

CHAPTER SIX

Dehydration: Water, Water Everywhere and Not a Drop to Drink



NOVEMBER 4-5, 2000

Jill took Mom's sister, Leona, to see Mom before I transferred Mom to the new nursing home in Traverse City on November 6. When she and Leona arrived at Alpine Manor at about 11:00 a.m. on Saturday, November 4, Mom was in bed asleep. They were unable to wake her, so they decided to go out to lunch and come back later. When they came back at about 1:30 p.m., Mom was still in bed and asleep. They did not wake her.

The following day, Jill and Leona again went to see Mom at about 11:00 a.m. Once again, she was in bed asleep. They roused her and talked to her for a while and Mom seemed to recognize Leona at the end of the bed. The nurses told Jill that Mom had been in bed since Friday and that she had had nothing to eat or drink in all that time.

After Jill's call on November 5, I telephoned Alpine Manor and requested that they hydrate Mom because I was worried she would be too dehydrated to survive the trip. I did not know that Alpine Manor was not equipped for and had no staff trained or available to insert an IV for simple hydration. I was told that the nurse would check with a doctor and would call me back.

The medical records for that last weekend contain contradictory information. They show that the nurse I spoke with told me that Mom was eating and drinking 100% that was offered and fluids were being offered every hour. Her nursing notes also show that she told one of the staff doctors the same thing and also told him that Mom was alert and responsive. The doctor did not order hydration. The nurse later talked to Jill and was able to convince Jill that nothing needed to be done.

Notes in Mom's records written by other health care workers and a staff doctor show that Mom was "in bed sleeping" from Friday through Monday morning, that she was not responding to verbal or non-verbal cues, and that her

Dehydration: Water, Water Everywhere and Not a Drop to Drink

lips were dry and cracked, a sign of dehydration. One nurse noted, “Staff report not taking fluids.” In fact, a staff doctor was called to Mom’s bedside twice during the weekend and it is obvious from his notes that he thought Mom was dying. This doctor diagnosed Mom with delirium and a “probable urinary tract infection.” He ordered an antibiotic and discontinued the antipsychotic. He ordered lab tests for Monday. Neither he nor the facility notified me or my sisters that Mom’s condition had changed for the worse.

On Sunday the doctor saw Mom again. He noted her electrolyte imbalance as a cause for her delirium. Unfortunately, his diagnosis of dehydration and delirium was not made a part of the discharge documents transmitted to the Traverse City nursing home. The lab test results from that day were not included either. As a result, when Mom arrived in Traverse City, her working diagnosis, in the words of the Alpine Manor medical director, was “general debilitation secondary to pelvic fracture.” No one in Traverse City was expecting delirium, dehydration, or malnutrition.



Dehydration: The Most Common Fluid and Electrolyte Disorder

You may be surprised to learn that dehydration is epidemic among the elderly population, both in long-term care settings and in home-dwelling elders. Because it is difficult to detect in its early stages and is likewise difficult to treat, dehydration must be prevented. You may find this difficult if your loved one has never developed a habit of drinking water or if she is quite frail and less mobile, but there are tools and skills you can use so that you can alert her doctor that diagnosis and treatment is necessary.

There are three kinds of dehydration. Each has different causes, each requires a different type of treatment, and each poses a serious threat to your loved one.

Chart A: Three Kinds of Dehydration

TYPE	PROCESS	CAUSE	OSMOLALLITY
Isotonic	Balanced loss of water and sodium	Vomiting, diarrhea	Normal (285-295 mOsm/kg)
Hypertonic	Water losses exceed sodium losses	Fever	Increased (>300 mOsm/kg)
Hypotonic	Sodium losses exceed water losses	Overuse of diuretics	Decreased (<250mOsm/kg)

Taking Charge

Nursing homes are required by federal law to meet residents' nutrition and hydration needs. If your loved one lives in a nursing home—even temporarily during rehabilitation following surgery or hospitalization—you will want to review these requirements in the endnotes and make sure that the staff caring for your loved one is complying with them.¹ Make no assumptions, because as my family learned, just because it's required does not mean that it's happening.

