Disclosures

• Seed funding: Epilepsy Foundation of Greater Los Angeles and The Charlie Foundation
• Programmatic funding: The Carley Eissman Foundation
Objectives

By the end of this presentation, participants will be able to:

• Identify the key differences between the Classic Ketogenic Diet and the Modified Atkins Diet
• Assess individual patients educational needs in order to develop appropriate objectives and intervention
• Translate interventions to practical skills in the kitchen
In the beginning...

Pioneer Patients at John Hopkins

• 9 year old boy
  • Classic ketogenic diet since 5 years old
  • Classic ketogenic diet was efficacious but difficult due to behaviors
  • Mother independently switched to the Atkins Diet and they found:
    • Maintained ketosis and thus seizures remained under control
    • Less battles around food and less cheating

• 7 year old girl
  • Patient history:
    • 70-80 seizures daily
    • Failed 8 anticonvulsants
  • 1 month away from week-long admission for diet initiation
  • John Hopkins suggested: reduce highly concentrated carbohydrates
  • Mother requested: additional information on reducing carbohydrates
  • John Hopkins provided Dr. Atkins’ New Diet Revolution on Friday → by Monday her seizures had completely stopped
This brought up a couple of questions

- Liberalize without jeopardizing efficacy?
- Liberalize reducing risk for side effects?
- Reduce cheating with improved palatability?
- Improve adherence with more autonomy?
- Choosing one over the other?
Side-by-Side

Ketogenic\(^2,3\)
- Efficacy
  - >50%: 50-75%
  - >90%: 25-35%
- Retention: 63% (8mo)
- Early Termination:
  - Inefficacy: 63-84%
  - Restrictive: 18-25%
  - Illness: 7-12%

Modified Atkins\(^4,5\)
- Efficacy
  - >50%: 45-64%
  - >90%: 28-35%
- Retention: 47% (6mo)
- Early Termination:
  - Inefficacy: 56%
  - Restrictive: 38%
**Side-by-Side**

**Ketogenic**
- Initiation: inpatient
- Ketosis: yes
- kCal: controlled
- Macronutrients
  - Protein: RDA
  - Ketogenic Ratio:
    - Fat(g) \div [Protein(g) + Net CHO(g)]
  - Regulates ketosis

**Modified Atkins**
- Initiation: outpatient
- Ketosis: yes
- kCal: no restriction
- Macronutrients
  - Fat: encouraged
  - Protein: no restriction
  - CHO:
    - 1st month: 10-15g
    - After: 20-30g

Keck School of Medicine of USC
Side-by-Side

**Ketogenic**
- Pros:
  - Concrete instructions
  - Detailed instructions
- Cons:
  - Reliance on gram scale
  - Restrictive
  - Limited autonomy
  - Limited creativity

**Modified Atkins**
- Pros:
  - Autonomy
  - Creativity
  - More CHO allotted
  - Family meals
- Cons:
  - Self-monitoring
  - Less guidance
Johns Hopkins MAD Protocol

- Book: *Dr. Atkins’ New Diet Revolution*
- Carbohydrates in 1\textsuperscript{st} month:
  - Restricted to 10g per day
  - Low-carbohydrate, store-bought products discouraged
- Fats: encouraged
- Fluids: clear, carbohydrate-free, not restricted
- Vitamin and mineral supplementation:
  - Multivitamin
  - Calcium with vitamin D
- Keeping a calendar:
  - Daily seizure activity
  - Semi-weekly urinary ketones
  - Weekly weights
- Medications: unchanged for at least the 1\textsuperscript{st} month
- Follow-Up: 1, 3 and 6 months on the diet
- Laboratory monitoring:
  - Baseline, 3 and 6 months: CBC, CMP, fasting lipid profile
  - 3 and 6 months: urine Ca++ and urine creatinine
Putting it into Practice: the clinic

- **Step 1: Pre-MAD**
  - Expectations for seizure control
  - Discuss nutrition goals
  - Encourage eliminating concentrated CHO food sources

- **Step 2: Educate on MAD**
  - Macronutrients: what comes from where?
  - Counting carbohydrates:
    - Total versus net carbohydrates
    - Reading a nutrition label
    - Relevant and reputable apps and websites
  - Fluids: what can I drink?
  - Examples: standard daily menus
  - Recommend vitamin/mineral supplementation
  - Preventing, recognizing and treating side-effects
  - Sick day and admission protocols
Imagine: you were just educated
Translation: clinic to kitchen
Translation: confounding variables

