Evaluation and Management of Dehydration Due to Acute Infectious Process Clinical Practice Guideline

Approved by the SSM Health Pediatric Clinical Practice Guidelines Committee: June 13, 2025

Approved by the SSM Health Pediatric Clinical Program: June 23, 2025

EXCLUSION CRITERIA

- Age ≤ 2 months
- Presence of severe illness (including severe sepsis, signs of shock, diabetic ketoacidosis)
- Presence of an unstable or severe underlying chronic medical condition
- Acute vomiting with new headache, neurologic findings, or other red flags on history/exam
- Bilious vomiting, focal abdominal tenderness, distention, or other finding suggestive of a surgical abdomen
- Known or suspected pregnancy

SUSPECTED DEHYDRATION DUE TO INFECTIOUS PROCESS BASED ON INITIAL ASSESSMENT

INITIAL ASSESSMENT

- Obtain Thorough History
  - Timing of onset, type, and frequency of any GI losses
  - Presence of fever
  - Respiratory symptoms, mental status/activity changes
  - Intake since onset of illness (feeding type, volume, frequency, and tolerance)
  - Output since onset of illness (wet diapers or voids)
  - Known infectious exposures or travel
  - Medications, Medical History, Recent Surgeries, Pertinent Family History
- Obtain Complete Vital Signs (Temp, HR, RR, SpO2, Blood Pressure)
- Obtain Complete Exam

CLINICAL DEHYDRATION INDICATORS

- Obtain weight, compare to known baseline or prior/recent weight
- Mental status/activity depression
- Capillary refill > 2 seconds
- Dry mucous membranes
- Decreased or absence of tears
- Tachypnea (even in the presence of suspected respiratory tract infection)
- Sunken eyes or fontanelle
- Decreased Urine Output (< 0.5mL/kg/hr for 24 hours or < 3 voids in a 24 hour period)
- Tachycardia
- Skin turgor changes

PERFORM CLNICAL DEHYDRATION SEVERITY STRATIFICATION AND ASSESS THE NEED FOR NON-ORAL HYDRATION SUPPORT

DEHYDRATION INDICATORS DISCLAIMER

- No single Clinical Dehydration Scoring system has been validated to reliably diagnose the degree or severity of dehydration better than provider assessment in each individual clinical scenario. Lab evaluation alone does not diagnose clinical dehydration.
- Weight loss percentage is the most sensitive clinical indicator alone, while increasing numbers of present clinical indicators increases the likelihood of clinical dehydration.
- Clinical assessment of all patients should be performed, with providers using their best judgement in the context of the patient, illness, and risk factors

MINIMAL/MILD DEHYDRATION

Weight change of < 5% from baseline and/or APPROXIMATELY 2 or fewer Clinical Dehydration Indicators in the presence of clinical suspicion for dehydration

Recommended Rehydration Strategies
- Provide Oral Rehydration Therapy (ORT)/Oral Challenge
  - Give 1-2mL/kg (max 30mL) of Pedialyte or other oral hydration solution every 5 minutes for up to 30 minutes
  - Alternative fluid/oral intake may be given as clinically appropriate (Gatorade, popsicle, etc)
- Implement appropriate non-oral hydration support, if indicated or if oral challenge is failed (*see below and Page 2*)

Other Treatment and Assessment
- Assess and treat underlying cause of illness as clinically indicated
- Give ondansetron if no doses received within the past 6 hours for patients with vomiting within the preceding 4 hours (*see Box 1, Page 2 for dosing*)
- Treat fever or pain with appropriate anti-pyretic/analgesic therapy

MODERATE DEHYDRATION

Weight change of 5-9% from baseline and/or APPROXIMATELY 3-4 Clinical Dehydration Indicators in the presence of clinical suspicion for dehydration

Recommended Rehydration Strategies
- Implement appropriate non-oral hydration support, if indicated (*see below and Page 2*)

