### Outcomes/Goals
1. Effective use of oral rehydration therapy for moderate dehydration
2. Decrease IV hydration and hospital admissions with aggressive ORT

### NURSE
- **Chief complaint.** Onset of nausea/vomiting/diarrhea. Document type and amount of PO intake, number episodes of vomiting and/or diarrhea in the last 24 hours, number wet diapers in last 24 hours. Physical assessment: general appearance or LOC, capillary refill time, skin turgor, absence of moist mucous membranes and/or tears, abnormal respiratory pattern, fontanel, and/or sunken eyes. Initiate isolation if suspected infectious process.

### Inclusion Criteria
- Pediatric patients < 20 years old with reported history of vomiting or diarrhea

### Exclusion Criteria
- <6 months old, bloody diarrhea, bilious emesis, hypo- or hypernatremia, comorbid conditions (metabolic disorder, cardiac disease, etc.), suspected surgical process

### INTERVENTIONS
**On arrival**
- ESI Triage I – IV, depending on severity of dehydration
- Isolation: contact or contact plus
- Full set of vitals
- Ondansetron ODT/PO -- Do not give to infants <6 months, see dosing below
- Initiate ORT if patient has moderate dehydration
- Place topical Lidocaine (LMX) or order J-tip in anticipation of peripheral IV start
- Place on monitor if ill appearing
- Weigh all diapers / document I/O

### DIAGNOSTICS
- Bedside CBG for moderate to severe dehydration, altered mental status, or lethargic
- BMP, UA, Stool culture – if indicated

### PHYSICIAN (LIP)
**PO Fluids**
- **ORT PER PROTOCOL**
  - **<10 kg** 5 mL every 5 min (for 20 minutes total)
    - If tolerated, then advance to 10 mL every 5 minutes (reassess in 30-60 min)
  - **≥10kg** 10 mL every 5 min (for 20 minutes total)
    - If tolerated, then advance to 20 mL every 5 minutes (reassess in 30-60 min)
  - **≥30kg** 30mL every 5 min (for 40 minutes total)
    - if tolerated, advance to 60mL every 5 minutes (reassess in 30-60 min)

**If emesis after/during first 20 minutes, hold PO for 20 minutes**
- Consider additional dose of Ondansetron
- Restart ORT after 20 minutes
**Document all I/O**

**IV Fluids (if indicated)**
- NS bolus 20 mL/kg x 2. Reassess between boluses for effectiveness.
- Consider starting with 10 mL/kg boluses for neonates, cardiac, frail, and/or malnourished infants and reassess in between boluses for effectiveness.

### Medication
**Anti-emetics**
- Ondansetron dosing guidelines:
  - Oral dose:
    - 7-14 kg: 1-2 mg
    - 15-26 kg: 2-4 mg
    - >27 kg: 8 mg
  - IV dose: 6 months – 18 years of age: 0.1 -0.2 mg/kg/dose (max 8 mg)
  - D10W bolus 2-5ml/kg bolus, then D5 0.45-0.9NaCl + 20KCl maintenance PRN

**Dextrose (hypoglycemia)**
- Demonstrated ability to tolerate adequate PO fluids
- Parents instructed on and able to continue further oral rehydration at home
- Vital signs stable / no clinical signs of shock/hypovolemia
- Assessment at or near baseline for LOC
Clinical Pathway Decision Making Process:
Pediatric Dehydration
February 2021

Exclusion Criteria
- <6 months old
- Bloody diarrhea
- Bilious emesis
- Hypo- or hypernatremia
- Co-morbid conditions (Metabolic disorder, cardiac disease, etc.)
- Suspected surgical process

>6 months old
Diarrhea +/- Vomiting
Assess for signs of dehydration and calculate dehydration score

Hypoglycemia
- Defined as glucose < 70 in kids and infants > 6 months of age
- Give 4-5 mL/kg of D10W; Recheck glucose in 30 minutes
- Start glucose containing maintenance fluids if persists

Minimal to No Dehydration
(<5%)
Score 0-1
ESI 4
Consider Ondansetron and PO Challenge

Moderate Dehydration
(5-9%)
Score 2-4
ESI 3 or 4
Administer Ondansetron, CBG, and Begin ORT

Severe Dehydration/Shock or Toxin Appearance
(>9%)
Score 5-8
ESI 1 or 2
Resuscitate
Immediate actions: CBG, BMP, monitor, room placement, IV fluids 20 mL/kg NS, reassess between boluses

Double ORT volume
Reassess in 30-60 minutes

Tolerating ORT?
YES
NO
Able to tolerate 20-30 min ORT trial

Follow ORT protocol
Prepare for Discharge
(See Discharge Criteria page 1)

Tolerating ORT?
YES
NO
Initiate IV Fluid bolus
20mL/kg, repeat prn. Get BMP. Reassess. Tolerating PO intake and well appearing?