- Skill set in the kitchen
- Time to prepare meals
- Additional expenses
- Food and identity


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<tr>
<td>Male</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
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<tr>
<td>Female</td>
<td>28.6</td>
<td>1.6</td>
<td>29.1</td>
<td>1.3</td>
<td>46.8&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>1.6</td>
<td>38.3&lt;sup&gt;a&lt;/sup&gt;</td>
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<td></td>
<td>92.3</td>
<td>0.8</td>
<td>88.4&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>0.8</td>
<td>84.7&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>1.1</td>
<td>67.3&lt;sup&gt;ab&lt;/sup&gt;</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Low</td>
<td>67.6</td>
<td>3.2</td>
<td>69.8&lt;sup&gt;c&lt;/sup&gt;</td>
<td>3.2</td>
<td>65.5</td>
<td>3.0</td>
<td>58.1</td>
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<tr>
<td>Middle</td>
<td>62.7</td>
<td>1.6</td>
<td>61.7</td>
<td>1.4</td>
<td>67.1&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.5</td>
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<tr>
<td>High</td>
<td>59.3</td>
<td>2.1</td>
<td>58.2&lt;sup&gt;c&lt;/sup&gt;</td>
<td>1.7</td>
<td>68.4&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>1.8</td>
<td>49.6&lt;sup&gt;ab&lt;/sup&gt;</td>
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</tbody>
</table>
Translation: kitchen skills

- Not well-studied, but we do know:
  - In UK, 10% cite that not knowing how to cook limits their food choices\textsuperscript{8}
  - Survey NAMI, 1996\textsuperscript{9}
    - Less knowledge: 53%
    - Same knowledge: 30%
    - More more knowledge: 16%
- Possible etiology\textsuperscript{8-10}:
  - The rise of convenience foods
  - 2 working parents or single parent
  - Decline of ‘home economics’
Translation: time

Time use on an average work day for employed persons ages 25 to 54 with children

Caring for others (1.2 hours)
Eating and drinking (1.0 hours)
Household activities (1.0 hours)
Leisure and sports (2.5 hours)
Working and related activities (8.9 hours)
Sleeping (7.7 hours)
Other (1.6 hours)

NOTE: Data include employed persons on days they worked, ages 25 to 54, who lived in households with children under 18. Data include non-holiday weekdays and are annual averages for 2014. Data include related travel for each activity.

• Most-cited reasons for not cooking regularly\textsuperscript{12,13}:
  • Spouse/partner cooks: 51%
  • Not want to clean afterwards: 25%
  • Not having enough time: 21%
<table>
<thead>
<tr>
<th>Food</th>
<th>Amount</th>
<th>Expense</th>
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<tr>
<td>Cheerios</td>
<td>1 cup</td>
<td>$0.15</td>
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<tr>
<td></td>
<td></td>
<td>($3.70/box)</td>
</tr>
<tr>
<td>Milk, 2%</td>
<td>1 cup</td>
<td>$0.18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>($2.89/gallon)</td>
</tr>
<tr>
<td>Banana</td>
<td>1 small</td>
<td>$0.15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>($0.69/lb)</td>
</tr>
</tbody>
</table>

Calories: 331  
Fat: 7.1g  
Protein: 12.2g  
CHO: 54.7g  
Ratio: 0.1:1  
Cost: $0.48

<table>
<thead>
<tr>
<th>Food</th>
<th>Amount</th>
<th>Expense</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy Cream, 36%</td>
<td>20g</td>
<td>$0.14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>($3.18/pint)</td>
</tr>
<tr>
<td>Sausage, Johnsonville Original Breakfast Link</td>
<td>10g</td>
<td>$0.20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>($5.19/package)</td>
</tr>
<tr>
<td>Egg, raw, mixed well</td>
<td>32g</td>
<td>$0.22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>($4.09/dozen)</td>
</tr>
<tr>
<td>Butter</td>
<td>20g</td>
<td>$0.32</td>
</tr>
<tr>
<td></td>
<td></td>
<td>($3.59/package)</td>
</tr>
<tr>
<td>Mango (10% Fruit)</td>
<td>17g</td>
<td>$0.22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>($2.79/fruit)</td>
</tr>
</tbody>
</table>

