

# Fluid Intake and Hydration: Critical Indicators of Nursing Home Quality

*Robert J. Sullivan, Jr., MD, MPH*

After emerging from the primordial sea, humans evolved a sophisticated system for maintaining hydration in order to survive. Despite extremes of environmental stress, internal fluid and electrolyte balance remain remarkably stable. Compensatory mechanisms required to accomplish this feat begin with a sense of thirst, which stimulates fluid consumption.<sup>1</sup> With adequate fluid intake assured, the kidneys retain or discard fluids and electrolytes as appropriate. Under most circumstances, this remarkable mammalian adaptation to life on dry land requires no conscious intervention. In fact, the overwhelming majority of healthy children and adults pursue their daily affairs blissfully unaware of their hydration requirements, or their efforts to meet them.

Such is not the case for infirm elderly individuals. They experience a reduction in the ability to compensate for fluid excess and deficit due to a diminished sensation of thirst<sup>2</sup> coupled with a decline in kidney function. As a result of these changes, for the first time in their lives, older individuals and their caregivers must devote specific attention to fluid intake and elimination.<sup>3</sup> Since changes of aging are subtle, and often are ignored or pass unnoticed, it is not surprising that unrecognized chronic dehydration is a common finding among older adults presenting to emergency departments.<sup>4</sup>

Attention to fluid intake is particularly important for those living in nursing homes. Many of the reasons leading to nursing home placement are associated with significant hydration challenges. Residents with cerebral deterioration or injury may fail to respond to thirst stimuli or be unable to gain access to fluids. Renal function can be reduced by infection, diabetes, kidney stones, and urinary tract outflow obstruction. Medications administered to control illness can adversely influence bodily control systems. As a result of such challenges,

mechanisms that maintain hydration may prove inadequate. In response, nursing facility management must establish systems of care to provide ongoing hydration support, and staff must be trained to assume an active role in promoting fluid intake.<sup>5</sup> Failure to manage hydration can be life-threatening and is a common reason for hospitalization.<sup>5</sup> Fortunately, excellent reviews and guidance are available in the medical literature to guide both novice and experienced caregivers.<sup>6</sup>

## Initial Evaluation

Immediately upon arrival at a nursing facility, the staff should conduct a comprehensive assessment of the new resident's needs and capabilities. In regard to fluids and hydration, the assessment should document prior requirements for hydration assistance, physical limitations on swallowing, and underlying medical conditions and medications that could present problems. Direct observation during meals and throughout the first day will provide additional information regarding intake and elimination patterns and capabilities. An immediate plan of care must be established to address hydration whenever concerns or problems are documented. Virtually all information necessary to understand hydration requirements is addressed in the Minimum Data Set (MDS).<sup>\*</sup> With this information available, a care plan can be created to assure ongoing stability.

When determining fluid intake requirements, all sources of fluid gain and loss need to be considered. Residents exhale moisture with each breath, and their skin constantly exudes moisture that evaporates from the surface. They lose additional moisture through bowel evacuation and the production of urine as they eliminate waste products of metabolism. They gain some fluid through metabolism of foods, but it does not

\* "The Minimum Data Set (MDS) is part of the federally mandated process for clinical assessment of all residents in Medicare or Medicaid certified nursing homes. This process provides a comprehensive assessment of each resident's functional capabilities and helps nursing home staff identify health problems." For more information visit: The Centers for Medicare and Medicaid Services. MDS Quality Indicator and Resident Reports. Available at: <http://www.cms.hhs.gov/states/mdsreports/default.asp>.

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equal losses. Thus, a daily intake of at least two or more liters is necessary to sustain equilibrium.

While most residents can successfully continue self-management of fluid intake as they have done throughout their entire lives, the admission assessment is designed to detect risk factors for dehydration. Generic risk factors discovered from research studies include female gender, age over 85, more than four medical conditions, more than four medications, bedridden, laxative use, and chronic infections.<sup>8</sup> Specific risk factors include fluid loss associated with kidney disease or diabetes. Diuretic medications prescribed to control heart failure and hypertension cause a steady loss of fluids. Fluid problems can be sudden and severe if nausea, vomiting, and diarrhea persist for any length of time. Fever will enhance the loss of fluids in the form of sweat. Intake is reduced for residents with swallowing problems associated with Parkinson's disease, strokes, or dementia. Depression, delirium, anxiety, and agitation cause a loss of interest in food and fluids. These, and many more problems, are commonly encountered in nursing home residents.

Top-quality nursing care organizations have a variety of pre-defined care plans established to deal with hydration issues detected in the MDS evaluation process. Plans provide a structure for ongoing resident support, periodic observation, documentation, and notification when problems arise. Nutritionists or dietitians will establish the plan for food and fluid type, volume, and frequency. Speech therapists assess swallowing skills and provide recommendations regarding fluid consistency and optimal feeding position.

Occupational therapists address requirements imposed by physical disability and provide solutions, such as the use of straws, "sippy cups," vessel with large handles, or resilient grip materials. Once the degree of supervision and assessment for fluid intake is established, every member of the staff is expected to participate in plan implementation. While the focus of most hydration strategies involves improvement and maintenance of function, the nursing home must also have comprehensive plans available for managing nutrition and hydration for the terminally ill under hospice care.

