Nutrition Intervention in Geriatric Dehydration

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NFS 563 Case Study Presentation

University of Rhode Island MS in Dietetics

April 15, 2017

Presentation Format

1. **Introduction**
2. **Presentation of the Clinical Case using the NCP***
    1. *Part 1: Assessment*
    2. *Part 2: Diagnosis*
    3. *Part 3: Intervention*
    4. *Part 4: Monitoring and Evaluation*
3. **Discussion**
    1. *Part 1: Disease Pathophysiology*
    2. *Part 2: Intervention Rationale*
    3. *Part 3: Medications*
4. **Conclusion**

*NCP=Nutrition Care Process

I. Introduction[a]

Healthy Individuals:

Hormonal Systems + Neural Circuits → Appropriate Thirst Cues → **Fluid Balance and Hydration**

+

Appropriate Fluid Ingestion Behavior

Older Adults:

IMPAIREMENTS IMPAIREMENTS

Hormonal Systems + Neural Circuits → Impaired Thirst Cues → **DEHYDRATION**

+

Impaired Fluid Ingestion Behavior

[a]Information adapted from Begg et al[1]

II. NCP Part 1: Assessment

Patient: EF	Age: 83	Sex: M	Wt: 80 kg	Ht: 1.65 m	Admit Dx: Generalized Weakness
Medical History: • Congestive Heart Failure (CHF) • **Coronary and Peripheral Artery Disease (CAD/PAD)** • Hypertension (HTN) • **History Cerebrovascular Accident (Hx CVA)** • Osteoarthritis (OA) • **Chronic Kidney Disease Stage III (CKD III)** • Depression • **Other Active Problems:** Hx recent “dysphagia” episodes, Hypoalbuminemia, Hypernatremia					
No surgical hx.					

II. NCP Part 1: Assessment

Present Medical Status:

- Unable to get out of bed one morning
- Consults placed for: Speech Therapy, Physical Therapy, and **Nutrition Services**

Pertinent Abnormal Lab Values:

- **White Blood Cell Count:** 10.23 – ↑(H) – Inflammation vs. Dehydration
- **Albumin: 3.1 g/dL –** ↓ (L) – OA inflammation vs. poor nutritional status
- **Sodium: 148 mmol/L** – ↑(H) – Dehydration due to “decreased thirst regulation” – per MD
- **Potassium: 3.2 mmol/L** – ↓ (L) – Deficient Dietary Intake vs. K-depleting diuretic
- **BUN 22 mg/dL:** Within Normal Limits
- **Creatinine: 1.6 mg/dL** – ↑(H) – Baseline 1.4. Elevation likely d/t Acute Kidney Injury on CKD3
- **Estimated GFR: 41.5 mL/min/1.73m^2** – ↓ (L) – Indicative of CKD3

II. NCP Part 1: Assessment

MEDICATIONS: A Case of Polypharmacy?

MEDICATION	MEDICATION TYPE	PATIENT INDICATION
Acetaminophen (Tylenol)	Analgesic	Arthritic Pain
ASA	Analgesic	Arthritic Pain or CVA/MI Prevention
Tramadol (Ultram)	Analgesic	Arthritic Pain
Amlodipine (Norvasc)	Antihypertensive	HTN
Furosemide (Lasix)	Antihypertensive	HTN and/or CHF fluid buildup tx
Tamsulosin (Flomax)	Antihypertensive	HTN
Carvedilol (Coreg)	Antihypertensive + CHF Treatment	HTN and/or CHF
Valsartan (Diovan)	Antihypertensive + CHF Treatment	HTN and/or CHF
Mirtazapine (Remeron)	Antidepressant	Depression
Sertaline (Zoloft)	Antidepressant	Depression
Beclomethasone (Flonase)	Anti-allergic Rhinitis	Allergic Rhinitis
Donepezil (Aricept)	Anti-Alzheimers	?
Nitroglycerin	Anti-angina	?
Ondansetron (Zofran)	Anti-nauseant/Anti-emetic	?
Pravastatin (Prevachol)	Antihyperlipidemic (also ↓ risk CV events)	Hx CVA
Vitamins D, B12, K-dur, ferrous sulfate (iron)		

II. NCP Part 1: Assessment

Social History:

- Retired
- Married
- Lives w/ Wife + Middle-Aged Daughter
  - Wife: Cardiac Surgery Feb. 2017 – unable to assist w/ ADLs
- Rolling walker, decreased mobility (knee pain)

Diet History:

- **Per EF:** No change in appetite
- **Per Wife and Daughter:** Noticeable decline + dysphagia episodes

Breakfast	Late Afternoon	HS Snack (Occasional)
Cereal (Cheerios) w/ Milk Banana Coffee (occasional) – black	Homecooked (i.e. spaghetti and meatballs) or McDonald's (Cheeseburger, Small Fry)	Greek yogurt OR Fruit (1 cup frozen pineapple, medium banana)
Fluids: Poor – 8-16 oz. (500 mL)/day → ½ water bottle + occasional 8 oz. coffee		