Calories: 300  
Fat: 29.01g  
Protein: 6.76g  
CHO: 2.9g  
Ratio: 3:1  
Cost: $1.01
Translation: food & identity

“Tell me what you eat and I’ll tell you who you are.”
-- Jean Anthelme Brillat-Savarin, 1825

• Anthropological perspective\textsuperscript{17}:
  • Ethnic
    • Relating to a populations subgroup with a common national or cultural tradition
  • Religious
    • Communicating with God
    • Demonstrating faith
    • Developing discipline
  • Social class
    • Studies suggest that energy-dense foods and energy-dense diets may predispose the consumer to overeating
Translation: food & identity

• Social perspective:\n  • Adults
    • Social events (i.e. marriages, meetings)
    • Developing social rapport (i.e. friends)
    • Personal expression (i.e. parent, business, leisure)
  • Children
    • Influencers (i.e. admired adults, fictional characters)
    • Social conscious (i.e. peer pressure)
Translation: food & identity

  • Population: 12 parents from 10 families
  • Findings → “themes”
    • Food as medicine
    • Fat as good
    • Food as a symbol of inclusion
    • Food as a symbol of love
  • Limitations:
    • Small sample size
    • Qualitative
    • Population:
      • Good response to diet
      • Top quartile earners from two-parent families
Transitioning to the Kitchen

Connecting Families

Kitchen Gadgets

Comfort Foods
Transition to the Kitchen: connections

- Patient-to-Patient:
  - Receive permission
  - Like families; similar ages and situations
- Online Support Groups: Yahoo!
- Foundations:
  - The Charlie Foundation
  - The Carley Eissman Foundation
  - The Carson Harris Foundation
- Ultimate goal:
  - Decrease isolation
  - Provide support
Transition to the Kitchen: kitchen gadgets

• Why?
  • Save time for food preparation
  • Takes the annoyance out of mundane tasks
  • Help keep kitchen clean and in order
  • Fun, interactive and buy-in
• Downside = additional expense
Transition to the Kitchen: kitchen gadgets

- Small appliances
  - Blender
    - To make:
      - Smoothies
      - Sauces
      - Nut butters
  - Food Processor
    - To make:
      - Faux rice
      - Faux mashed potatoes
Transition to the Kitchen: kitchen gadgets

• Slicers
  • To make:
    • Noodles
    • Strips
    • Thin slices
    • Finely chopped
  • Tools:
    • Spiralizer
    • Mandoline
Transition to the Kitchen: kitchen gadgets

- Molds
  - To make:
    - Fat bombs
    - Candies
    - Popsicles
  - Tools:
    - Silicone ice cube molds
    - Popsicle molds
    - Mini cupcake tray
Transition to the Kitchen: kitchen gadgets

- Storage – lunch
  - Bento box
    (resembles Lunchables)
    - Multi-compartment containers
    - Silicone cupcake molds
    - Tooth picks
    - Cookie cutters
    - Boiled egg molds*
    - Sandwich stamp*
    - Vegetable cutters*
  - Fun lunch boxes

*Brands: CuteZCute, Bambino Love, BentoUSA,
Transition to the Kitchen: comfort foods

• Question - why do we eat?
• Comfort foods\textsuperscript{20}:
  • Foods that people consume in order to attain psychologically comfortable or pleasant state
  • Classically high in sugar and fat
• What we know:
  • Social context\textsuperscript{18}: often consumed when specific circumstances elicit a desire for consumption
  • Physiological context\textsuperscript{21}: activates hypothalamic-pituitary-adrenal axis
Transition to the Kitchen: comfort foods

- Nostalgic
- Indulgence
- Convenience
- Physical

FAMILIAR
Transition to the Kitchen: comfort foods

- Sauces and Dips
  - Easy way to incorporate fat
  - Ideas:
    - Alfredo
    - Ranch
    - Aioli
    - Pesto
    - Browned Butter
    - Hollandaise
    - Tartar
    - Cheese
Transition to the Kitchen: comfort foods

