Overview of Presentation

- Introduction to JA
- Disease Information & ROS
- Laboratory Findings
- Analysis of Dietary Intake
- NCP- PES Statements
- Nutrition Rx
- Intervention
- Monitoring & Evaluation
- Conclusion
Meet JA - Pt Details

- Male
- Hispanic
- Bilingual
- 8 years old (DOB 1/14/10)
- W = 53 lb (24.09 kg)
- H = 49 in
- BMI 15.52 – “Healthy BMI for Age”
- 38th percentile BMI-for-age
- Below the 50th percentile
- Height and Weight along his normal growth curve
Stature-for-age

2 to 20 years: Boys

JA falls in the 10th percentile stature-for-age

(Medscape, 2011)
Weight-for-age
2 to 20 years: Boys

JA falls in the 20th percentile weight-for-age
JA's Social History

- June 2018 - Family Move
- Mother & Father are married
- Sister (6) & Brother (14 months)
- Reside in residential neighborhood
- No signs of FI in the last 12 months
- Mother & Father purchase & prepare his meals
- Good student & enjoys school
- Enjoys sports
- 2 hours or less of screen time/day during week
JA’s Disease Information

Medical History

- Unilateral Kidney Agenesis
- CKD Stage 1
- Anaphylactic Dairy Allergy
  - Casein
  - Whey
- Apraxia of Speech
- Sensory Processing Disorder
- Attention Deficit Hyperactivity Disorder
JA’s Review of Systems

**Review of Systems**

- Self Feeding with Standard Utensils
- No Abnormal Cravings
- Normal Bowel Movements
- Urination 2-3 times/hour
- 7-9 Hours of Sleep
- Feels Rested in the morning
JA's Laboratory Findings

1. Complete Blood Count (CBC)

2. Comprehensive Metabolic Panel (CMP)
   - Elevated BUN (20 mg/dL)
   - Normal Creatinine (0.6 mg/dL)
   - GFR (92 mL/min)

3. Complete Urinalysis (UA)
   - Protein (high)
   - Ur microalbumin – Slightly elevated
   - Albumin/Creatinine Ratio- high-normal
Renal Sonogram Results

- Left renal structures missing.
- Compensatory right renal hypertrophy measuring 12 cm.
- No hydronephrosis.
- Bladder normal with single ureter insertion from right kidney.
- No left ureter.
- No nephrolithiasis.
- No masses evident.
- Adrenal gland normal.
Considerations for Nutritional Status

In short, for a “healthy” 8-year-old JA has a lot going on...
Left Kidney Agenesis & CKD Stage 1
Inadequate Fluid Intake

Severe Dairy Allergy
Protein, Calcium, Riboflavin, Phosphorus, Vitamins A, D, B12

Sensory Processing Disorder
Food selectivity and sensory sensitivity
JA's Diet History

- Severe Dairy Allergy – Dairy Free
- 3 mg melatonin every other day (sleep aid)
- Family Meals or School Meals at table
- Hydration- 10:15 oz bottles of water daily
- Meal Cycle- 3 meals daily
  - 7:30 am- Breakfast
  - 11 am- Lunch
  - 4 pm- Snack
  - 6 pm Dinner
24-hour recall

