Complete Summary

GUIDELINE TITLE

Dehydration and fluid maintenance.

BIBLIOGRAPHIC SOURCE(S)

American Medical Directors Association (AMDA). Dehydration and fluid maintenance. Columbia (MD): American Medical Directors Association (AMDA); 2001. 28 p. [15 references]

GUIDELINE STATUS

This is the current release of the guideline.

According to the guideline developer, this guideline was reviewed by the original Steering Committee and is still considered to be current as of Jan 2007. This review involved new literature searches of electronic databases followed by expert committee review of new evidence that has emerged since the original publication date.

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

- Dehydration, including:
  - hypertonic dehydration
  - hypotonic dehydration
  - isotonic dehydration
- Other fluid/electrolyte imbalances, including:
  - excess water retention or intake
  - excess water and salt retention

GUIDELINE CATEGORY

Diagnosis
Evaluation
Management
Prevention
Risk Assessment
Treatment

CLINICAL SPECIALTY

Geriatrics

INTENDED USERS

Advanced Practice Nurses
Allied Health Personnel
Dietitians
Health Care Providers
Nurses
Pharmacists
Physician Assistants
Physicians
Social Workers

GUIDELINE OBJECTIVE(S)

- To improve the quality of care delivered to patients in long-term care facilities
- To guide the identification and management of dehydration and fluid/electrolyte imbalance in older adults residing in the long-term care settings
- To present approaches that attempt to minimize the occurrence of dehydration and fluid/electrolyte imbalance

TARGET POPULATION

Elderly residents of long-term care facilities

INTERVENTIONS AND PRACTICES CONSIDERED

Screening/Diagnosis/Evaluation

1. Using a stepwise approach, evaluation of patients for physiological and functional signs and symptoms of dehydration or another fluid/electrolyte imbalance
2. Assessment for clinical conditions and environmental factors that increase risk for dehydration or fluid/electrolyte imbalance
3. Medical evaluation as indicated [physical examination, medical history, laboratory testing (sodium, potassium, chloride, bicarbonate, blood urea nitrogen, creatinine, calcium, glucose, hemoglobin, hematocrit, serum osmolality, urinalysis, urine sodium, urine osmolality)]

4. Classification of nature and severity of fluid/electrolyte imbalance
5. Identification of causes for dehydration or other fluid/electrolyte imbalance

Management/Treatment

1. Interdisciplinary care planning
2. Symptom management
3. Treatment of causes and risks where appropriate
4. Management of specific deficits and imbalances, as indicated, such as fluid and electrolyte replacements or fluid restrictions. Fluid replacement may be by various routes, including oral, hypodermoclysis, nasogastric or gastrostomy tube or intravenous
5. Provision of general support to patients
6. Monitoring of patients response to interventions (e.g., vital signs, weight, fluid intake, laboratory tests as clinically indicated) and subsequent adjustments of interventions as needed
7. Monitoring the status and treatment of underlying causes of dehydration and review of relevant medications.

MAJOR OUTCOMES CONSIDERED

- Fluid and electrolyte status
- Comfort and well-being of patients

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Expert Consensus

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The guideline was developed by an interdisciplinary work group using a process that combined evidence- and consensus-based thinking. The groups were composed of practitioners involved in patient care in the institutional setting. Using pertinent articles and information and a draft outline, the group worked to make a simple, user-friendly guideline that focused on application in the long term care institutional setting.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

All American Medical Director Association (AMDA) clinical practice guidelines undergo external review. The draft guideline is sent to approximately 175+ reviewers. These reviewers include American Medical Director Association physician members and independent physicians, specialists, and organizations that are knowledgeable of the guideline topic and the long-term care setting.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

I. **Recognition**

Step 1

Is the patient dehydrated or does the patient have a fluid/electrolyte imbalance? Consider seriously the presence of a fluid/electrolyte imbalance

whenever a patient experiences new symptoms or a decline of an existing condition that cannot be readily attributed to another cause. Fluid/electrolyte imbalances must be identified promptly because they can increase the risk of subsequent decline and may be life threatening.