## Daily Monitoring

Success in maintaining hydration requires ongoing attention to the resident's environment and daily demeanor. Staff members should ensure the ready availability of refreshing fluids throughout the day and watch to be sure they are used (see Sidebar on page 298). Hydration is not limited to the dining experience. Residents in nursing facilities must have a wide variety of fluids available hour-by-hour, just as they did prior to entering the nursing home. Staff knowledge of preferences expressed by individuals can guide the choice of fluids offered. That includes juice with breakfast, milk with cereal, coffee or tea with meals, soft drinks and water throughout the day for refreshment, and perhaps wine or beer in the evening. For those capable of

ambulation, a water cooler or drinking fountain offers a suitable source for refreshment. Bed-bound residents and those confined to chairs must have pitchers with fresh, cool water and cups within reach. Resident charts should include regular documentation regarding the amount of fluids and foods consumed at mealtime. Where fluids are readily available, most residents will take care of their needs without needing assistance. If staff members observe a decline in intake or function, an evaluation for dehydration should be promptly undertaken. Periodic weight checks are helpful, although changes may reflect problems with nutrition rather than hydration.

Residents with medical or emotional problems associated with dehydration will require more intensive monitoring of intake and urinary output. Intake volume is easy to estimate by measuring the fluids consumed from bedside pitchers and during meals. By contrast, monitoring kidney output is challenging for most ambulatory residents since collecting and measuring

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urine is neither easy nor pleasant. Demented patients may lack the mental capacity to cooperate. The frequency of visits to the bathroom provides a useful clue regarding the adequacy of renal function. For incontinent patients, experienced staff members often assess urinary concentration and volume when changing diapers. Although hardly quantitative, diaper evaluation does permit detection of major changes in output.

## Assessing Suspected Dehydration

Dehydration can develop rapidly in older individuals due to illness and changes in medication or environment. If the air-conditioning should fail on a hot afternoon, all residents need to be encouraged to consume extra fluids. Should the nursing home staff become aware of changes in a resident's appearance in regard to either health or function, immediate evaluation is needed.

Since the physical manifestations of dehydration are non-specific and often obscured by the aging process and/or illness, it is not surprising that this diagnosis is often overlooked.<sup>9</sup> Symptoms of dry mouth, fatigue, weakness, restlessness, loss of appetite, nausea, and vomiting are commonly reported. However, signs of pale dry skin and poor skin turgor can reflect normal aging. A dry mouth is more likely to reflect mouth breathing than lack of fluid intake. Constipation and fecal

impaction often occur with dehydration, but commonly occur without it. A drop in blood pressure and a rise in pulse when the resident sits or stands is one method used to detect intravascular volume deficits associated with dehydration.

While physical examination for signs of dehydration is helpful, the single most valuable indicator is a documented drop in urinary volume. The normal urine output exceeds 600cc/day for most adults. When the output falls below 400cc/day, an evaluation is needed. Most residents can successfully collect and submit a 24-hour urine specimen. However, if there is a serious question regarding dehydration, placement of a temporary urinary catheter to document output is worth doing. By having the resident to void prior to catheter placement, the presence of a possible bladder outflow obstruction can be simultaneously documented.

Laboratory tests can assist the evaluation of dehydration provided that baseline levels are available for comparison. A rise in hemoglobin and hematocrit are typical findings accompanied by a rise in the blood urea nitrogen (BUN) and creatinine levels. A normal BUN/creatinine ratio is 10:1. Due to increased urea reabsorption associated with dehydration, the ratio will shift to over 20:1. Finding a urine specific gravity over 1.015 in the absence of urinary glucose indicates the kidneys are working hard to conserve fluids. Checking a urine specimen for sodium concentration is particularly helpful. Documenting a concentration below 25 mEq/L in the absence of renal disease or diuretic therapy is a highly significant indication of a hydration problem. An even more accurate test involves calculating the urinary fractional excretion of sodium by comparing plasma and urine sodium and creatinine concentrations.

## Rehydration

If physical findings and/or laboratory tests suggest dehydration, an immediate response is required. The resident's physician should promptly be notified and rehydration efforts initiated. If the resident can ingest fluids by mouth, drinking water, diluted juice, soft drinks, electrolyte solutions (e.g., Gatorade®), soups, coffee, or tea should be encouraged. Careful documentation of fluid intake and output must be maintained until the resident is stable. There is no formula available to estimate the volume of fluid needed. Instead, staff must rely upon clinical evidence of response using the same indicators used for diagnosing dehydration. An increase in arterial pressure, urine output, and urine sodium excretion are reliable signs. Look for a return to prior levels of mental performance and a resumption of typical daily functions as further indication of success.

## Creative Hydration Programs

Lanaya Cunningham, RD

The staff at Universal Healthcare and Rehabilitation Center in Concord, North Carolina use a nourishment cart covered with a decorative canopy as part of their hydration program. The dietary staff stocks the cooler on the cart with various juices and milk, plus a variety of snacks including gelatin, ice cream, and pudding, which can also contribute to the total liquid intake of the residents. The cart is pushed from room to room, and beverages and snacks are offered at mid-morning, mid-afternoon, and in the late evening.

The afternoon hydration and nourishment pass at Taylor Extended Care Facility in Sealevel, North Carolina is part of the activity program. The cart is decorated with balloons and has music playing while the staff pushes it through the halls in the mid-afternoon. The staff offers snacks to the residents from the cart, which may consist of ice cream, soft drinks, or juices. The snacks and the music are often coordinated to coincide with the planned activity in the facility that day. The activity staff report that the residents often come into the hallway in the afternoon when they hear the music, and they look forward to receiving a beverage and snack.

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## Feeding tubes

Residents who receive food and fluids via a naso-gastric or an enterostomy tube represent a special situation since all nutrition and hydration can be controlled by the nursing staff. Nutritionists will design the protocol for both food and fluid administration. If followed with care and attention, the protocol should ensure stability.

## Summary

Hydration issues are important considerations for the elderly and infirm. What was previously taken for granted often becomes the focus of daily attention. Nursing homes must take a proactive stance in designing systems and training staff to deal with hydration. The minimum daily fluid requirements, and the steps necessary to investigate suspected dehydration, should be well known and understood by all members of the staff. **NCMedJ**

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