Nursing homes are required to maintain good nutrition and hydration if one of three situations prevails: (1) an existing disease process (such as terminal cancer) progresses and interferes with adequate nutrition and hydration, (2) the resident develops a new disease process in addition to the original diagnosis and it causes malnutrition and dehydration, or (3) the resident refuses food and water. If an existing disease or a new diagnosis places a resident at risk for malnutrition and dehydration, nursing homes must provide appropriate nutrition and hydration services² so that the resident may “attain and maintain the highest practicable physical, mental, and psychosocial well-being.” This means nursing home staff must assist a resident who can no longer lift a fork, spoon, or glass to her mouth, and if a resident refuses food because she is depressed, the facility is required by law to assess the condition and provide appropriate treatment and services.

Despite federal oversight, dehydration is common in the frail elderly who live in long-term care settings. It is also common among the elderly who live in the community. In fact, the elderly aged 85 to 99 are six times³ as likely to suffer dehydration as those aged 65 to 69.⁴ Those most at risk have multiple chronic illnesses, take many dosages and/or kinds of medications, and/or have a debilitated functional status, making fluid intake difficult.⁵

Serious Consequences of Dehydration

Dehydration places the elderly at high risk of serious consequences, including the onset or worsening of delirium, disorientation, confusion, bedsores (decubitus ulcers), urinary tract infections, pneumonia, and constipation. Respiratory illness, metabolic imbalances, kidney stone formation, mitral valve prolapse, some kinds of cancer, and gastroenteritis are other conditions that can either be brought on by or exacerbated by dehydration.⁶ Dehydration may also interfere with diabetes control.

Dehydration: Water, Water Everywhere and Not a Drop to Drink

More seriously, dehydration impairs kidney function and puts the patient at risk for serious consequences such as kidney failure and drug toxicity. Most drugs are excreted through the kidneys. When the kidneys fail to work properly, those drugs will remain in the bloodstream and may reach toxic levels. This is a critical problem in a frail elder who is being given many different medications. To avoid toxicity, two things should occur. First, a dehydrated patient's medications should be reduced. Second, the dehydration must be treated appropriately. Neither of these occurred with Mom. In fact, I learned that a cause of her death was "toxic encephalopathy"—brain death due to toxins. In layperson's language, Mom was poisoned by her own medicines.

Ultimately, untreated dehydration can lead to electrolyte imbalance, shock, convulsions, coma, and death. Fully 50% of those hospitalized with dehydration as the primary diagnosis will die within one year. Of those, more than 18% will die within a month of admission.⁷

To assist your loved one's caregivers in avoidance and early detection of dehydration, you will need to know the risk factors that make your loved one susceptible to it. Then you need to be aware of how to detect dehydration, how it is treated and, most importantly, how you can intervene to prevent dehydration from affecting your loved one.

There are four keys to avoiding dehydration:

- Recognizing the at-risk patient
- Observing the at-risk patient closely to detect any possible causes of dehydration
- Working with your loved one's physician to treat the factors that put her at risk for dehydration.
- Preventing dehydration in the first place

Recognizing the At-Risk Elderly Patient

To detect dehydration early, you must be aware of whether your loved one is at risk and what factors make her vulnerable to dehydration. If your loved one has any of the risk factors described below, this will compound the problem of prevention. Recognition of these risk factors is key to critical early diagnosis and treatment of dehydration. Recognition is also an important key to prevention. The factors that make your loved one at risk for dehydration include:

Taking Charge

ADVANCED AGE

Ideally, as fluids are taken in through the mouth and excreted in various ways, including sweating, respiration, and in the urine and feces, the human body maintains a proper balance of fluids. But knowing certain facts that apply to all elderly persons can help you prevent dehydration in your elderly loved one. As people age, their kidneys have a decreased ability to concentrate urine and the body does not conserve water as well. Since older people are less likely to experience thirst, this presents a potentially serious problem since increased thirst is normally the major defense against dehydration. By the time your loved one realizes she is thirsty, she is already dehydrated.

If your loved one is like many elderly persons, she doesn't have a life-long habit of drinking fluids and her intake has typically been substandard. As is common in the elderly, she finds maintaining a balance difficult because of age-related changes in how she metabolizes water.⁸

Advanced Age is a Risk Factor for the Elderly

Dehydration is common in the frail elderly whether they live in long-term care settings or in their own homes or the home of a family caregiver. The elderly aged 85 to 99 are six times as likely to become dehydrated as those aged 65 to 69.