OR
- Provide Oral Rehydration Therapy (ORT)/Oral Challenge, if indicated
  - Give 1-2mL/kg (max 30mL) of Pedialyte or other oral hydration solution every 5 minutes for up to 30 minutes
  - Alternative fluid/oral intake may be given as clinically appropriate (Gatorade, popsicle, etc)

Other Treatment and Assessment
- Assess and treat underlying cause of illness as clinically indicated
- Treat fever or pain with appropriate anti-pyretic/analgesic therapy
- Consider BMP for patients with prolonged excessive losses or other clinical concern for high risk of significant electrolyte abnormality
- Give ondansetron if no doses received within the past 6 hours for patients with vomiting within the preceding 4 hours (*see Box 1, Page 2 for dosing*)

SEVERE DEHYDRATION

Weight change of ≥ 10% from baseline and/or APPROXIMATELY 4 or more Clinical Dehydration Indicators in the presence of clinical suspicion for dehydration.
Severe mental status change in the setting of suspected dehydration in the absence of other clinical indicators may indicate severe dehydration, other clinical illness, or glucose/electrolyte derangement

Recommended Rehydration Strategies
- Implement appropriate Non-Oral Hydration fluid resuscitation (*see below*)

Other Treatment and Assessment
- Stabilize airway, breathing, circulation as indicated
- Assess and treat underlying cause of illness as clinically indicated
- Treat fever or pain with appropriate anti-pyretic/analgesic therapy
- Consider labs (BMP, POC glucose), especially for altered mental status, severe GI losses, or indicated by suspected disease process
- Give ondansetron if no doses received within the past 6 hours for patients with vomiting within the preceding 4 hours (*see Box 1, Page 2 for dosing*)

REASSESS ALL PATIENTS FOLLOWING ANY INTERVENTION STRATEGY AND PROVIDE ADDITIONAL INTERVENTION AS INDICATED BASED ON REASSESSMENT, PRIOR TO DETERMINING DISPOSITION

ASSESS DISCHARGE CRITERIA (*Box 3, Page 2*) TO DETERMINE READINESS FOR HOME FROM ANY CLINICAL SETTING

FOR PATIENTS REQUIRING ADMISSION, ENSURE APPROPRIATE ACCESS IS IN PLACE IF DEHYDRATION IS THE PRIMARY INDICATION FOR ADMISSION, AND INITIATE MAINTENANCE FLUID THERAPY IF INDICATED (*Box 4, Page 2*)

NON-ORAL REHYDRATION STRATEGIES AND CONSIDERATIONS

NASOGASTRIC (NG) TUBE HYDRATION

Considerations for Use
- IV fluid shortage/conservation required
- Shared decision making with caregiver: NG vs IV vs SQ placement
- Ability/resources to obtain stable IV access and/or place an NG
- Age (may be more poorly tolerated by older patients, though not an absolute contraindication)
- Absence of intractable vomiting
- Degree of illness (IV recommended for severely ill or concern for hemodynamic instability)
- No anatomic contraindication (recent sinus/pharyngeal surgery, mass, active bleed, or other)

Bolus Therapy

Pedialyte, 20mL/kg (max 600mL) over 60 minutes

INTRAVENOUS (IV) HYDRATION

Considerations for Use
- Shared decision making with caregiver: NG vs IV vs SQ placement
- Significant electrolyte derangements, including hypoglycemia
- Significant alteration of mental status
- Active or impending hemodynamic instability
- Need for additional IV therapies for underlying illness
- Anticipated need for admission for IV therapy (fluids or other medications)

Bolus Therapy
- Isotonic fluid (Normal Saline or Lactated Ringer's), 20mL/kg (max 1000mL) over 30 to 60 minutes
- Consider 10-20mL/kg (max 1000mL) bolus with D5 NS or D5 LR instead of non-dextrose isotonic fluids if the patient has hypoglycemia or there is concern for ketosis due to poor intake and vomiting

SUBCUTANEOUS (SQ) HYDRATION

Considerations for Use
- Shared decision making with caregiver: NG vs IV vs SQ placement
- Failure of IV placement despite appropriate attempts on local policy/protocol/procedure
- May not be appropriate for severely dehydrated patients or patients with significant illness
- Minimal concern of active or impending hemodynamic instability (shock and severe illness are exclusion criteria for this guideline)