• Versatile vegetables: low carb
  • Cauliflower
    • Rice
      • Pizza crust
      • Tater tots
      • Risotto
  • Mashed potatoes
    • Hummus
  • Buffalo wings
  • Hominy
Transition to the Kitchen: comfort foods

- Versatile vegetables: low carb
  - Zucchini
    - Noodles
      - Scampi
      - Spaghetti
      - Lasagna
      - Pad Thai
    - Pizza crust
  - Enchiladas
  - Fries
  - Chips
Transition to the Kitchen: comfort foods

• Familiar foods
  • Pizza crust
    • Base\textsuperscript{15}
      • Cauliflower (1 cup = 3.5g net CHO)
      • Zucchini (1 cup = 3.0g net CHO)
      • Flax seed (1/4 cup = 2.7g net CHO)
      • Cream cheese (2oz = 2.0g net CHO)
  • Binding agents
    • Parmesan cheese
    • Eggs
Transition to the Kitchen: comfort foods

• Familiar foods
  • Tacos
    • Lettuce
    • Cheese taco shells
  • Tamales or Pupusas
    • Baby corn masa$^{15}$
      • Baby corn, 2 cans (12.2g net CHO)
      • Coconut flour, ¼ cup (6 net CHO)
      • Lard or Coconut oil, >2tbsp
      • Spices
Transition to the Kitchen: comfort foods

• Familiar foods
  • Desserts
    • Jell-O
    • Sherbet
    • Cheesecake
    • Popsicles
    • Ice pops
    • Nut butter cups
    • Chocolate cake
    • Chocolate covered nuts
Making life easier: snacks

- Pork rinds:
  - Sour cream (or crème fraîche)
  - Guacamole

- Celery:
  - Nut butters
  - Cream cheese

- String cheese
  - Wrapped in bacon
  - Ranch dip

- Moon cheese
- Olives
- Nuts
Transition to the Kitchen: comfort foods

• Making life easier: low carbohydrate products
  • Breads
    • Sandwiches
      • Grilled cheese
      • BLTs
      • PB&J
  • Breakfast
    • French toast
  • Dessert
    • Bread pudding

Mahler’s CA Lifestyle
1g net CHO per slice
$4.99/24oz

Julian’s Paleo Bread
1g net CHO per slice
$8.99/24oz
Transition to the Kitchen: comfort foods

• Making life easier: low carbohydrate products
  • Tortillas
    • Tostadas
    • Tacos
    • Taquitos
    • Quesadilla
    • Wraps
    • Pizza
    • Chips
      • Nachos
      • Guacamole
Transition to the Kitchen: comfort foods

- Making life easier: low carbohydrate products

Cheeky Chia Seed Chocolate\(^{25}\)
1g CHO per square

Lily’s Dark Chocolate\(^{26}\)
1g CHO per 10 morsels

SugarLeaf: 1tsp = 3.6g CHO\(^{27}\)
Pure raw cane sugar, Stevia

Swerve: 1tsp = 5g CHO\(^{28}\)
Erythritol, Oligosaccharides, Natural flavors
We should also be asking...

- Accessibility to food and grocery stores?
- Comfort level and skill in the kitchen?
- What is important to the family?
Putting it into Practice: the clinic

- Additional education & materials to provide:
  - How much?
    - Net carbohydrate in grams
    - Fat in tablespoons
    - Estimate proteins using “rule of thumb”
      - Proteins in exchanges, but disregard lean/medium/high fat
  - “Knowledge is no value unless you put it into practice” — Anton Chekhov
    - Provides patient specific daily meal plan examples
    - Practice developing simple meal plans
- Ideas for non-food rewards
- Recipes
  - Social gathering
  - Special occasions
- Grocery list
  - Variety of fats
  - Low CHO products; include CHO counts
  - Stores near home with specialty products
Challenges & Solutions

• Limiting factor = RD time
  • Billable v non-billable
  • FTEs
    • Multiple clinics
    • Multiple jobs
  • Patient load
• Resolution = sharing
  • Recipes
  • Education materials
  • Seminars and journal clubs
Take Home Messages

“You never really understand a person until you consider things from his point of view – until you climb into his skin and walk around in it.”

-- Harper Lee

- Visiting caregiver and child perspective is important to:
  - Optimize our educational practices
  - Build rapport with families
- Modified Atkins Diet can be a fun and palatable option in an effort to pursue seizure control
References

References