Oral Rehydration
- Children with no/mild dehydration can be discharged home after successful PO trial and education
  <10 kg 5 mL every 5 min (for 20 minutes total): If tolerated, advance to 10mL every 5 minutes (reassess in 30-60 min)
  ≥10kg 10 mL every 5 min (for 20 minutes total): If tolerated, advance to 20 mL every 5 minutes (reassess in 30-60 min)
  ≥30kg 30mL every 5 min (for 40 minutes total): if tolerated, advance to 60mL every 5 minutes (reassess in 30-60 min)

Definition of Oral Rehydration Failure
- Emesis after second Ondansetron dose OR Refusal to take from syringe/cup for > 30 minutes
Pediatric Dehydration: Goals of Clinical Pathway

1. Rapid identification and treatment of children with moderate to severe dehydration
2. Effective use of oral rehydration therapy per protocol for moderate dehydration prior to intravenous therapy
3. Team-oriented approach to efficient, timely evaluation and workup
4. Decrease hospital admissions due to care in ED and parental education for at-home care

Data Considerations

<table>
<thead>
<tr>
<th>Interventions</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti-emetics</td>
<td>Ondansetron</td>
</tr>
<tr>
<td>Rehydration</td>
<td>Oral Rehydration Therapy (ORT)</td>
</tr>
</tbody>
</table>

### Table 1. Dehydration Score

<table>
<thead>
<tr>
<th>Point Value for Calculation</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Normal</td>
<td>Thirsty, Restless, or lethargic but irritable when touched</td>
<td>Drowsy Limp, cold, or sweaty, +/- comatose</td>
</tr>
<tr>
<td>Eyes</td>
<td>Normal</td>
<td>Slightly sunken</td>
<td>Very sunken</td>
</tr>
<tr>
<td>Mucous Membranes (tongue)</td>
<td>Moist</td>
<td>Sticky</td>
<td>Dry</td>
</tr>
<tr>
<td>Tears</td>
<td>Tears</td>
<td>Decreased tears</td>
<td>Absent tears</td>
</tr>
</tbody>
</table>

*Point values are added up to obtain a final score. Zero indicates no dehydration; 1-4 mild dehydration; 5-8 indicates moderate to severe dehydration.*

Adapted from: Hendrickson et al, Pediatric Emergency Care, 2018; 34: 227–232

### Table 2. Further Estimating the Degree of Dehydration

<table>
<thead>
<tr>
<th>Dehydration</th>
<th>Minimal to none</th>
<th>Mild to Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight Loss</td>
<td>&lt;3-5%</td>
<td>5-9%</td>
<td>&gt;9%</td>
</tr>
<tr>
<td>Mental Status</td>
<td>Well, alert</td>
<td>Normal, fatigued or restless, irritable</td>
<td>Apathetic, lethargic, unconscious</td>
</tr>
<tr>
<td>Thirst</td>
<td>Normal, may refuse</td>
<td>Thirsty, eager to drink</td>
<td>Drinks poorly, unable to drink</td>
</tr>
<tr>
<td>Heart rate</td>
<td>Normal</td>
<td>Normal to increased</td>
<td>Increased</td>
</tr>
<tr>
<td>Quality of pulses</td>
<td>Normal</td>
<td>Normal to decreased</td>
<td>Weak, thready, or impalpable</td>
</tr>
<tr>
<td>Breathing</td>
<td>Normal</td>
<td>Normal; fast</td>
<td>Deep</td>
</tr>
<tr>
<td>Mouth and Tongue</td>
<td>Normal, moist</td>
<td>Dry</td>
<td>Parched</td>
</tr>
<tr>
<td>Eyes</td>
<td>Normal</td>
<td>Slightly sunken</td>
<td>Deeply sunken</td>
</tr>
<tr>
<td>Tears</td>
<td>Present</td>
<td>Decreased</td>
<td>Absent</td>
</tr>
<tr>
<td>Skin fold</td>
<td>Instant recoil</td>
<td>Recoil in &lt;2 seconds</td>
<td>Recoil in &gt;2 seconds</td>
</tr>
<tr>
<td>Capillary Refill</td>
<td>Normal</td>
<td>Prolonged</td>
<td>Prolonged; minimal</td>
</tr>
<tr>
<td>Extremities</td>
<td>Warm</td>
<td>Cool</td>
<td>Cold, mottled, cyanotic</td>
</tr>
<tr>
<td>Urine output</td>
<td>Normal to decreased</td>
<td>Decreased</td>
<td>Minimal</td>
</tr>
</tbody>
</table>

Adapted from: [https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5216a1.htm#tab1](https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5216a1.htm#tab1)
<table>
<thead>
<tr>
<th>Risk Factors for Dehydration or More Severe Illness</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Young age (e.g., aged &lt;6 months) or weight &lt;8.5kg</td>
</tr>
<tr>
<td>• Premature birth, history of chronic medical conditions or concurrent illness</td>
</tr>
<tr>
<td>• Fever &gt;38 °C (100.4 °F) for infants aged &lt;3 months or &gt;39 °C (102.2 °F) for children aged 3–36 months</td>
</tr>
<tr>
<td>• Visible blood in stool</td>
</tr>
<tr>
<td>• High output diarrhea, including frequent and substantial volumes of stool</td>
</tr>
<tr>
<td>• Persistent vomiting</td>
</tr>
<tr>
<td>• Caregiver’s report of signs consistent with dehydration (e.g., sunken eyes or decreased tears, dry mucous membranes, or decreased urine output)</td>
</tr>
<tr>
<td>• Change in mental status (e.g., irritability, apathy, or lethargy)</td>
</tr>
<tr>
<td>• Suboptimal response to oral rehydration therapy already administered or inability of the caregiver to administer oral rehydration therapy</td>
</tr>
</tbody>
</table>

References: