

# Tumor Lysis Syndrome: Prevention and Detection to Enhance Patient Safety

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Patient safety is at the forefront of health care and nursing practice. Oncology nurses strive to provide safe oncologic care in their management of cancer, treatments, and side effects. Oncologic emergencies such as tumor lysis syndrome (TLS), however, are serious complications of cancer and cancer treatment. TLS often is seen in hematologic malignancies, such as lymphomas and leukemias, that frequently occur in older adults. As the population in the United States continues to age, nurses must be prepared to manage oncologic emergencies in older adults. Understanding the risk factors and preventive strategies for TLS provides oncology nurses with a foundation for managing a serious treatment complication. Patients and their caregivers need to understand the importance of preventive measures for TLS; therefore, patient education must be a critical part of the oncology nurse's plan of care.

As the population continues to age, the incidence and risk of older adult patients developing cancer greatly increases. About 25% of new cancer diagnoses occur in those aged 65–74 years, whereas an additional 22% occur in those aged 75–84 years (Hanson & Muss, 2010). Statistics show that 60% of cancers and 70% of cancer deaths occur in patients older than age 65 (Bond, 2010). Leukemia and lymphoma diagnoses are among the less common but often highly morbid malignancies of later life. In recognizing the statistics, nurses face the challenge of providing care to patients aged 65 and older who likely have other comorbidities that must be taken into consideration during their cancer treatment. Oncologic emergencies, particularly with hematologic malignancies such as tumor lysis syndrome (TLS), are serious complications of cancer treatment. TLS, if not prevented or effectively treated, can be fatal.

## Case Study

Mr. F, age 70, was diagnosed with myelodysplastic syndrome (MDS) two years ago. He developed acute myelogenous leukemia (AML) about one year later. He was treated with chemotherapy and, after a prolonged blood count recovery, he returned to his baseline MDS. However,

several months later, Mr. F developed thrombocytopenia and was found (via a bone marrow biopsy) to have a relapse of his AML. He was admitted to the hospital with recurrent AML for chemotherapy. His other medical conditions included coronary artery disease and hypertension. His past surgical history included three coronary artery bypass graft surgeries, appendectomy, cholecystectomy, and left knee surgery.

On admission to the hospital, Mr. F presented with fatigue and an elevated creatinine of 1.24 mg/dl. His laboratory studies revealed a white blood cell count of 32,700 U/L, hemoglobin of 8.6 g/dl, hematocrit at 25%, and platelets at 14,000 U/L. Following a transfusion of platelets and blood, his physicians decided to begin chemotherapy treatment. IV fluids and oral allopurinol were initiated for several days prior to chemotherapy administration in an attempt to prevent or minimize TLS.

Despite those preventive strategies, Mr. F experienced asymptomatic TLS,

which was detected by abnormalities in his blood chemistry. Laboratory studies before, during, and after chemotherapy are shown in Table 1. Treatment interventions included monitoring his serum electrolytes and renal function every six hours. Mr. F was placed on telemetry for arrhythmia monitoring and treated with IV insulin-glucose therapy and sodium polystyrene sulfonate for hyperkalemia. Aluminum antacids were prescribed for treatment of hyperphosphatemia, and he continued to receive IV hydration and daily allopurinol for hyperuricemia.

Mr. F was closely monitored through oral intake and output measures, daily weights, and physical assessment for fluid overload. In addition, he received intermittent IV furosemide. Mr. F and his family received education about TLS through verbal communication with the primary nurse; his understanding was evaluated based on verbal discussion with his nurse. Fortunately, his condition gradually improved in about seven days. Mr. F recovered completely from TLS

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