INCREASED FLUID LOSSES DUE TO ILLNESS

Many illnesses result in fluid losses and lead to dehydration, including the following:

- A urinary tract infection in the previous 30 days
- Fever
- Diarrhea
- Sweating
- Internal bleeding
- Previous episodes of dehydration
- Vomiting

It is essential that fluids lost because of these conditions be replaced.

Dehydration: Water, Water Everywhere and Not a Drop to Drink

MEDICATION SIDE EFFECTS

Many medications can put the elderly at risk for dehydration because their side effects, such as drowsiness or loss of appetite, cause a decrease in fluid intake. If your loved one takes numerous medications, she may be more at risk for dehydration.

A side effect of some medications is anorexia (loss of appetite). Antipsychotics may cause your loved one to become dehydrated because they cause sedation. If your loved one's medications cause her to be sleepy, she may simply forget to drink fluids. Also, some of her fluid intake occurs as she eats since many foods contain significant fluid. If your loved one decreases her food intake, her fluid intake will also be reduced.

You will want to check to see whether any of your loved one's medications can cause dysphagia—difficulty in swallowing. Researchers find that many elderly persons suffer from undiagnosed dysphagia. Other medications cause delirium, the mental confusion you learned about in Chapter Two, and dystonia, a side effect discussed in Chapter Four. All of these conditions will make it difficult for your loved one to drink. You'll find many helpful tools in the appendices to help you keep track of her medications and their side effects.

DECREASED FLUID INTAKE

The recommended amount of fluids is between 30 to 35 mL/kg per day, or six to eight eight-ounce glasses.⁹ If your loved one is fearful of urinary incontinence, she may purposefully restrict fluids to avoid having “an accident” when she has to rush to the toilet. Unless she consumes at least 75% of the recommended amount of fluids, she is at risk for dehydration. In a 1999 study, Burger found that only one in 40 nursing home residents observed drank sufficient fluids.¹⁰

CONFUSION AND LOSS OF MOBILITY

If your loved one is confused or suffers from dementia or delirium, she is at risk for dehydration, because she will often fail to recognize thirst and/or adequately care for her hydration needs. If she suffers a loss of mobility or has problems with dizziness or vertigo, she is as much at risk for dehydration as one who has comprehension or communication problems. She may fail to drink adequate fluids because she is afraid of falling and thus does not get up independently to get herself a drink of water.

Taking Charge

INABILITY TO FEED ONESELF

Many foods contain significant amounts of fluid. Your loved one takes in water in foods such as soups, broths, fruits, and Jell-O. If she finds it impossible to feed herself and if she is dependent upon aides at meals, she is at far greater risk for dehydration. As Burger and her colleagues discovered, understaffing in nursing homes leads to inadequate and/or ineffective feeding for many of these functionally impaired persons. (Understaffing is covered in detail in Chapter Eight.) If your loved one has hand dexterity problems or body control problems, is bed-bound, has swallowing problems or dysphagia, or requires intravenous fluids, she is at risk for dehydration as a result of an impaired ability to feed herself.

Your loved one is also very vulnerable to dehydration if she must be fed by an aide. Keeping in mind that it takes 30 to 60 minutes to feed a person safely and efficiently, it becomes quite clear that there are often too few staff members available in nursing homes to enable all the residents to receive the assistance in eating they require.¹¹

ADDITIONAL RISK FACTORS

Additional risk factors for dehydration include illnesses that are accompanied by vomiting, fever, or diarrhea because fluids are lost from the body as a result. Other risk factors include eating poorly (25% of food left uneaten at most meals), failure to take medication(s), or rapid weight loss. According to Burger, physicians writing for the American Medical Association consider a rapid weight loss of greater than three% in a 28-day period to be a trigger for evaluation of dehydration.¹²

Detecting Dehydration

Early detection of dehydration depends on careful monitoring of nutritional intake, both food and fluids, which should be reviewed on a daily basis. If your loved one consistently takes in fluids of 1500 cc (about six to eight cups) or less each day, you should be especially alert to the potential for dehydration. Dehydration in an older person is not easily recognized, particularly in the early stages, but there are ways you can help detect it in your loved one so that you can seek prompt intervention.

