of side effects and prompt interventions.

At a Glance
- Temozolomide is an anticancer agent that inhibits mammalian target of rapamycin, a central regulator of tumor growth and angiogenesis.
- Temozolomide is the first targeted therapy to show survival benefits in patients with renal cell carcinoma and can be considered first-line treatment for advanced renal cell carcinoma with poor prognostic features.
- Oncology nurses have varied and important roles in optimizing patient outcomes with temsirolimus therapy, such as patient education, safe administration, and the recognition and management of side effects.