(Multi-pass reported by JA's Mother)
<table>
<thead>
<tr>
<th>Date:</th>
<th>Quick Pass</th>
<th>Forgotten (Portions, Brands, Sizes, Drinks)</th>
<th>Time &amp; Occasion</th>
<th>Detailed (Preparation)</th>
<th>Final Probe</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Oct</td>
<td>Boiled Egg</td>
<td>1 Egg - Size Large</td>
<td>Typical Breakfast</td>
<td>Hard boiled - Plain</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>Pop Tart</td>
<td>Whole packet- Strawberry</td>
<td></td>
<td>Toasted</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Orange Juice</td>
<td>1- 6 oz Simply Orange</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Banana</td>
<td>1- 6&quot; banana</td>
<td></td>
<td>Sliced</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ham</td>
<td>2 oz- Black Forest</td>
<td>Typical Lunch</td>
<td>Sliced</td>
<td>n/a</td>
</tr>
<tr>
<td>1-Oct</td>
<td>Vegan Cheese</td>
<td>1 -Daiya Vegan Cheese Slice</td>
<td></td>
<td>Sliced</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bread</td>
<td>2 pc- Arnold Natural Bread</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mayo</td>
<td>1 T- Hellman's Real Mayo</td>
<td></td>
<td>Sliced &amp; Toasted</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kind Bar</td>
<td>1- Almond &amp; Coconut</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pretzels</td>
<td>0.5 Serving (3 pretzel rods) - Newman's</td>
<td></td>
<td>Plain</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Veggie Chips</td>
<td>1 Serving (1 bag) - Sensible Portions</td>
<td></td>
<td>Plain</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1- 12 oz water</td>
<td></td>
<td>Filtered Water</td>
<td></td>
</tr>
<tr>
<td>1-Oct</td>
<td>Belvita Chocolate</td>
<td>1 pk belvita cookies</td>
<td>Typical Snack</td>
<td>(pack w 4 cookies)</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>Cookies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1- 12 oz water</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-Oct</td>
<td>White Rice</td>
<td>1 C Cooked - Medium Grain, 1 C Cooked</td>
<td>Typical Snack</td>
<td>Rice Cooker: Pinch of Salt, 1/2 T Oil (Vegetable)</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>Ground Beef</td>
<td>3/4 C (80/20) ground beef</td>
<td></td>
<td>Sautéed 1/2 T oil</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1- 12 oz water</td>
<td></td>
<td>1/8 t Salt</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Filtered Water</td>
<td></td>
</tr>
<tr>
<td>2-Oct</td>
<td>Boiled Egg</td>
<td>Size Large</td>
<td>Typical Breakfast</td>
<td>Hard boiled - Plain</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>Pop Tart</td>
<td>Whole packet- Strawberry</td>
<td></td>
<td>Toasted</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Banana</td>
<td>1-6&quot; banana</td>
<td></td>
<td>Sliced</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1- glass almond milk (6 oz)</td>
<td></td>
<td>Brand - Silk</td>
<td></td>
</tr>
</tbody>
</table>
Energy and Fluid Requirements

- 2,144-2,149 kcal/d
  - Very Active

- Min Fluid Requirements
  - Holliday-Segar Method (The Johns Hopkins Hospital, 2018)

<table>
<thead>
<tr>
<th></th>
<th>@ mL/Kg</th>
<th></th>
</tr>
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<tbody>
<tr>
<td>First 10 kg</td>
<td>100</td>
<td>1000 mL</td>
</tr>
<tr>
<td>Second 10 kg</td>
<td>50</td>
<td>500 mL</td>
</tr>
<tr>
<td>Each Additional kg</td>
<td>20</td>
<td>80.01 mL</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1,580.1 mL or about 1.6 L/day</td>
</tr>
</tbody>
</table>
Nutrient Analysis
<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Total</th>
<th>Min Range</th>
<th>Max Range</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories</td>
<td>2411</td>
<td>2144</td>
<td>2149</td>
<td>kcal</td>
</tr>
<tr>
<td>Sugar</td>
<td>105.3</td>
<td>0</td>
<td>25</td>
<td>g</td>
</tr>
<tr>
<td>Protein</td>
<td>84.9</td>
<td>0</td>
<td>23</td>
<td>g</td>
</tr>
<tr>
<td>Fat</td>
<td>99.1</td>
<td>51</td>
<td>71</td>
<td>g</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>36.7</td>
<td>0</td>
<td>18.8</td>
<td>g</td>
</tr>
<tr>
<td>Trans Fat</td>
<td>4.8</td>
<td>0</td>
<td>0</td>
<td>g</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>351.2</td>
<td>0</td>
<td>250</td>
<td>g</td>
</tr>
<tr>
<td>Niacin</td>
<td>36.7</td>
<td>8</td>
<td>15</td>
<td>mg</td>
</tr>
<tr>
<td>Sodium</td>
<td>3856.1</td>
<td>1200</td>
<td>1900</td>
<td>mg</td>
</tr>
<tr>
<td>Fiber</td>
<td>13.8</td>
<td>25</td>
<td>50</td>
<td>g</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>1.7</td>
<td>15</td>
<td>75</td>
<td>mcg</td>
</tr>
<tr>
<td>Vitamin E</td>
<td>5.9</td>
<td>7</td>
<td>300</td>
<td>mg</td>
</tr>
<tr>
<td>Potassium</td>
<td>1428</td>
<td>3800</td>
<td>4000</td>
<td>mg</td>
</tr>
<tr>
<td>Calcium</td>
<td>706.3</td>
<td>1000</td>
<td>2500</td>
<td>mg</td>
</tr>
<tr>
<td>Potassium</td>
<td>2169.6</td>
<td>3800</td>
<td>ND</td>
<td>mg</td>
</tr>
<tr>
<td>Carbohydrate</td>
<td>296.9</td>
<td>206</td>
<td>298</td>
<td>g</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>514.4</td>
<td>400</td>
<td>900</td>
<td>mcg</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>124.5</td>
<td>25</td>
<td>650</td>
<td>mg</td>
</tr>
<tr>
<td>Thiamin</td>
<td>1.6</td>
<td>0.6</td>
<td>2</td>
<td>mg</td>
</tr>
<tr>
<td>Riboflavin</td>
<td>1.6</td>
<td>0.6</td>
<td>2</td>
<td>mg</td>
</tr>
<tr>
<td>Folate</td>
<td>275.9</td>
<td>200</td>
<td>400</td>
<td>mcg</td>
</tr>
<tr>
<td>Vitamin B6</td>
<td>1.9</td>
<td>0.6</td>
<td>40</td>
<td>mcg</td>
</tr>
<tr>
<td>Vitamin B12</td>
<td>4.2</td>
<td>1.2</td>
<td>5</td>
<td>mcg</td>
</tr>
<tr>
<td>Iron</td>
<td>14.6</td>
<td>10</td>
<td>40</td>
<td>mg</td>
</tr>
</tbody>
</table>