Dehydration: Water, Water Everywhere and Not a Drop to Drink

OBSERVABLE SIGNS

Dizziness and irregular heartbeat as well as constipation, lethargy, delirium, and confusion can be caused by dehydration and thus may be indicators of dehydration. Other early signs and symptoms of dehydration include headache, fatigue, and heat intolerance. Dryness in the mouth or eyes is another sign.

While urine color darkens as dehydration develops because it becomes concentrated, this is not a sensitive indicator for early dehydration. By the time your loved one has concentrated urine, she is probably already in the later stages of dehydration.

Weight loss is another indicator of dehydration. One pound of body weight is equal to 455 mL of water; a weight loss of three pounds is an indicator of dehydration. (Three pounds is equal to 1365 mL. This is about eight cups or one-half gallon and is the amount of fluids an adult should drink each day.)

Observable Signs and Symptoms of Dehydration

- Dizziness
- Irregular heartbeat
- Constipation
- Lethargy
- Delirium
- Confusion
- Weight loss (> 3% in 28 days)
- Headache
- Fatigue
- Heat intolerance
- Dryness in the mouth or eyes

LABORATORY TESTS

Laboratory test results can help make a diagnosis of dehydration. Keep in mind that because abnormal values are “normal” for some people, it is important to look for changes in values.

Electrolyte imbalance. Monitoring electrolyte imbalance is critical in detecting dehydration in your loved one.¹³ Do not, as I did, underestimate the serious threat this poses for her. If electrolytes are not perfectly balanced in the body, many organs, including the heart, cannot function

Taking Charge

properly. If you've ever watched college football on TV, you'll remember that athletes consume large quantities of Gatorade. This is a fluid that is specially formulated to prevent electrolyte imbalances from occurring as the players lose copious fluids through perspiration during their play, particularly on hot days. In fact, on very hot days, when electrolyte imbalances may occur, you may remember seeing players suffering muscle cramps or spasms so intense they limped from the field, not to return until after fluid replacements. I've even seen games on very hot days where the TV commentators reported that some players were taken to the locker room and given intravenous fluids! Electrolyte imbalances are a very serious problem indeed. Keep in mind that if your loved one develops an electrolyte imbalance and it remains untreated, her condition will be fatal.

I knew nothing about electrolyte imbalance before Mom died. I've since learned that her electrolyte imbalance, diagnosed but never treated, was the precipitating factor in all of the complications that led to her death. The following explanation is intended to help you avoid a similar occurrence in your loved one. [Details more harrowing and complicated are found in endnote 15 for this chapter.]

Alpine Manor had written on Mom's few records sent to the Traverse City facility that she had an electrolyte disorder. This didn't mean anything to me, and Alpine Manor's staff did not seem concerned about it. They never mentioned it when I asked them about the drastic changes in Mom's condition, nor did they mention it when I picked Mom up to take her to Traverse City. One piece of paper had hand-written lab test results, but no one noticed that these results were from October 13 instead of November 6. We all knew that Alpine Manor had done tests on November 6 just before the transfer, and we assumed those were the test results we were given. Mom's internist in mid-Michigan noted the electrolyte imbalance but did not seem overly concerned, so I had no idea this was a life-threatening condition.

After Mom's death, I found a diagnosis of acute electrolyte imbalance in her discharge record and autopsy report.¹⁴ As I researched electrolyte imbalance, the term "osmolality" appeared. Osmolality is the concentration of particles of electrolytes in solution and is determined by examining the fluid portion of a blood sample in the lab. Osmolality increases with dehydration (the number of particles increases) and decreases with over-hydration. It is determined by measuring the ratio of sodium, potassium, urea, and glucose.

Physicians use a complicated mathematical formula to make this determination, but you don't need to be a doctor or nurse to monitor your loved

Dehydration: Water, Water Everywhere and Not a Drop to Drink

one's status. To help you detect dehydration in its early stages so that you can alert physicians and nurses that treatment is needed, you simply need to keep track of the lab tests your loved one has, tests her physician will call "an electrolyte panel." Keep a chart with the lab values for sodium (Na), Potassium (K), urea (BUN), and glucose. You can plug these values into a calculator on an Internet website to determine her osmolality. This calculator is found at www.intmed.mcw.edu/clincalc/osmol.html. If the calculation you make exceeds the normal range (normal osmolality is 285 to 295),¹⁵ you should contact her physician's office immediately.