Using a stepwise approach, carefully evaluate the patient for physiological and functional signs and symptoms of dehydration or another fluid/electrolyte imbalance (see "Signs and Symptoms That May be Associated with Dehydration" below). First, perform a careful, focused medical history. Information from the patient's history that may suggest a hydration problem includes

- Decreased fluid intake or increased output
- Change in mental status
- Weight loss of 3-5 percent within 30 days
- Constipation
- Use of medication that promotes excessive urination or affects sodium and potassium balance

Signs and Symptoms That May Be Associated with Dehydration

Physiological Signs and Symptoms

- Recent rapid weight loss
- Dry eyes and/or mouth
- Change in mental status
- Fever
- Vomiting
- Postural hypotension
- Small amount of concentrated urine
- Urinary tract infections
- Pulse >100 beats/minute and/or systolic blood pressure <100 mmHg
- Dizziness

Functional Signs and Symptoms

- Lethargy and weakness
- Change in mental status
- Falling
- Change in ability to carry out activities of daily living
- Increased combativeness and confusion

The presence of multiple signs and symptoms may provide a more urgent or specific indication that the patient has a fluid or electrolyte imbalance. Recent rapid weight loss is often an important clue because it may reflect progressive depletion of fluid volume. (The loss of 1 L of fluid results in a weight loss of 1 kg, or 2.2 lb.)

If relevant symptoms or abnormalities are identified, involve a physician or other health care practitioner as soon as possible to identify the possible

causes of those symptoms (which may include fluid/electrolyte imbalance, medical illness, infection, etc.).

If dehydration or another fluid/electrolyte imbalance is identified, define its severity to determine the urgency of further assessments and interventions (see "Characterizing the Severity of Fluid/Electrolyte Imbalance" below). Mild deficits are usually readily correctable or can continue without causing major decline. Moderate or severe deficits, however, require prompt interventions and at least partial correction.

Characterizing the Severity of Fluid/Electrolyte Imbalance

Mild: Some deficits or abnormalities in laboratory values exist, but they do not seriously impair the patient's circulation, organ function, or level of functioning. Examples:

- Marginally elevated blood urea nitrogen (BUN) or high or low sodium in a patient taking diuretics
- Increased thirst in a patient who has had diarrhea for two days but is still drinking adequate amounts of fluid

Moderate: Some deficits or lab abnormalities exist that impair or are likely to impair circulation or organ function but are not immediately life threatening. Example:

- Mildly increased lethargy or confusion or decrease in blood pressure in a patient with a sodium level of 155 mEq/L whose consumption of food and fluids is reduced as a result of influenza

Severe: Deficits or abnormalities causing significant, life-threatening risks or problems with circulation, organ function, or activities of daily living. Examples:

- Rapid recent BUN elevation to >100 mg/dl in a patient whose BUN was normal a month ago
- Rapidly increasing lethargy and confusion in a patient with a recent illness whose sodium is now 123 mEq/L or who is hypotensive

If dehydration is suspected, go immediately to Step 3 to begin assessment.

Step 2

Is the patient at risk for dehydration or fluid/electrolyte imbalance? If the patient is not currently dehydrated and has either no fluid/electrolyte imbalance or a mild fluid/electrolyte imbalance, it is important to identify the risk for development or progression of these conditions. Caregivers should pay close attention to clinical conditions and environmental factors that may increase risk for dehydration or fluid/electrolyte imbalance (see "Conditions and Factors That May Increase Risk for Dehydration or Fluid/Electrolyte Imbalance" below). At the same time, caregivers should be aware that normal aging, end-of-life processes, and other clinical conditions can produce many

of the same findings. If a patient appears to be at risk, the caregiver should document this observation and address the conditions or factors that present the risk.

Conditions and Factors That May Increase Risk for Dehydration or Fluid/Electrolyte Imbalance

Clinical Conditions

- Dementia or cognitive impairment
- Fever (including low-grade fever)
- Diarrhea
- Vomiting
- Dependence on staff for eating and drinking
- Use of medications that can cause dehydration (e.g., diuretics, phenytoin, lithium, laxatives)
- Draining wounds or pressure ulcers
- Excessive sweating
- Rapid breathing
- Gastrointestinal bleeding
- Previous episodes of dehydration
- Difficult or painful swallowing
- Depression
- Small amount of dark or concentrated urine
- Excessive urination
- Nothing-by-mouth or fluid-restriction orders
- Chronic comorbidities (e.g. stroke, diabetes, congestive heart failure)
- Infection
- Dizziness