II. NCP Part 1: Assessment

Hospital Diet Info:

- Regular House (No Restrictions)
- Food Intake: 75-100% of 3 well-balanced meals/day
- Fluid: 0-25% ⚠

Nutritional Status:

- BMI: 28.9 kg/m^2=↓ mortality risk for older adults?[2]
- Weight Loss: 3% X 3 months=Insignificant
- Physical Assessment: Well-Nourished

Main Problem: Poor Fluid Intake/Clinical Dehydration

II. NCP Step 1: Assessment

- Energy Needs

AND EAL[3]:

30-40 kcal/kg for older adult males of healthy weight

Considerations: Increasingly less active, Healthy Weight (Slightly "Overweight")

- Protein Needs

AND Position Paper on Food and Nutrition for Older Adults[4]:

0.8 g/kg: Adequate

1-1.6 g/kg: Safe

Considerations: Acute Illness (Hospitalization)

30 kcal x 80 kg=2400 kcal
EF'S Energy Needs

1-1.1 g protein x 80 kg=80-88 g
EF's Protein Needs

II. NCP Step 2: Diagnosis

“Inadequate fluid intake (NI-3.1)

related to

Lack of desire to drink and decreased thirst perception

as evidenced by

Family members reporting poor fluid intake (< needs), hypernatremia (Na 148), and a BUN:Creatinine ratio of 13.75.”

II. NCP Step 3: Intervention

- To address patient's lack of desire to drink, the dietetic intern will inform nursing staff of ways to increase the patient's prandial and post-prandial fluid intake, including placing the drink in an easily accessible location with a straw, regularly encouraging fluid intake during prandial periods, and preventing hostesses from removing the beverage with removal of the food tray. (ND-4.3, ND-5.6, RC-1.4)

- The dietetic intern will educate patient's family on strategies to improve patient's fluid intake in the home. (E-2.2)

II. NCP Step 3: Intervention

Short-Term Goals:

- Patient will drink **at least three, 8 oz. cups** of ordered fluid/day for the remainder of his hospital stay (**24 oz. beverage fluids/day**).
- Patient's wife and daughter will be able to verbally repeat 3 ways to facilitate improved fluid intake for the patient in the home setting by the time of discharge.

Long-Term Goals:

- Through continuation of familial support strategies, patient will regularly consume at least 1 liter of water (as recommended by his nephrologist) each day by 3 months post discharge.

Patient Understanding/Compliance?

II. NCP Step 4: Monitoring and Evaluation

- **Fluid Intake – per Nursing**

- **Labs**
  - **BUN**
  - **Creatinine**
  - **Sodium**

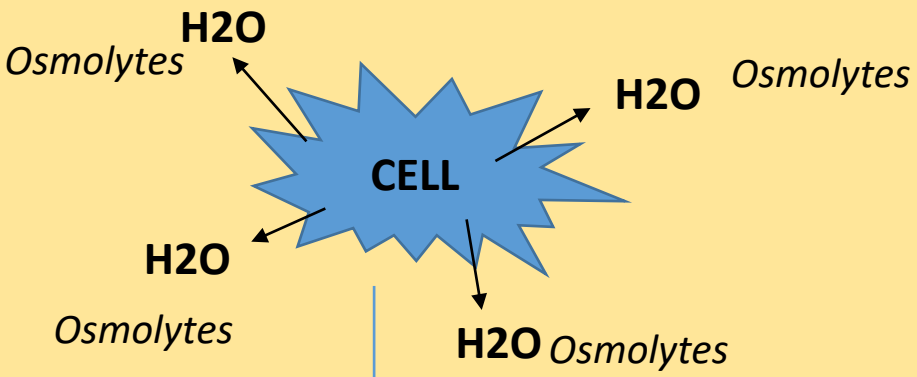
- **Education Comprehension – Verbal Teach-back**

III. Discussion Part 1: Pathophysiology

The Physiology of Thirst[a]

2 Potential "Triggers"

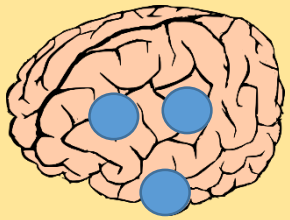
1) Extracellular Hyperosmolality



2) Hypovolemia

BARORECEPTORS
(venous walls, R atrium of ♥)

Renin-Angiotensin System (RAS)



PHYSIOLOGICAL THIRST
+
SENSATION OF THIRST

FLUID INGESTION BEHAVIOR

[a]Information adapted from Begg et al[1]

III. Discussion Part 1: Pathophysiology

The Physiology of Thirst[a,b]