Although there are other simpler ways to detect dehydration, which will be discussed below, calculating osmolality provides a more accurate assessment for those who are able to use this method of detecting dehydration.

Kidney function. Monitoring kidney function is critical to the detection and management of dehydration and can be done in several ways. Perhaps the easiest way is to look at BUN and serum creatinine levels. According to Dr. John E. Morley, a ratio greater than 20:1 is highly suggestive of dehydration.¹⁶ If regular lab tests are available for your loved one, BUN and serum creatinine levels will be readily available to you. Divide the value for BUN that you find on your loved one's lab tests by the value you find for serum creatinine (SCr). If the number you get is greater than 20, call her doctor right away.

Another way you can monitor kidney function is to calculate creatinine clearance.¹⁷ While it is possible for physicians to get a lab test to determine creatinine clearance, the test usually takes 24 hours. It is important to detect kidney failure quickly, so physicians often use a formula to estimate creatinine clearance. In other words, they measure how effectively the kidneys are filtering out creatinine, which tells them how well the kidneys are functioning. Although this is a somewhat complicated matter, you don't need to know how or why it works. All you need to do is plug a few numbers—values from your loved one's most recent lab tests—into a different online calculator. If the calculator indicates there is a problem, you will need to alert your loved one's physicians and nurses immediately because early detection and treatment is key to survival.

You will need to know your loved one's weight, age, and serum creatinine (SCr on her lab tests). Plug these numbers into the calculator at www.intmed.mcw.edu/clincalc/creatinine.html. If the number you get—the estimated creatinine clearance—is lower than 50 to 55, you should alert her medical team members right away.

What Does Low Creatinine Clearance Mean?

Impaired creatinine clearance is indicative of the following:

- Kidney damage due to drug toxicity
- Damage to the structure of the kidney, which will lead to kidney failure
- Dehydration
- Congestive heart failure
- Obstruction of urine in the kidney
- Shock
- Acute or chronic kidney failure
- End-stage renal disease

Because a failure to treat these conditions will lead to death, it is important that kidney function be monitored, that drug dosages be decreased or eliminated in the event of an impairment in kidney function, and that aggressive treatment of the underlying condition be promptly initiated.

According to Joel Shuster, professor of clinical pharmacy at Temple University School of Pharmacy, normal kidney function for most elderly persons is a glomerular filtration rate (GFR) of 50-55 to 70-75 mL/min.¹⁸ (85-125 mL/min is normal for a young adult.) When kidneys are functioning below a GFR level of 10, a person needs dialysis to remove toxins from the blood and to permit life to continue. According to Shuster, when your loved one's GFR is below 50, her medications must be thoroughly evaluated and reduced to avoid the risk for toxicity that can be fatal. If you find information that your loved one's kidney function is faltering, it is very appropriate and necessary for you to ask her physician whether she might reduce or eliminate some medications, particularly those with side effects that might have had a negative impact on your loved one's kidney function.

Use the tools in Appendix L to keep track of your loved one's BUN to creatinine ratio and also her GFR.

Weight loss. As mentioned above, you should consider a weight loss of three% as a trigger for considering the possibility of dehydration. Weight loss may be one of the easiest things to monitor if you are able to make sure your loved one is weighed consistently on a weekly basis (or more frequently if her status is very fragile). Be aware that experts consider this the least reliable method.

Dehydration: Water, Water Everywhere and Not a Drop to Drink

One other method sometimes used involves lifting a pinch of skin on the patient's arm using your thumb and forefinger to examine elasticity. I remember clearly that when Mom and I were in Dr. Scott's office just before we left for Traverse City, I expressed concern that Mom was dehydrated. Dr. Scott's nurse did this skin test and assured me that Mom was not dehydrated. It was long after Mom's death that I learned about osmolality and realized how critically dehydrated she was on that day. I can tell you from personal experience not to trust this very unscientific and subjective method of detecting dehydration.

Treating Dehydration

If your loved one develops dehydration, you will need to understand the various kinds of treatment. As shown in Chart A at the beginning of this chapter, there are three kinds of dehydration, so treatment will depend upon which type of dehydration your loved one has.

