



Complete Summary

GUIDELINE TITLE

Hydration management.

BIBLIOGRAPHIC SOURCE(S)

Mentes JC. Hydration management. Iowa City (IA): University of Iowa Gerontological Nursing Interventions Research Center, Research Dissemination Core; 2004 Feb. 43 p. [99 references]

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SCOPE

DISEASE/CONDITION(S)

- Hypertonic dehydration
- Hypotonic dehydration
- Isotonic dehydration

GUIDELINE CATEGORY

Evaluation
Management
Prevention

CLINICAL SPECIALTY

Geriatrics
Nursing

INTENDED USERS

Advanced Practice Nurses
Nurses
Physicians

GUIDELINE OBJECTIVE(S)

- To help health care providers in all settings determine adequate oral fluid intake for elders and to use strategies that will maintain hydration
- To prevent dehydration and associated conditions, such as acute confusion/delirium, infections and increased mortality

TARGET POPULATION

Elderly individuals

INTERVENTIONS AND PRACTICES CONSIDERED

1. Health history
2. Physical assessment
3. Laboratory tests
4. Functional assessments
5. Fluid intake behaviors

MAJOR OUTCOMES CONSIDERED

- Body hydration
- Incidence of infections (e.g. urinary tract infections)
- Incidence of urinary incontinence
- Urinary specific gravity
- Incidence of constipation
- Incidence of confusion, acute

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The following databases were used: CINAHL; Medline; and Current Contents, Clinical Medicine.

The following keywords were used: dehydration, volume depletion, urinary indices, fluid management.

NUMBER OF SOURCE DOCUMENTS

318 source documents

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

A = Evidence from well-designed meta-analysis

B = Evidence from well-designed controlled trials, both randomized and nonrandomized, with results that consistently support a specific action (e.g., assessment, intervention or treatment)

C = Evidence from observational studies (e.g., correlational descriptive studies) or controlled trials with inconsistent results

D = Evidence from expert opinion or multiple case reports

METHODS USED TO ANALYZE THE EVIDENCE

Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Reviewed by two experts using a common critique format.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Informal Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

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

Clinical Validation-Pilot Testing
Clinical Validation-Trial Implementation Period
External Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Clinical validation from ongoing study titled "Hydration: LTC nursing intervention for acute confusion."

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

The grades for the strength of evidence (A-D) are provided at the end of the "Major Recommendations" field.

The hydration management intervention is an individualized daily plan to promote adequate hydration based on risk factor identification that is derived from a comprehensive assessment. The intervention is divided into three phases:

1. Initial assessment and risk identification phase
2. Hydration management phase
3. Evaluation phase

Initial Assessment

Individualized assessment of elderly individuals is recommended and should include the following (see Appendix A.1 in the original guideline document for an example of an assessment form that can be used):

1. Basic physiological measures:
 - Vital signs including temperature, pulse, respirations, orthostatic blood pressure
 - weight
 - height
 - Body mass index (BMI) kg/m^2
 - Mucus membrane assessment
2. Hydration status including:
 - urine specific gravity
 - urine color
 - 24-hour intake/output
 - usual pattern of fluid intake
 - intake behaviors
 - treatments (e.g., NPO [nothing by mouth] status or tube feedings)
3. Cognitive status using a standard mental status questionnaire such as the Mini Mental State Exam (MMSE)
4. Functional health status using a standard questionnaire such as the Katz Activities of Daily Living (ADL) scale, Functional Independence Measure (FIM), or functional status items from the Minimum Data Set (MDS) for long-term care

5. Mood status using a standard questionnaire such as the Geriatric Depression Scale (GDS)
6. Medical history including:
 - Diagnoses
 - Current medical condition
 - History of over- or dehydration
7. Current medications

Risk Identification

Based on the assessment data, a risk appraisal for hydration problems is completed using the Dehydration Risk Appraisal Checklist (see Appendix A.2 in the original guideline document).

Risk of Underhydration

The more of the following indicators that are present, the greater the likelihood of dehydration:

1. Acute situations: vomiting, diarrhea, and/or febrile episodes (i.e., deviation from baseline temperature, repeated NPO status)
2. Diagnosis of:
 - Alzheimer's or other dementia
 - Major psychiatric disorders: depression
 - Cerebral vascular accident (CVA)
 - Repeated infections
 - Diabetes
 - Malnutrition
 - Urinary incontinence
 - History of dehydration
 - ≥ 4 chronic conditions
 - Cardiac arrhythmias
3. Medications:
 - Diuretics
 - Psychotropics: antipsychotics, antidepressants, and anxiolytics
 - Laxatives
 - >4 medications
 - Steroids
 - Angiotensin-converting enzyme (ACE) inhibitors
4. Age >85 years
5. Chronic cognitive impairment
6. Functional status: independent, semidependent with feeding
7. Inadequate nutritional status including the use of hyperosmolar or high protein enteral feedings

After risk appraisal is conducted, those individuals at risk for dehydration should have their trays marked with a blue flag to indicate to caregivers that they should finish 75 to 100% of their food and fluids.