Process and Bolus Therapy
- 1mL (150U) Hylenex injected subcutaneously into the para-scapula or anterior thigh, with a secured 22-24g butterfly catheter
- Isotonic fluid (Normal Saline or Lactated Ringer's), 20mL/kg (max 1000mL) over 30 to 60 minutes

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GUIDELINE AIM

- Provide appropriate guidance for the assessment and intervention strategies for pediatric patients with dehydration due to acute infectious processes seeking care in the SSM Health System
- Promote seamless care during transitions from the emergency department to the inpatient care setting
- Identify hydration strategies of use during times of fluid or supply shortage

BOX 1: ONDANSETRON (ZOFRAN) DOSING AND CONTRAINDICATIONS

Dosing
- < 8kg: 0.15mg/kg oral solution
- 8kg to 15kg: 2mg oral disintegrating tab or oral solution
- 15 to 30kg: 4mg oral disintegrating tab or oral solution
- > 30kg: 8mg oral disintegrating tab or oral solution

Contraindications
- Known allergy
- Known QTc prolongation
- Serotonin Syndrome

BOX 2: CONSIDERATIONS FOR IMPLEMENTATION OF NON-ORAL REHYDRATION STRATEGIES

- Inability to tolerate oral intake
- Pain, fever, and nausea control have been addressed as optimally as possible
- Mental status
- Degree and type of ongoing losses (sensible and insensible)
- Respiratory status and support needs, need for other IV therapy, anticipated need for admission
- Whether labs are being obtained (if yes, consider IV placement)
- Known significant electrolyte derangement if labs obtained

BOX 3: DISCHARGE CRITERIA AND INSTRUCTIONS

Discharge Criteria
- Stable to improved clinical status with acceptable vital signs for age
- Tolerating oral rehydration therapy with intake ability exceeding active or anticipated ongoing losses/output
- No clinical indication of need for non-oral hydration strategy (IV, NG, SQ)
- Family comprehends the status and condition, return precautions, reliable transportation, and reliable communication device with the ability to return to care or follow-up as indicated

Discharge Instructions
- Provide oral syringes, if able
- ORT: Instruct family to provide 1-2mL/kg (specify volume, max 30mL) of Pedialyte or other oral rehydration solution every 5 minutes for 4-6 hours
- Provide signs and symptoms of worsening hydration status, return precautions (worsening vomiting, inability to tolerate ORT, < 3 wet diapers in 24 hours, development of Clinical Indicators of Dehydration)

BOX 4: MAINTENANCE FLUID RECOMMENDATIONS

Nasogastric (NG) Therapy
- Provide intermittent Pedialyte boluses (every 3 to 4 hours) to replace GI losses and provide daily maintenance fluid volume

Intravenous (IV) Therapy
- Generally, isotonic fluid therapy with dextrose is recommended
- Consider adding potassium if K is low, urine output has been established, there is no clinical concern for risk hemolysis or rhabdomyolysis, and there is anticipated to be minimal oral intake for an extended period of time
- Adjust fluid administered and rate based on clinical condition, presence of sodium or other electrolyte derangements, type and volume of losses
- Standard fluid type
  - D5 NS with up to 20mEq/L KCL OR D5 LR (LR has 4mEq/L KCl)
- Rate
  - 4-2-1 rule, max 100mL/hr
  - May consider a higher rate (1.25-2x maintenance) if there is excessive ongoing losses or suspicion for volume depletion not requiring further bolus therapy

Subcutaneous (SQ) Therapy
- Use same type of fluids and rate as for IV therapy, but do not add potassium
- After 24 hours of SQ hydration, there are 3 options:
  - Discontinuation of IV fluids and removal of the SQ catheter if no further fluids are needed
  - Repeat administration of hylenex (can be repeated at hour 24 and hour 48 for a total of 72 hours of use
  - Placement of a peripheral IV and removal of the SQ catheter if further fluids are needed

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