ISOTONIC DEHYDRATION

Isotonic dehydration is due to a balanced loss of water and sodium, typically resulting from total abstinence of food and water or a large volume loss from diarrhea or vomiting. Electrolyte concentrations remain near normal. Loss of volume without electrolyte disturbance constitutes the simplest type of dehydration. In this case, treatment consists of replacing the volume deficit over 24 hours.

HYPERTONIC DEHYDRATION

In hypertonia, loss of water is greater than loss of sodium. Fever can precipitate hypertonia, although excess sweating may also cause this condition. Signs of hypertonia include warm, doughy, velvety skin, dry mucous membranes, muscular signs such as twitching and hyperreflexia (an exaggeration of reflexes), and central nervous system symptoms such as lethargy, confusion, irritability, rigidity, generalized convulsions, and finally, coma. To treat hypertonia, the serum sodium concentration must be corrected slowly over at least 48 hours.

The goal is to avoid dropping the sodium too quickly. It is not unusual for total body sodium to be below normal, and this must be corrected as well.

Taking Charge

HYPOTONIC DEHYDRATION

Hypotonic dehydration is defined as sodium loss exceeding water loss. This type of fluid disturbance is most often due to use of diuretics. Hypotonic dehydration primarily affects the central nervous system (CNS) and musculoskeletal systems. CNS effects include headache, fatigue, anorexia, lethargy, confusion, disorientation, agitation, vomiting, seizures, and coma. Musculoskeletal symptoms may include cramps and weakness. Hyponatremia is fairly severe if these symptoms are present.

If your loved one is hypotonic, diuretics should be discontinued and fluid replacement should be carefully initiated. Hypertonicity must be corrected slowly, for she may be harmed if fluids are introduced too quickly. If, however, she is displaying signs of central nervous system (CNS) involvement or is experiencing seizures, a partial correction of the sodium deficit can be achieved rapidly. The danger of drug toxicity is serious.

Your loved one should receive intravenous fluids as soon as possible after a diagnosis of dehydration. One method that can be used at home or in nursing homes is subcutaneous infusion, which means injecting fluids under the skin in a place with lots of skin area, usually the stomach or thighs.¹⁹ Since this method does not require an IV, which may not be available in nursing homes that do not offer skilled care, its use may eliminate the need for hospitalization.

Since a large amount of fluids are provided by food, if your loved one is dehydrated, you may have to address whether tube feeding is required. This is a difficult question and one that many families wish to avoid, for once tube feeding is begun it is difficult if not impossible to make a decision to discontinue it. Tube feeding is discussed more fully in Chapters Seven and Nine.

Obviously, it is best to avoid dehydration altogether. This is most feasible if you or another family caregiver takes responsibility for consistently monitoring your loved one's condition.

Preventing Dehydration

To prevent dehydration, do the following:

ASSESSMENT

- Ask your loved one's physician to evaluate her medications, the specific medications and also the dosages, and to consider

Dehydration: Water, Water Everywhere and Not a Drop to Drink

reduction, substitution, or elimination of medications in light of her kidney function as determined by electrolyte or other testing or observable side effects that restrict her ability to take in fluids.

- Ask her physician to assess her in light of confusion or dementia to determine how capable your loved one is of providing herself with adequate liquids and of appreciating thirst and the need for fluid intake.
- You may need to have an occupational or physical therapist make an assessment of physical problems that can impact your loved one's ability to drink fluids. For example, if she has difficulty swallowing, a speech therapist should evaluate her swallowing function.

OBSERVATION

- Observe your loved one at mealtimes and when drinking if her intake is consistently poor to identify the problem and also to document intake.
- Learn your loved one's fluid preferences, communicate them to the staff, and offer fluids she prefers.

ASSISTANCE

- Make sure your loved one has access to fluids and do not rely on thirst to prompt fluid intake, because most elderly individuals perceive thirst poorly, if at all.
- Be aware of your loved one's physical limitations. You may need to offer physical assistance in drinking fluids or you may need to provide adaptive glasses or cups.
- Offer electrolyte-replacing solutions such as Gatorade instead of water if hyponatremia (dehydration with an electrolyte imbalance) is a problem. Try freezing one of these solutions into Popsicles for your loved one.
- Be attentive to the fluid requirements if your loved one is confused or delirious, for she will lack the ability to understand that she needs to drink fluids.
- If your loved one is at risk for aspiration pneumonia, fluids may need to be introduced in other ways. For example, applesauce, puddings, and Jell-O may be used for fluid intake if swallowing thin liquids is too difficult.