Environmental Factors

- Tube feeding
- Use of specialty beds
- Lack of social or family support
- Inadequate staffing
- Language barriers
- Isolation
- Restraints
- Facility-specific factors that may expose patients to excessive heat (e.g. malfunctioning air conditioners)

Risk Reduction. A facility-wide hydration program can contribute significantly to decreasing the risk of dehydration. The certified nursing assistant (CNA) can be a major resource for this program. Regular rounds for fluid distribution, one-on-one help with consuming fluids, records of fluid intake and output if indicated, and reporting of warning signs that caregivers have been trained to recognize all play a part in a facility-wide effort to reduce the risk of hydration problems.

Hydration should be considered part of everyone's job. Every staff member should be trained to help manage hydration and to offer fluids as appropriate,

and all staff should be involved in managing hydration. All caregiving staff should pay attention to such issues as why a patient may not be consuming fluids that are offered and ensuring that a patient's liquid preferences are identified. Questions about these issues should be asked of patients or of their family members or other advocates when patients are unable to respond.

II. Assessment

Step 3

Is a medical workup appropriate? An appropriate workup may help to identify or characterize a current dehydration or fluid/electrolyte imbalance or to define the risks for developing these problems. A physical examination and laboratory tests help to confirm the diagnosis and guide patient management (see "Criteria for Clinical Diagnosis of Dehydration" below).

Criteria for Clinical Diagnosis of Dehydration

For a clinical diagnosis of dehydration to be made, the following minimal criteria must be present:

- Suspicion of increased output and/or decreased intake
- At least two physiological or functional signs or symptoms suggesting dehydration (e.g., dizziness, dry mucous membrane, functional decline)
- A BUN/creatinine ratio of >25:1 OR orthostasis (defined as a drop in systolic blood pressure $\geq$20 mmHg on a change in position) OR a pulse of >100 beats/minute OR a pulse change of 10-20 beats/minute above baseline with a change in position

Patients should be categorized according to their level of risk for dehydration or fluid/electrolyte imbalance and given a workup appropriate to their risk level. It is not necessary to complete a workup on every patient, and not all of those who would benefit from a workup require comprehensive testing. It is important to define the level of workup that is appropriate for each patient and to consider non-interventional approaches.

If a patient has a living will or other advance directive specifying that no artificial hydration or nutrition be administered, clinicians should discuss with the patient and others involved in the patient's welfare whether a workup should proceed. If a medical workup is not performed, the reasons for this decision should be clearly documented in the patient's medical record.

Step 4

Perform pertinent additional assessment as needed. If dehydration or a fluid/electrolyte imbalance is identified or suspected and a medical workup is considered appropriate, the next step is to carry out additional assessment sufficient to define the nature of the problem, clarify its severity (see "Identifying the Nature of a Fluid/Electrolyte Imbalance" below), and identify

relevant causes (see "Categories of Causes of Fluid/Electrolyte Imbalance" below). Generally, the workup should enable an accurate diagnosis to be made and relevant interventions to be identified. In some cases, however, the workup may be limited by the patient's condition and ability to cooperate in the assessment. Other facility staff should assess environmental and other factors that may be causing or contributing to the problem or risk.

The **medical history** should include:

- A review of existing diagnoses and conditions that may be causing or contributing to dehydration
- A review of dehydration risks, signs, and symptoms, such as lightheadedness or altered mental status, and significant changes in fluid intake and output and in usual body weight
- A review of current medications
- A review of any orders such as nonessential fluid restrictions that may affect hydration status
- A review of recent bowel history
- Additional information from the patient's family members and from other members of the interdisciplinary health care team, if indicated, which may supplement data already collected

The **physical examination** should include:

- Vital signs (pulse rate, respiratory rate, body temperature, weight)
- Orthostatic blood pressure (see "Blood Pressure, Pulse, and Dehydration" below)
- Evaluation of any significant swallowing difficulty