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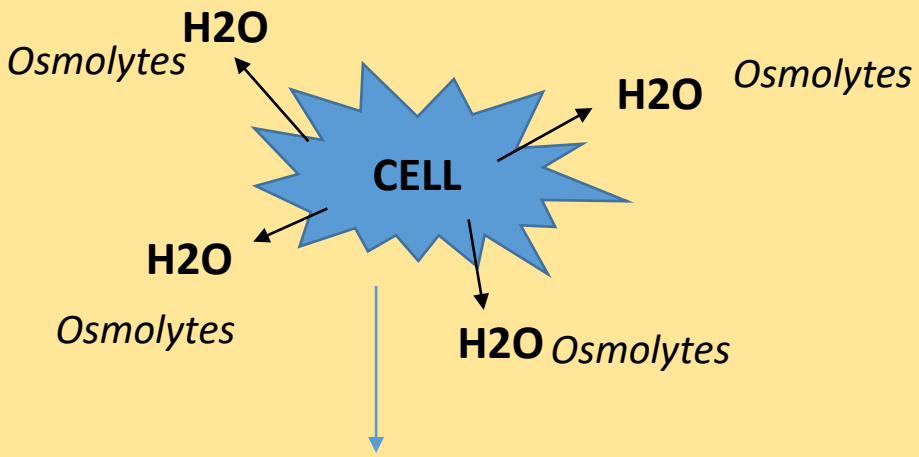

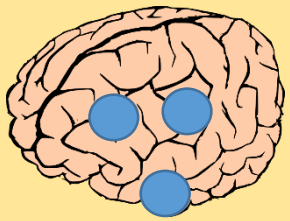

PHYSIOLOGICAL THIRST
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SENSATION OF THIRST

FLUID INGESTION BEHAVIOR

[a]Information adapted from Begg et al[1]
[b]Studies demonstrating decreased thirst perception/fluid ingestion in older adults[5-7]

III. Discussion Part 1: Pathophysiology

The Physiology of Thirst[a]

2 Potential "Triggers"

BARORECEPTORS
(venous walls, R atrium of ♥)

Renin-Angiotensin System (RAS)

PHYSIOLOGICAL THIRST
+
SENSATION OF THIRST

FLUID INGESTION BEHAVIOR

[a]Information adapted from Begg et al[1]
[b]Studies demonstrating barorecptor[8] and RAS[9] impairments

III. Discussion Part 2: Intervention Rationale

- **Oates et al[10]: (Narrative Systematic Review)**
  - "Providing extra opportunities to drink, such as prompts, preference elicitation, and routine beverage carts appeared to support hydration maintenance…"
  - "…no strong evidence that increasing awareness [of fluid requirements and risk factors among staff] alone would be beneficial for patients

- **Marra et al[11]: (Cross-Sectional Study)**
  - Metabolic oxidation of food=null effect on hydration
  - RDNs should assess the efficacy of interventions designed to promote increased fluid ingestion (rather than working to prevent or reverse dehydration, which "requires intervention by multiple stakeholders")

III. Discussion Part 3: Medications – A Case of Polypharmacy[a,b]

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Beclomethasone (Flonase)	Anti-allergic Rhinitis	Allergic Rhinitis
Donepezil (Aricept)	Anti-Alzheimers	?
Nitroglycerin	Anti-angina	?
Ondansetron (Zofran)	Anti-nauseant/Anti-emetic	?
Pravastatin (Prevachol)	Antihyperlipidemic (also ↓ risk CV events)	Hx CVA
Vitamins D, B12, K-dur, ferrous sulfate (iron)		

[a]Polypharmacy information from Maher et al[12]
[b]Side effect information from Pronsky et al[13]

IV. Conclusion

M&E Results:

- **Per Nursing:** 18 oz. fluid/day x 2 days
- **Labs WNL**
  - Creatinine: 1.17
  - Sodium 143
- **Verbal teach-back:** Successful

IV. Conclusion

Future Cases – Insights from the Recent Research:

- **Peyrot des Gachons et al (2016)[14]:**
  - **Room-temperature, non-carbonated beverages for dehydrated elderly**
    - =↑ fluid intake compared to cooled, carbonated beverages
    - "No carbonation" diet order?
- **Jimoh et al (2015)[15]:**
  - **"Drinks Diary", or other self-reporting tools**
    - Equally effective/as effective as nurse reports?

Future Research Warranted!:

- Pathophysiology of Decreased Thirst Perception: Inconclusive
- Studies assessing strategies to ↑ fluid ingestion in elderly
  - Especially in <u>inpatient</u> populations!

IV. Conclusion

Colleague Opinions Wanted!:

- Did not make a malnutrition diagnosis. **Should I have used the Mini-Nutritional Assessment?**
- Thoughts on **measuring urine output as marker of hydration?**
- **Dysphagia issue:** should I have investigated more?
- **Fluid goal from intervention:** too low? (24 oz./day?)

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