Taking Charge

- Thickett, a product that can be ordered without a prescription through a drug store, will enable you to thicken liquids and runny foods to a consistency that is easier for her to swallow.
- Find out what staff members will be alerted and available to help her. Follow up to make sure she is getting that help.

ENCOURAGEMENT

- Encourage fluid intake by offering ice chips, Popsicles, juice bars, gelatin, ice cream, sherbet, soup, broth, fruits, fruit and vegetable juices, lemonade, and flavored water.

SPECIAL CAUTIONS

- Offer supplemental fluids to your loved one if she is vomiting, has diarrhea, a fever, or is receiving diuretics, as she will be losing more fluids than normal.
- Remember that each degree of fever adds an additional 300 cc's daily to your loved one's fluid requirement.
- Avoid coffee and alcohol, which are diuretics.
- Do not use straws if your loved one has chewing and swallowing problems. Straws increase air swallowing and add to the number of steps required for drinking.

Because of dehydration's potentially fatal consequences, you will want to take an active role in helping your loved one's medical team watch for signs of it, do the assessments to detect it, and, most of all, to prevent it.

Endnotes

8. Id.; Siegler EL, et al., *supra*.
9. Thapa PB, et al., *supra*.
10. Id.
11. The GOOGLE search “urinary incontinence” pads “home delivery” yielded 1,140 hits on March 1, 2006. (Contrast with 290 hits on Nov. 8, 2004.)

CHAPTER SIX

1. Federal law requires nursing homes to make sure residents’ hydration needs are met. Specifically:
 - Each resident must be assessed as to the adequacy of her nutrient and fluid intake.
 - Each resident must have a care plan, updated whenever there is a change in status, to address any specific nutritional or fluid deficiencies.
 - The nutritional and fluid status of each resident must be supervised by sufficient nursing staff.
 - The dietary needs of each resident are to be supervised by the resident’s physician.
 - The resident must be provided with care and services required to maintain nutritional status. In other words, if necessary, assistance in eating and drinking must be given.
 - Each resident has the right to be free from physical and chemical restraints, which are known to decrease appetite and impede eating and fluid intake. Each resident is entitled to maintenance of her quality of life. This means facilities must ensure that each resident maintains “acceptable parameters of nutritional status, such as body weight and protein levels, unless the clinical condition demonstrates that this is not possible.” Similarly, hydration must be maintained.
 - Residents with nutritional problems must be provided therapeutic diets. This is because a large portion of fluid intake occurs through food intake.
2. General Accounting Office 1996, *supra*.
3. Wick JY. Prevention and management of dehydration. *Consult Pharm.* 1999 Aug;14(8). www.ascp.com/public/pubs/tcp/1999/aug/prevention.shtml.
4. Burger and her associates have written a long article about their view of the “silent epidemic,” focusing primarily on the dehydration, malnutrition, and significant understaffing perils endemic in U.S. nursing homes. Burger SJ, Kayser-Jones J, Prince J. Malnutrition and dehydration in nursing homes: Key issues in prevention and treatment. Commonwealth Fund. 2000 July; Pub No 386 www.nccnhr.org/pdf/burger_mal_386.pdf.
5. Lavizzo-Mourey R, et al., *supra*; Burger SJ, et al., *supra* (2000).
6. Wick JY, *supra*.
7. Id.

