Navigating Diabetes Education

Self-management Classes

Publicity

Support Group

Community Outreach

Intervention Events

Research & QC

1st ADA certified in Texas

Under control: Pump helps farmer regulate his diabetes

Pump

Candes, Texas

Dreaded things right of the diabetes team at Scott & White.

"It may be the greatest thing or the world because it's so far for me. I mean I have been on the diabetes machines before, but this is definitely different. I think it is going to be a great addition to my life."

"And I think especially with the technology of the pump, it's going to be very helpful for me."

The pump allows for more flexibility and control over blood sugar levels.

American Diabetes Association Recognizes this education service as meeting the National Standards for Diabetes Self-Management Education.

Impact of ADA-Accredited Diabetes Education on Healthcare Utilization

Coined by: Diabetes educators at educational centers in the United States. Data from the American Diabetes Association (ADA) certification program. Data from the American Diabetes Association (ADA) certification program.

Background/Methods: Diabetes educators in educational centers in the United States. Data from the American Diabetes Association (ADA) certification program. Data from the American Diabetes Association (ADA) certification program.

Results: Diabetes educators in educational centers in the United States. Data from the American Diabetes Association (ADA) certification program. Data from the American Diabetes Association (ADA) certification program.
Role of RD on the Wound Care Team

• ADA/AADE recognize good nutrition as essential for diabetes and diabetes-related complications control

• Present nutrition recommendations for diabetic wound healing are based on small studies and expert opinion
  “there are no evidence-based nutrition therapy guidelines for diabetic wound care” – Nancy Collins, PhD, RD, LD/N, FAPWCA, founder and executive director of RD411.com and recognized authority on nutrition and wound care

• As RDs, we assess, individualize, and train each patient on nutrition needs & interventions based on such things as:
  – pressure ulcer stage
  – diet history/meal intake (how and what the patient usually eats)
  – complete history based on talking with patient, family, and clinical staff
  – patient /resident likes and dislikes
  – energy stores (calories), somatic protein stores, hydration, and vitamin and mineral status


“Patients who are at risk for the development of pressure ulcers should maintain adequate nutrition that is compatible with the patient’s wishes or condition to maximize the potential for healing.” – WOCN Guideline for the Prevention and Management of Pressure Ulcers
Up-front nutritional assessment

- Height, Weight, BMI
- Unintentional change in weight
- >5# in 1 month or >10# in 6 months
- >10 pounds in past 6 months
- Persistent or recurrent diarrhea
- Alcohol > 3 drinks per day
- Mouth, tooth or swallowing problems
- Tube feedings or TPN
- Limited access to food
- Missing 2 meals/day > 2 days/week
- Biochemical test results: serum levels of albumin, pre-albumin, c-reactive protein, total protein, transferrin, cholesterol, hemoglobin, vitamin B12, folate, iron, etc.
Carbohydrates are the main & first source of cellular energy during wound healing and, evenly distributed throughout the day, key to preventing fluctuations in blood sugar

- T2D: consistent ADA & AACE clinical studies link DSME group care on controlled carbohydrate diets as a key element to lower blood sugar levels
- T1D: among the few studies run in last 3 years, 2011 Reuters study found that those who learned to count carbs
  - had reduction in weight and waist size after 6 mos.
  - reported gains in quality of life
  - and at least for those who consistently counted their carbs with each meal – an improvement in blood sugar levels
- Carb Counting Sliding Scale (CSc) is being used for in-hospital care to determine insulin dose & control blood glucose level
Carb counting in practice

- Better blood glucose control thru dietary control: matches insulin to food choices
- Flexible: any food can fit
- Easy: focus on carbs, learn-ability across certified classes (1 mo., 6 mo. 12 mo.)

A longitudinal qualitative study examining the factors impacting on the ability of persons with T1DM to assimilate the Dose Adjustment for Normal Eating (DAFNE) principles into daily living and how these factors change over time, BMC Public Health 2011

6 weeks - DSME enabled informed choices at food & hypoglycaemic events
"Your doctor would say a long time ago, take a Mars bar, take a mouthful of l'oozade, at least I know now, not to take a full Mars bar, I know what a Mars bar is going to do, and that was through the course... before you actually take too much and have a hypo afterwards... I really know a lot more now."

