Colon Cancer and Dehydration

March 2015
Colon Cancer: Causes of Dehydration

• Treatment
  – Chemotherapy
  – Radiation Therapy
  – Oral Oncolytics

• Post-treatment
  – Ileostomy
  – Survivorship
# Example Treatments, Side Effects

<table>
<thead>
<tr>
<th>Drug</th>
<th>Nausea</th>
<th>Vomiting</th>
<th>Diarrhea</th>
<th>Fatigue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xeloda</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Elotaxin</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Avastin</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Adrucil</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Erbitux</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Zaltrap</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Vectibix</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Camptosar</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

Source: Manufacturer websites
Losing just 2% of your fluids constitutes clinical dehydration.

A single episode of diarrhea or vomiting is likely to make you clinically dehydrated.

Water as a percentage of Body Mass: Men = 60%  Women = 50%

Exercise in the Heat. II. Critical Concepts in Rehydration...
Douglas J. Casa, PhD, ATC, CSCS  J Athl Train. 1999 Jul-Sep; 34(3): 253–262. PMCID: PMC1322919
Dehydration for Colon Cancer Patients

When you lose fluids, you lose key electrolytes

• Treatment side effects shed both fluids & electrolytes
• Electrolyte replenishment is critical for recovery
• Chemo agents must be flushed out of cells for healing
• Water alone will not replenish crucial electrolytes
Physiological Effects of Dehydration

- Increased cardiovascular strain
- Reduced body heat dissipation
- Central blood volume reduction
- Heat cramps & fatigue cramps
- Hyponatremia (not enough salt)
- Core temperature rises fast, high
Psychological Effects of Dehydration

- Moodiness and/or irritability
- Decreased mental vigilance
- Headaches
- Increased perception of effort
- Slowed memory
- Reduced reaction time
- Fine motor skills degradation

Mild dehydration impairs cognitive performance and mood of men.

Dehydration Treatment Options

- Water
- Fruit Juices
- Sports Drinks
- “Enhanced Waters”
- Intravenous Fluids
- Oral Rehydration Solution
The Hydration Landscape

ORS
Alternative to IV therapy, rapid absorption.

Electrolyte Drinks

Sports Drinks
Non-functional drinks containing excess sugar and too few electrolytes.
What is Oral Rehydration Solution?

Commercializes for patients what *The Lancet* described in 1978 as “potentially the most important medical advance this century”

- Developed by the World Health Organization
  - Used for cholera, dysentery, Ebola
  - Millions of patients successfully treated using ORS
  - Developed as IV fluid alternative
- Precise ratio of sodium and glucose
- Clinically significant electrolyte levels
- Near instantaneous absorption
- Rapid gastric emptying

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# Nutritional Comparisons

<table>
<thead>
<tr>
<th></th>
<th>H2ORS Oral Hydration Solution</th>
<th>Sports Drinks</th>
<th>Pediatric Electrolytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osmolarity (mmo/L)</td>
<td>221</td>
<td>358</td>
<td>250</td>
</tr>
<tr>
<td>Carbohydrates (g/L)</td>
<td>22</td>
<td>58</td>
<td>25</td>
</tr>
<tr>
<td>Calories/L</td>
<td>90</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>Sodium (mg/L)</td>
<td>1380</td>
<td>458</td>
<td>1033</td>
</tr>
<tr>
<td>Chloride (mg/L)</td>
<td>1840</td>
<td>127</td>
<td>1239</td>
</tr>
<tr>
<td>Potassium (mg/L)</td>
<td>600</td>
<td>125</td>
<td>780</td>
</tr>
<tr>
<td>Zinc (mg/L)</td>
<td>52</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Citrate (mg/L)</td>
<td>1670</td>
<td>0</td>
<td>30</td>
</tr>
<tr>
<td>Sweeteners</td>
<td>Dextrose, Sucralose</td>
<td>Sucrose, Fructose, Sucralose, HFCS</td>
<td>Glucose, Sucralose, Fructose, Maltodextrin</td>
</tr>
</tbody>
</table>

* Dextrose/Glucose required for co-transport of sodium
ORS Benefits

• Effective for active vomiting and/or diarrhea
• Helps avoid hospital visits for IVF
• Empowers hydration control
• Can be used proactively
• Over-the-counter
• FAST, EFFECTIVE, RELIABLE
Appendix
Sodium Glucose Co-Transport System

Proteins in jejunum instantly transport sodium and glucose in precise ratio across epithelial wall, creating osmotic pull.

- D5 1/2NS is a commonly used IV fluid for treating dehydration
- Low osmolarity is a hallmark of rapid absorption
- Citrate is a blood buffer and helps prevent acidosis

<table>
<thead>
<tr>
<th></th>
<th>H2ORS</th>
<th>D5 1/2 Normal Saline</th>
<th>WHO ORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osmolarity (mmo/L)</td>
<td>221</td>
<td>405</td>
<td>200-310</td>
</tr>
<tr>
<td>Dextrose (g/L)</td>
<td>10</td>
<td>50</td>
<td>10-20</td>
</tr>
<tr>
<td>Sodium (mEq/L)</td>
<td>61</td>
<td>77</td>
<td>60-90</td>
</tr>
<tr>
<td>Chloride (mEq/L)</td>
<td>61</td>
<td>77</td>
<td>50-80</td>
</tr>
<tr>
<td>Potassium (mEq/L)</td>
<td>16</td>
<td></td>
<td>15-25</td>
</tr>
<tr>
<td>Citrate (g/L)</td>
<td>1.7</td>
<td></td>
<td>1.5-2.3</td>
</tr>
<tr>
<td>Ph</td>
<td>4.5</td>
<td>4.4</td>
<td></td>
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</tbody>
</table>

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