Endnotes

8. Kayser-Jones J, Schell E, Porter C, Paul S. Reliability of %age figures used to record the dietary intake of nursing home residents. *Nursing Home Medicine*. 1997;5(3):69–76.
9. Burger SJ, et al., supra (2000); Wick JY, supra.
10. Burger SJ, et al., supra (2000).
11. Id.; OBRA 1987 and OBRA 1990.
12. Burger SJ, et al., supra (2000); General Accounting Office 1996; Kidder SW, supra.
13. Electrolyte imbalance is an acute sodium and potassium imbalance that may cause cardiac arrest, kidney problems, or muscle spasms. Oral electrolytes are a simple solution of water, minerals, salts, and carbohydrates. They balance the body's need for sodium, chloride, and potassium salts. These and other minerals change in the body into electrically charged particles called ions.
14. I was able to use Mom's lab test results from her medical records and also the Internet calculator to determine her osmolality, which made it crystal clear that dehydration occurred, could and should have been detected by the staff at Alpine Manor, and most definitely should have been treated. I calculated Mom's osmolality at the beginning of her stay at Alpine Manor, finding that at 292, it was essentially normal. (Normal osmolality is 285 to 295.) Her osmolality calculated on October 10, about the time we noticed that Mom was again becoming delirious, was above normal (311), and the medical director noted in her records that Mom had an electrolyte imbalance. There was no evidence that this imbalance was treated. Another lab test was done on October 13 and the results (306) were still abnormal. But there was no lab work done to monitor her condition between October 13 and November 6, the day of her transfer.

On November 6, Alpine Manor again did lab tests, but inexplicably, they never gave them to me and they did not provide them to Mom's new doctor or nursing home. I obtained them many months after her death when I ordered copies of her medical records. Mom's osmolality on November 6 was 361, far above normal and a solid indicator of dehydration.

I also used the osmolality calculator on Mom's lab values for the date of November 13, when Mom was admitted to the hospital in multi-system failure. At 435 on that date, her osmolality was shocking. Later, on the Internet in a Continuing Medical Education segment for nurses, I found this statement:

Panic values for serum osmolality are values of less than 240 mOsm or greater than 321 mOsm. A serum of osmolality of 384 mOsm produces stupor. If the serum osmolality rises over 400 mOsm, the patient may have grand mal seizures. Values greater than 420 mOsm are fatal. [My emphasis]

This material can be found on the Rnceus Interactive web site at www.rnceus.com/renal/renalosmo.html, Last accessed March 1, 2006.

Endnotes

15. The formula is:
(2 x (Na + K)) + (BUN / 2.8) + (glucose / 18) for men.
(2 x (Na + K)) + (BUN / 2.8) + (glucose / 18) X 85 for women.
16. Kamel HK, Thomas DR, Morley JE. Nutritional deficiencies in long-term care: Part II Management of protein energy malnutrition and dehydration. *Annals of Long-Term Care Online*. 1998 July;6(7):250.
17. Creatinine is a waste substance easily filtered by the kidneys and eliminated in the urine of healthy people. Kidneys filter creatinine from the blood at a given rate. Thus, the level of creatinine equals the glomerular filtration rate (GFR), or the rate at which the kidneys process blood through the glomerular system. If the kidneys are not working well, creatinine will accumulate in the blood. Thus, the level of creatinine in the blood as indicated in lab test values is an indicator of how well the kidneys are functioning.
18. Normal GFR is 85-125 mL/min. But, as we've discussed, there is a definite decrease in renal function as the body ages. According to Joel Shuster, PharmD., normal for Mom would have been "around 50-55 to 70-75 mL/min" [Email August 6, 2002].
19. Kamel HK, Thomas DR, Morley JE, supra.

CHAPTER SEVEN

1. Morley JE, Thomas DR, Kamel H, supra.
2. Burger SJ, et al., supra (2000).
3. Id.
4. Remember when you see a statement like this that it means it encompasses all studies from the ones finding the lowest percentage to those finding the highest percentage of malnourished residents.
5. Fiatarone MA, O'Neill EF, Ryan ND, Clements KM, Solares GR, Nelson ME, Roberts SB, Kehayias JJ, Lipsitz LA, Evans WJ. Exercise training and nutritional supplementation for physical frailty in very elderly people. *N Engl J Med*. 1994 Jun 23;330(25):1769-75; Burger SJ, et al., supra (2000).
6. Id.
7. Demling RH, DeSanti I, supra. Technically, this is called destructive metabolism, or catabolism.
8. Id.
9. Id.
10. Morley JE, Silver AJ, supra (1995).
11. Cole C, Bigando K, DeSutter S. Is altered nutritional status the root cause of your clients' negative outcomes? *J Nurs Care Qual*. 2000 Jan;14(2):41-56.
12. Gunning K, Saffel-Shrier S, Shane-McWhorter L. Medication use and nutritional status in elderly patients receiving home care. *Consult Pharm*. 1998; 8:897-911. www.ascp.com/public/pubs/tcp/1998/aug/rr.shtml.