Identifying the Nature of a Fluid/Electrolyte Imbalance

- ***Primarily fluid deficit (hypertonic dehydration)***: More water than salt is being lost (e.g., because of excess diuretic use, infections, fever, or diabetes insipidus).
- ***Primarily sodium deficit (hypotonic dehydration)***: More salt than water is being lost (e.g., because of diuretics or salt-wasting renal disease).
- ***Combined water and sodium deficit (isotonic dehydration)***: Both salt and water are lost proportionately (e.g., because of diuretics or severe or prolonged diarrhea or vomiting).
- ***Excess water retention or intake***: Water is retained inappropriately (e.g., because of syndrome of inappropriate antidiuretic hormone secretion.) or excess free water is ingested to correct isotonic fluid loss.
- ***Excess water and salt retention***: Both water and salt are retained inappropriately (e.g., because of heart or liver failure).

Categories of Causes of Fluid/Electrolyte Imbalance

- Inadequate intake (e.g., dysphagia, dementia, delirium)
- Excessive loss (e.g., diarrhea, fever, diuretics)

- Impairment of the body's ability to balance and manage fluids/electrolytes (e.g., renal failure; heart failure; cerebrovascular accident; syndrome of inappropriate antidiuretic hormone secretion; diuretics, angiotensin-converting enzyme (ACE) inhibitors, and other medications)
- Combinations of the above

Blood Pressure, Pulse, and Dehydration

Warning signs in blood pressure and pulse measurements that suggest dehydration may include the following:

- Decline in systolic blood pressure of $\geq$20 mm Hg when blood pressure is taken (for example) sequentially in lying, sitting, and standing positions (at 30 seconds and at 1, 2, and 3 minutes)
- Pulse increase of 10-20 beats/minute from baseline with a position change
- Pulse of $\geq$100 beats/minute

Certain laboratory tests (see "Laboratory Tests That May Help to Characterize the Nature and Severity of Fluid/Electrolyte Imbalance" below) may help to characterize the nature and the severity of a fluid/electrolyte imbalance, especially when high or low sodium has been identified or is suspected.

If identification of the causes of dehydration or fluid/electrolyte imbalance is appropriate, it should proceed until:

- a cause is identified or
- it is determined that a cause cannot be identified OR that the cause cannot or should not be treated OR that identifying a cause would not change the treatment or ultimate outcome.

Laboratory Tests That May Help to Characterize the Nature and Severity of Fluid/Electrolyte Imbalance

- ***Highly recommended***: sodium, potassium, chloride, bicarbonate (electrolytes), blood urea nitrogen (BUN), creatinine
- ***Recommended***: calcium, glucose, hemoglobin, hematocrit, serum osmolality
- ***Optional***: urinalysis, urine sodium, urine osmolality

To facilitate proper patient management, categorize the causes or, at a minimum, identify likely categories of causes of the patient's dehydration or other fluid/electrolyte imbalance. Document this information in the patient's medical record. Often, several categories of causes will occur simultaneously (e.g., increased loss of salt and water caused by diuretics, which leads to decreased fluid intake as a result of lethargy and confusion). Typically, several causes must be addressed simultaneously to correct the problem. For example, it may not be enough to give intravenous fluids to a patient who is continuing to lose excessive salt and water while remaining on diuretics or angiotensin-converting enzyme (ACE) inhibitors. Consider, in addition,

decreasing or eliminating any medications that may be contributing to the patient's fluid loss.

Step 5

Evaluate and document findings related to dehydration or fluid/electrolyte imbalance. Summarize the nature, severity, and causes of the patient's fluid/electrolyte imbalance or risk and assess the impact on his or her functioning and quality of life. The clinician's findings should describe the diagnoses or conditions that are contributing to the patient's current fluid/electrolyte status or explain why these could not be established or why finding them would not likely change the approach or the ultimate results. Refer to the original guideline document for examples of documentation related to varieties of fluid/electrolyte imbalance.

III. Treatment

Step 6

Are the causes and consequences of the patient's dehydration or fluid/electrolyte imbalance to be treated? If it is decided to treat the causes of the patient's dehydration or fluid/electrolyte imbalance or to intervene to correct or prevent a fluid deficit or electrolyte imbalance, proceed to Step 7. If the cause of the patient's dehydration is not clear, continue to look for that cause while providing appropriate support and symptomatic management. If it is decided not to treat or intervene because the patient has a terminal or end-stage condition or because the patient or family has requested no intervention, or for any other valid clinical reason, document the reasons for this decision in the patient's medical record.

