

Southeastern Network 6 Kidney Council, Inc.

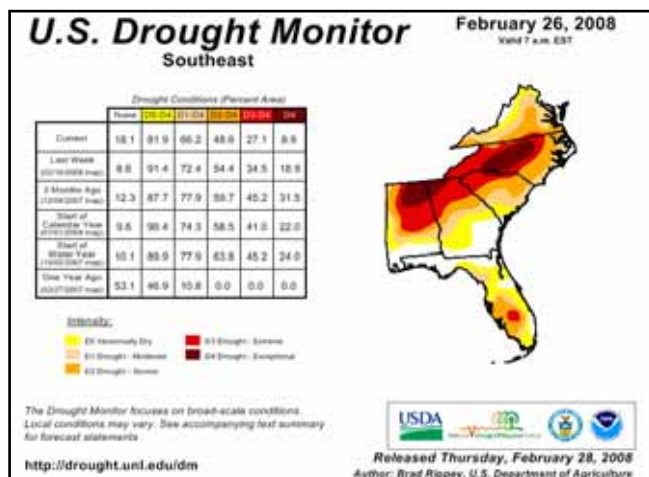
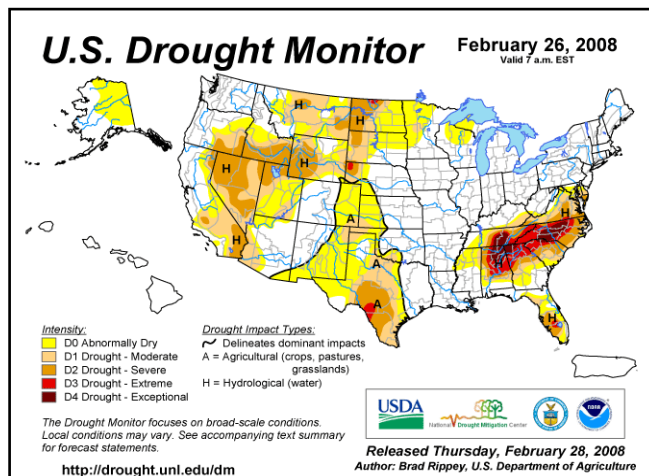
TO: All Dialysis Facility Personnel

FROM: Leighann Sauls RN, CDN
Director, Quality Improvement

DATE: February 29, 2008

RE: Drought Guidance Information Sheet

The Southeast region of the United States is experiencing severe to exceptional drought conditions (see U.S. Drought Monitor images below). To view the most up-to-date images, visit www.drought.unl.edu/dm/monitor.html. The Southeastern Kidney Council (ESRD Network 6), the Georgia Division of Public Health and the North Carolina Division of Public Health have collaborated to produce the following informational sheet regarding public health drought guidance for dialysis providers. This information should be utilized by dialysis facilities as a guide and reminder of potential water quality and associated health issues. If you have any questions related to this information, contact me at (919) 855-0882, ext. 26.



The mission of the Southeastern Kidney Council is to improve the lives of people with or at risk for End Stage Renal Disease by promoting and advancing quality of care

Drought and Dialysis: Potential Water Quality and Health Issues
Public Health Drought Guidance for Dialysis Providers

Prepared by
**The Georgia Division of Public Health,
The North Carolina Division of Public Health, and
The Southeastern Kidney Council, Inc.**

Hemodialysis patients are particularly vulnerable to contaminants in the water used to prepare concentrate and dialysate, or in water used for reprocessing dialyzers. Compared to healthy individuals, hemodialysis patients are exposed to extremely large volumes of water, have inadequate barriers to such toxins, and cannot easily eliminate contaminants. The estimated water intake of a healthy individual is 2 liters per day or 14 liters per week. By comparison, a hemodialysis patient may be exposed to 350 to 500 liters of water per week, depending upon their treatment time and dialysate flow rate.

Public water supplies may contain a variety of contaminants that are toxic to hemodialysis patients (see table below). These contaminants may arise from the source water used by a municipality, or they may be added during treatment of the source water to make it potable. Adverse events arising from contaminants in source water are rare. Water used for dialysis is highly filtered at each dialysis unit.

In the United States, for example, the Safe Drinking Water Act ensures that drinking water is nontoxic. However, during drought conditions, when the water levels in reservoirs, rivers and wells are low, water quality may be affected. Slight changes in drinking water quality that are well within the federal standards may impact the health of susceptible populations such as dialysis patients. Perhaps surprisingly, the contaminants that have proven most toxic to hemodialysis patients do not come from the source water itself but are substances added to water for protection of public health. These include aluminum, chloramines and fluoride.

Water Contaminants of Concern for Hemodialysis Patients	
CONTAMINANT	SYMPTOMS OF TOXICITY
Aluminum	Neurological deterioration, encephalopathy, bone disease
Calcium	Nausea and vomiting, muscle weakness, hypertension
Chloramines	Hemolysis, anemia, methemoglobinemia
Copper	Nausea, chills, hemolysis
Fluoride	Bone disease (chronic exposure); pruritus, chest pain, nausea, cardiac arrest (acute exposure to high concentrations)
Magnesium	Nausea and vomiting, muscle weakness
Nitrates	Nausea and vomiting, hypotension, methemoglobinemia
Sodium	Hypertension
Sulfate	Nausea and vomiting, metabolic acidosis
Zinc	Anemia
Bacteria and endotoxin	Pyrogenic reaction, such as hypotension, fever, nausea and vomiting

Reference: Richard A. Ward, Ph.D., Professor of Medicine, University of Louisville,
found at <http://patients.uptodate.com/topic.asp?file=dialysis/24924>

Recommendations and Reminders:

1. Monitoring of water quality in the dialysis unit is even more important during drought conditions than it is normally.
2. Be aware of potential changes in public drinking water supplies associated with drought conditions. Due to low water levels, the following changes may occur:
 - Source water changes may include changes in background levels of nitrates, calcium, copper and other constituents.
 - Treated public drinking water changes may include increases in aluminum, chloramines, and other constituents.
 - A potential increase in concentrations of the chloramines and other substances may accelerate depletion of disposables in the dialysis center's water treatment system (carbon filters, water softeners and reverse osmosis membranes).
3. Establish a contact at the local water processing facility for information concerning drought-related changes in source water or treatment processes.
4. Monitor any changes in normal day-to-day patient health patterns and report any usual problems to the local public health agency.
5. Inform home dialysis patients of the need to continue contact with their local water supply source if they are on a public water supply system.