Hydration Management

Managing fluid intake for optimal fluid balance consists of 1) acute management of oral intake, and 2) ongoing management of oral intake.

Acute Management of Oral Intake

Any resident who develops a fever, vomiting, diarrhea, or a non-febrile infection should be closely monitored by implementing intake and output records and provision of additional fluids as tolerated (Weinberg et al., 1994. Evidence Grade = C). Individuals who are required to be NPO for diagnostic tests should be given special consideration to shorten the time that they must be NPO and should be provided with adequate amounts of fluids and food when they have completed their tests. For many procedures a 2 hour fluid fast is recommended (American Society of Anesthesiology, 1999. Evidence Grade = D).

Any resident who develops unexplained weight gain, pedal edema, neck vein distension, or shortness of breath should be closely monitored for overhydration. Fluids should be temporarily restricted, and the resident's primary care provider notified.

Ongoing Management of Oral Intake

Ongoing management of oral intake consists of the following five components:

1. Calculate a daily fluid goal.

All residents will have an individualized fluid goal determined by a documented standard for daily fluid intake. There is preliminary evidence that the standard suggested by Skipper (1998) of 100 mL/kg for first 10 kg of weight, 50 mL/kg for next 10 kg, and 15 mL for remaining kg is preferred (Chidester & Spangler, 1997).

Since this standard reflects fluid from all sources, to calculate a standard for fluids alone, 75% of the total calculated from the formula can be used. See the original guideline document for other standards.

2. Compare resident's current intake to the amount calculated from applying the standard.
3. Provide fluids consistently throughout the day.
 - a. Plan fluid intake as follows: 75 to 80% delivered at meals, 20 to 25% delivered during non-meal times, such as medication times and planned nourishment times.
 - b. Offer a variety of fluids, keeping in mind the individual's previous intake pattern (Zembrzuski, 1997. Evidence Grade = D). Alcoholic beverages which exert a diuretic effect on the resident should not be counted toward the fluid goal. Caffeinated beverages may be counted toward the fluid goal based on individual assessment, as there is preliminary evidence that in individuals who are regular users there are no untoward effect on fluid balance (Martof & Knox, 1997. Evidence Grade = C) (See Appendix B in the original guideline document for Comparisons of Common Oral Fluids).

- c. Fluid with medication administrations should be standardized to a prescribed amount (e.g., 180 mL [6 oz] per administration time).
4. Plan for at risk individuals

For residents who are at risk of underhydration because of poor intake, the following strategies can be implemented based on unit preference, time, and staffing issues:

- Fluid rounds mid-morning and late afternoon, where caregiver provides additional fluids (Spangler, Risley, & Bilyew, 1984. Evidence Grade = B).
 - Provide 2 8-oz glasses of fluid in AM and PM (Robinson & Rosher, 2002. Evidence Grade = B).
 - "Happy Hours" in the afternoon, where residents can gather together for additional fluids and socialization (Musson et al., 1990. Evidence Grade = C)
 - "Tea Time" in the afternoon, where residents come together for fluids, nourishment, and socialization (Mueller & Boisin, 1989. Evidence Grade = D)
 - Use of modified fluid containers based on resident's intake behaviors (e.g., ability to hold cup, to swallow) (Mueller & Boisin, 1989; Reedy, 1988. Evidence Grade = D)
 - Offer a variety of fluids and encourage ongoing intake throughout the day for cognitively impaired residents. Offer fluids that residents prefer (Simmons, Alessi, & Schenelle, 2001. Evidence Grade = B).
5. Fluid regulation and documentation
 - Individuals who are cognitively intact and visually capable can be taught how to regulate their intake through the use of a color chart to compare to the color of their urine (Armstrong et al., 1994, 1998. Evidence Grade = B). For those who are cognitively impaired, caregivers can be taught how to use the color chart.
 - Frequency of documentation of fluid intake will vary from setting to setting and is dependent on an individual's condition. However in most settings at least one accurate intake and output recording should be documented and should include: the amount of fluid consumed, intake pattern, difficulties with consumption, and a urine specific gravity and color.
 - Accurate calculation of intake requires knowledge of the volumes of containers used to serve fluids, which should be posted in a prominent place on the care unit, as a study by Burns (1992. Evidence Grade = C) suggested that nurses over- or underestimated the volumes of common vessels.