Step 7

Develop and implement an interdisciplinary care plan. The interdisciplinary team involved in managing fluid/electrolyte balance should include certified nursing assistants (CNAs), registered or licensed nurses, the physician, and dietary staff. Other clinicians who may be involved as needed include the consultant pharmacist, psychiatrist, psychologist, speech pathologist, social worker, and physical and occupational therapists.

The physician and other members of the care team should discuss the findings of the assessment and, in concert with the patient and the patient's family or advocate, develop a plan aimed at restoring and maintaining adequate fluid/electrolyte balance. The plan should:

- Treat causes and risks where appropriate
- Address the patient's specific deficits and imbalances
- Provide overall patient support

Step 8

Prescribe appropriate treatments for the patient's dehydration or fluid/electrolyte imbalance. Factors influencing the choice of treatment include:

- The patient's underlying diagnoses or conditions that are causing or contributing to dehydration or fluid/electrolyte imbalance
- The patient's risks or potential complications that may influence the type and speed of rehydration efforts
- The patient's preferences as expressed by the patient or by family members or other advocates
- Availability of experienced providers and staff to administer treatments and monitor the patient's status

In managing fluid and electrolyte imbalance, it is important to understand how a chosen treatment course relates to the nature, causes, and severity of the problem. Ensure that decisions to use or not use potential treatment options (taking into account the patient's overall state of health, patient or advocate preferences, and any existing advanced directives) are discussed with the patient and the patient's family or advocate and documented in the medical record.

Treating causes and risks. Identify possible treatments for the patient's diagnoses or conditions that may be affecting fluid/electrolyte balance or causing dehydration, as in the following examples:

- Treat the pneumonia or heart failure causing symptoms of lethargy and confusion that have resulted in decreased fluid intake.
- Stop or reduce the dosage of the antibiotics that has caused diarrhea, which has led to excessive fluid loss.
- Stop or reduce the dosage of diuretics that has caused excessive diuresis and/or the ACE inhibitors that may have worsened the patient's sodium imbalance after diuretics caused excessive sodium loss.

Addressing deficits and imbalances. Replace approximately half of a fluid deficit within the first 24 hours. Replace the remaining deficit within the next 48-72 hours. This time frame may vary depending on the patient's symptoms and the risk of side effects caused by the rate of rehydration. A fluid-deficit calculation tool can be found in Table 13 of the original guideline document. Monitor the patient's response and adjust interventions accordingly.

Assess the patient's overall stability, paying particular attention to pulse and blood pressure. As a rule, treat hypertonic dehydration (water loss exceeding sodium loss, resulting in elevated sodium) with normal saline if the patient is hemodynamically unstable and with half-normal saline if the patient is hemodynamically stable. Treat hypotonic dehydration (sodium loss exceeding water loss, resulting in low sodium) with normal saline whether the patient is hemodynamically stable or unstable. Exceptions may be necessary in specific patient circumstances. For example, rapid infusion of normal saline may cause fluid volume overload in a patient with a markedly decreased cardiac ejection fraction.

Ensure that treatment is based on an understanding of the underlying causes of the problem. For example, one of two approaches to treating a clinically significant low sodium level (generally, <125 mEq/L) may be appropriate depending on the cause of the problem. If the cause is salt and water loss, administration of fluids and salt may be indicated. If the cause is excessive water intake or retention, fluid restriction may be necessary. Administration of excessive plain (solute-free) fluids to a patient who already has water overload or low sodium can exacerbate the imbalance and make related symptoms worse.

Choosing routes of administration. Unless contraindicated and provided that the patient can swallow safely, offer fluids by mouth frequently as well as assistance with drinking and eating as necessary. Packaged oral rehydration solutions can be very effective for the relatively stable patient with fluid/electrolyte imbalance who is able to drink.

A patient who is unstable because of an underlying fluid volume deficit will probably require intravenous rehydration. Hospitalization should be considered unless ruled out in an advance directive or unless the deficit can be steadily corrected while the patient is closely monitored in the long-term care facility.