(Dietitians of Canada, 2018).
**Fluid Intake**

<table>
<thead>
<tr>
<th>Meal</th>
<th>Beverage</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td>Orange Juice</td>
<td>6 oz</td>
</tr>
<tr>
<td>Lunch</td>
<td>Water</td>
<td>12 oz</td>
</tr>
<tr>
<td>Snack</td>
<td>Water</td>
<td>12 oz</td>
</tr>
<tr>
<td>Lunch</td>
<td>Water</td>
<td>12 oz</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>42 oz</strong></td>
</tr>
</tbody>
</table>

Calculated Fluid needs suggest: **1.6 L/day**

Mom reports 10 – 15 oz bottles of fluid per day: **5.1 L per day**

Actually consumed: **1.2 L/day**

\[ \sim 1,235 \text{ mL or } 1.2 \text{ L/day} \]
Left Kidney Agenesis & CKD Stage 1

Inadequate Fluid Intake ✔

Severe Dairy Allergy
Protein, Calcium ✔, Riboflavin, Phosphorus, Vitamins A, D ✔, B12

Sensory Processing Disorder
Food selectivity and sensory sensitivity ✔
Nutrition Care Process PES #1

P Excessive Sodium intake

Related to

E overconsumption of a limited variety of processed foods (dairy allergy)

As evidenced by

S estimated intake in 24 hour recall containing high amounts of sodium in excess of 3,800 milligrams compared to reference intake standard of 1,200 mg for appropriate age group.
PES #1 Intervention

1. Parent education of high-sodium foods and snacks
2. Providing lower sodium substitutions
3. Decreasing Sodium initially to 2,500 milligrams in 2 weeks,
4. Aim to have his intake under 1,200 milligrams in 6-8 weeks.
1. Sodium intake levels will be monitored bi-weekly
2. 24 hour recall in office, patient portal or over phone
3. Assess that JA is making adequate changes with tolerance
4. Decreasing intake to meet his 1,200 mg per day sodium goal.
Nutrition Care Process PES #2

P - Food and Nutrition Related Knowledge Deficit

Related to

E - incomplete or inaccurate knowledge of nutrition related information and guidelines for children (with dairy allergies)

As evidenced by

S - Deficiencies in calcium (<2500 mg) and vitamin D (<75 mcg) intake per 24 hour recall.
PES #2 Intervention

1. Parent education of dairy-free foods and beverage choices

2. Providing substitutions rich in calcium and vitamin D to meet DRI’s for age group.

3. Agree on substitutions in first visit, implement changes for meeting in 2 weeks.

4. Aim to meet minimum DRI for age calcium (<2500 mg) and vitamin D (<75 mcg).
PES #2 Monitoring & Evaluation

1. 24 hour recalls will continue with RDN,

2. noting patient preference to substitutions.

3. If Calcium and Vitamin D intake levels have not made any change over the course of 6 – 8 weeks, supplementation may be an option to discuss with primary care provider.
Conclusion

- 8 y/o Hispanic male 49” in height, 53 lb in weight and BMI of 15.52 a “healthy BMI-for-age
- Medical Dx: URA, Dairy Allergy, Apraxia of speech, SPD, ADHD
- Labs: Elevated Protein in urine, BUN is slightly elevated as well as GFR but these have not changed since previous visit.
- Nutrition Concerns: Hydration, Micronutrient Deficiencies and lack of variety
- Nutrient Analysis: 24 hour recall
- Overconsuming processed snacks due to aversion of dairy/ SPD
- Under consuming Calcium and Vitamin D (food allergy)
- Interventions: parent education, higher nutrient quality foods & Vitamin D and Calcium products.
- Other recommendations may include increasing fluid intake and improving fiber and potassium intake with fruit and vegetables.
Thanks!

Any questions?

You can find me at:
hwreymunde@m.marywood.edu
References