Evaluation

Adherence to the hydration management guideline can be monitored by (frequency of monitoring to be determined by setting):

- urine specific gravity checks, preferably a morning specimen (Armstrong et al., 1994, 1998. Evidence Grade = B; Wakefield et al., 2002. Evidence Grade = C). A value greater than or equal to 1.020 implies an underhydrated state

and requires further monitoring (Mentes, 2000; Kavouras, 2002. Evidence Grade = C).

- urine color chart monitoring, preferably a morning specimen (Armstrong et al., 1994, 1998; Wakefield et al., 2002. Evidence Grade = B)
- 24-hour intake recording (output recording may be added; however in settings where individuals are incontinent of urine, an intake recording should suffice)

Deviations from the guideline should be discussed with the individual's primary nurse, and updated plans to manage hydration status will be implemented.

Definitions:

Rating Scheme for Strength of Evidence

A = Evidence from well-designed meta-analysis

B = Evidence from well-designed controlled trials, both randomized and nonrandomized, with results that consistently support a specific action (e.g., assessment, intervention or treatment)

C = Evidence from observational studies (e.g., correlational descriptive studies) or controlled trials with inconsistent results

D = Evidence from expert opinion or multiple case reports

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

REFERENCES SUPPORTING THE RECOMMENDATIONS

[References open in a new window](#)

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The recommendations were based on a review of the literature, guidelines published by other groups and a consensus opinion of content expert(s).

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

- Maintenance of body hydration
- Decreased infections (e.g., urinary tract infections)
- Improvement in urinary incontinence
- Lowered urinary pH

- Decreased constipation
- Decreased acute confusion

Subgroups Most Likely to Benefit

The following screening criteria indicate patients who are likely to benefit the most from use of this protocol:

- All individuals >85 years of age
- All elders living in a long-term living arrangement, such as a nursing home
- Individuals with recent weight loss $\geq 5\%$ of body weight
- Individuals with feeding/eating difficulties
- Individuals with a diagnosis of dementia
- Individuals with congestive heart failure
- Febrile individuals

POTENTIAL HARMS

There is a slight risk of overhydration.

Subgroups Most Likely to be Harmed

Patients with severe chronic heart failure or renal failure, or chronic psychiatric patients who are polydipsic

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

This evidence-based practice is a general guideline. Patient care continues to require individualization based on patient needs and requests.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

The appendices provided in the original guideline document include strategies for implementation.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Staying Healthy

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Mentes JC. Hydration management. Iowa City (IA): University of Iowa Gerontological Nursing Interventions Research Center, Research Dissemination Core; 2004 Feb. 43 p. [99 references]

ADAPTATION

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

DATE RELEASED

1998 (revised 2004 Feb)

GUIDELINE DEVELOPER(S)

University of Iowa Gerontological Nursing Interventions Research Center,
Research Dissemination Core - Academic Institution

SOURCE(S) OF FUNDING

Developed with the support provided by Grant #P30 NR03979, National Institute of Nursing Research, NIH

GUIDELINE COMMITTEE

The Iowa Veterans Affairs Nursing Research Consortium

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.

This guideline updates a previous version: The Iowa Veterans Affairs Nursing Research Consortium. Mentes JC. Hydration management. Iowa City (IA): University of Iowa Gerontological Nursing Interventions Research Center, Research Dissemination Core; 1998. 34 p.

GUIDELINE AVAILABILITY

Electronic copies: Not available at this time.

Print copies: Available from the University of Iowa Gerontological Nursing Interventions Research Center, Research Dissemination Core, 4118 Westlawn, Iowa City, IA 52242. For more information, please see the [University of Iowa Gerontological Nursing Interventions Research Center Web site](#).

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- Hydration management. Quick Reference Guide. Iowa City (IA): University of Iowa Gerontological Nursing Interventions Research Center, Research Dissemination Core; 2004. 4 p.

Print copies: Available from the University of Iowa Gerontological Nursing Interventions Research Center, Research Dissemination Core, 4118 Westlawn, Iowa City, IA 52242. For more information, please see the [University of Iowa Gerontological Nursing Interventions Research Center Web site](#).

PATIENT RESOURCES

The following is available:

- Hydration management. Consumer information. Iowa City (IA): University of Iowa Gerontological Nursing Interventions Research Center, Research Dissemination Core; 2004. 2 p.

Print copies: Available from the University of Iowa Gerontological Nursing Interventions Research Center, Research Dissemination Core, 4118 Westlawn, Iowa City, IA 52242. For more information, please see the [University of Iowa Gerontological Nursing Interventions Research Center Web site](#).

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC STATUS

This summary was completed by ECRI on March 1, 1999. The information was verified by the guideline developer on May 5, 1999. This summary was updated by ECRI on June 8, 2004. The information was verified by the guideline developer on August 5, 2004.

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Date Modified: 11/15/2004

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