Consider hypodermoclysis (clysis), the subcutaneous administration of replacement fluids, if this option is available and if intravenous hydration is not essential, difficult to administer, or not desired. Subcutaneously administered fluids have been shown to be absorbed effectively and can be used to achieve rehydration. However, this approach cannot be used to deliver medications or supplemental potassium. The use of clysis may satisfy a family that wishes an end-stage or dying patient to receive hydration while avoiding the use of intravenous lines or other invasive measures.

Consider a nasogastric or gastrostomy tube if other means of adequate hydration are not feasible. However, take all of the patient's circumstances into account before proceeding with such measures. Hydration by means of a tube may be inappropriate in circumstances such as that of a severely demented patient with a very poor overall prognosis who cannot swallow. Although intravenous and feeding-tube infusions are valuable in managing responsive conditions, patients with irreversible diseases or end-stage conditions usually experience multisystem failures that prevent effective maintenance of fluid/electrolyte balance even when fluids are provided artificially. If the patient or substitute decision maker elects not to receive treatment, document the reasons for withholding treatment.

Providing general support. Review existing diet orders and remove any nonessential fluid and salt restrictions. Be aware that diets of altered consistency (e.g., pureed foods and thickened liquids) may be so unpalatable that they result in decreased patient intake. Such diets are sometimes ordered because of a swallowing abnormality or symptom, but the risk of aspiration may be outweighed by the risk of weight loss and dehydration. The physician must make a rational assessment of relative risks and benefits when coexisting problems suggest incompatible interventions.

If a fluid/electrolyte imbalance is causing lethargy or delirium, provide additional help with activities of daily living until the acute problem resolves. If possible, a member of the health care team should discuss the diagnosis and treatment recommendations with the patient and the patient's family or advocate.

IV. Monitoring

Patients with dehydration or fluid/electrolyte imbalance must be reassessed regularly. Certified nursing assistants (CNAs) and other direct caregivers who spend the most time with patients from day to day are well positioned to monitor hydration status. They should be encouraged and trained to do so and to report patient activities or statements that suggest a hydration problem. Every member of the interdisciplinary care team should be vigilant in providing patients with fluids.

Review all patients' hydration status periodically. Patients who have recently had a fluid/electrolyte imbalance or who are at higher risk for fluid/electrolyte imbalance should be reviewed more frequently, as indicated by their clinical condition.

Step 9

Monitor the patient's response to treatment and adjust interventions as needed. Close daily monitoring is essential while a patient's dehydration or fluid/electrolyte imbalance is being actively corrected (see "Monitoring Acute Rehydration" below). Ongoing monitoring of patients' fluid/electrolyte status should include checking for signs and symptoms that may indicate dehydration (see "Step 1" above). Also check the patient's clinical and emotional responses to treatment.

Monitoring Acute Rehydration

- Check vital signs, weight, and, if feasible, orthostatic blood pressure.
- Assess adequacy of fluid intake, being alert for signs of overhydration, such as progressive edema or rapid weight gain ($\geq$0.5 kg/day, or $\geq$1 lb/day).
- Repeat pertinent laboratory tests as clinically indicated to ensure that fluid/electrolyte balance is being restored effectively or until it is concluded that the desired fluid/electrolyte balance cannot be restored.
- Check patients receiving intravenous fluids at least once per shift for the first 24-48 hours. In most cases, notify the clinician of the patient's status within the first 24 hours.

The value of monitoring fluid intake and output is limited. Intake monitoring may be more accurate in individuals who are completely dependent on staff for fluid intake. Output is often difficult to document accurately. Alternative monitoring indicators may include body weight, laboratory values (e.g., BUN/creatinine ratio, sodium, osmolality), and observations of a decreased volume of concentrated urine. Any clinically appropriate monitoring indicators

that a facility chooses to use are reasonable provided they are used systematically.

When checking laboratory values, focus on trends. For example, a gradually increasing or decreasing sodium level deserves close attention and repeat monitoring, whereas a sodium level that is high or low normal but stable may be clinically insignificant.

Step 10

Monitor the status and treatment of underlying causes of dehydration and review relevant medications. Continue to adjust or stop medications that may affect fluid intake, fluid balance, appetite, thirst, or level of consciousness as indicated until hydration status is stable or improving and the risk of further imbalances is minimized. If the underlying causes are not readily treatable, document why the problem cannot be treated or why the treatment is not working.

Step 11

Reassess and modify the interdisciplinary care plan as indicated. Modify the care plan to reflect decisions that are made to change or discontinue any treatments or to continue cause-specific treatments.

CLINICAL ALGORITHM(S)

An algorithm is provided for the recognition, assessment, treatment, and monitoring of fluid and electrolyte imbalances.

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The guideline was developed by an interdisciplinary workgroup using a process that combined evidence- and consensus-based thinking.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

By implementing the steps described in this guideline, health care providers in long-term care facilities can meet the needs of patients and their families, advocates, and policymakers for adequate and compassionate management of hydration and fluid/electrolyte balance.

POTENTIAL HARMS

Not stated

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

This clinical practice guideline is provided for discussion and educational purposes only and should not be used or in any way relied upon without consultation with and supervision of a qualified physician based on the case history and medical condition of a particular patient. The American Medical Directors Association, its heirs, executors, administrators, successors, and assigns hereby disclaim any and all liability for damages of whatever kind resulting from the use, negligent or otherwise, of this clinical practice guideline.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

The implementation of this clinical practice guideline (CPG) is outlined in four phases. Each phase presents a series of steps, which should be carried out in the process of implementing the practices presented in this guideline. Each phase is summarized below.

I. **Recognition**
- Define the area of improvement and determine if there is a CPG available for the defined area. Then evaluate the pertinence and feasibility of implementing the CPG.

II. **Assessment**
- Define the functions necessary for implementation and then educate and train staff. Assess and document performance and outcome indicators and then develop a system to measure outcomes.

III. **Implementation**
- Identify and document how each step of the CPG will be carried out and develop an implementation timetable.
- Identify individual responsible for each step of the CPG.
- Identify support systems that impact the direct care.
- Educate and train appropriate individuals in specific CPG implementation and then implement the CPG.

IV. **Monitoring**
- Evaluate performance based on relevant indicators and identify areas for improvement.
- Evaluate the predefined performance measures and obtain and provide feedback.

Appendix I of the original guideline document provides a quality-improvement monitoring instrument that contains indicators for reviewing hydration status.

IMPLEMENTATION TOOLS

Clinical Algorithm

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

End of Life Care
Getting Better
Living with Illness

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

American Medical Directors Association (AMDA). Dehydration and fluid maintenance. Columbia (MD): American Medical Directors Association (AMDA); 2001. 28 p. [15 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2001 (reviewed 2006)

GUIDELINE DEVELOPER(S)

American Medical Directors Association - Professional Association

GUIDELINE DEVELOPER COMMENT

Organizational participants included:

- American Association of Homes and Services for the Aging
- American College of Health Care Administrators
- American Society of Consultant Pharmacists
- Center for Health Information
- National Association of Directors of Nursing Administration in Long-Term Care
- National Association of Geriatric Nursing Assistants
- National Conference of Gerontological Nurse Practitioners

SOURCE(S) OF FUNDING

Corporate supporters of this guideline include Bristol Meyers Squibb and Ross Products Division Abbott Laboratories.

GUIDELINE COMMITTEE

Steering Committee

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

According to the guideline developer, this guideline was reviewed by the original Steering Committee and is still considered to be current as of Jan 2007. This review involved new literature searches of electronic databases followed by expert committee review of new evidence that has emerged since the original publication date.

GUIDELINE AVAILABILITY

Electronic copies: Not available at this time.

Print copies: Available from the American Medical Directors Association, 10480 Little Patuxent Pkwy, Suite 760, Columbia, MD 21044. Telephone: (800) 876-2632 or (410) 740-9743; Fax (410) 740-4572. Web site: www.amda.com

AVAILABILITY OF COMPANION DOCUMENTS

The following companion document is available:

- Guideline implementation: clinical practice guidelines. Columbia, MD: American Medical Directors Association, 1998, 28 p.

Electronic copies: Not available at this time.

Print and CDROM copies: Available from the American Medical Directors Association, 10480 Little Patuxent Pkwy, Suite 760, Columbia, MD 21044. Telephone: (800) 876-2632 or (410) 740-9743; Fax (410) 740-4572. Web site: www.amda.com

PATIENT RESOURCES

None available

NGC STATUS

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