6 months - CC seen as time-consuming/challenging at 1st
"I can calculate things like potatoes and things like that, but I mean it is a bit... it's a challenge to pick up a packet of something and get your reading glasses on... every packet you pick up is different, but I think probably the biggest challenge is when you're out socially, and you're just wondering what sort of a portion is going to come. And I found a few times that I've kind of miscalculated and then I've got to just take a few more units of quick-acting insulin."

12 months - Portions easier, more embedded for foods they ate
"Yes, I can gauge things better, and I can look at something and know how many carbohydrates and CPs are in that, and how many (units of) insulin's will I need to take to work the ratios."

"You get to judge the portion sizes except when you eat out, because they always give you bigger than what you'd give yourself. So in that respect, like, that's one thing that I do think has made a huge difference. It's just so much faster now because I know what I'm eating. I know what to take. I don't have to spend too much time."

2010 example study
Can children with diabetes and their caregivers estimate the carbohydrate content of meals and snacks?
- >100 children/adolescents (age 8-18) and their caregivers independently
- CHO content of 17 standardized meals
- Different DSME CC approaches (portion, gram increments, 15-g exchanges)

Results
- 75% of all estimates (n = 2530) within 10-15 g of actual CHO content
- Core foods in non-standard quantities most frequently inaccurately estimated
- Individually labeled foods most often accurately estimated

Conclusions
Children with diabetes and their caregivers can estimate the carbohydrate content of meals with reasonable accuracy. Teaching CHO counting in gram increments did not improve accuracy compared with CHO portions or exchanges. Large meals tended to be underestimated and snacks overestimated. Repeated education appears necessary to maintain accuracy in carbohydrate estimations.
Guidelines

- The recommended number of servings is based on patient weight, activity level, diabetes medicines, AND goals for blood glucose levels. A general guideline is to have
  - 3 or 4 servings of carbs at each meal (distributed throughout day)
  - 1 or 2 servings at each snack (good snacks)

<table>
<thead>
<tr>
<th></th>
<th>Weight Loss</th>
<th>Weight Maintenance</th>
<th>Very Active</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women</td>
<td>2-3 per meal</td>
<td>3-4 per meal</td>
<td>4-5 per meal</td>
</tr>
<tr>
<td>Men</td>
<td>3-4 per meal</td>
<td>4-5 per meal</td>
<td>5-6 per meal</td>
</tr>
</tbody>
</table>

- As dietitian or diabetes educators, we work with patients to
  - make a personalized meal plan and
  - teach them self-management practices for carb recognition (what counts), free foods, counting based on serving size & labels, food substitutions
What counts & doesn’t as carbs?

3-4 oz grilled salmon
2/3 cup wild rice
Broccoli & carrots
16 oz tea - unsweetened
What counts & doesn’t as carbs?

3-4 oz grilled salmon
2/3 cup wild rice
Broccoli & carrots
16 oz tea - unsweetened

Rice = 2 carb choices
Healing with Protein

• Provides the foundation for tissue growth, cell renewal, and repair resulting from a wound
• Preferred source is complete proteins, such as meat, poultry, fish, eggs, milk products, and soybeans
• Recommended 1.25–1.5 g/kg/day (EPUAP, NPUAP). For 150-lb male, this equates to 85-102 g of protein/day
• Be careful not to give excessive dietary protein
• More than 1.5 –2.0 g/kg per day could be a risk factor for dehydration—especially true in our elderly patients
• To put this into perspective,
  – 6-oz steak = 42 g protein
  – 1 egg = 7 g protein
  – 1 cup milk = 8 g protein
## Simple Protein Tips

<table>
<thead>
<tr>
<th>Protein Source</th>
<th>Grams</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/3 cup non-fat dry milk powder added to glass of milk, mashed potatoes, etc.</td>
<td>8</td>
</tr>
<tr>
<td>1 oz cheese</td>
<td>7-8</td>
</tr>
<tr>
<td>1 egg</td>
<td>8</td>
</tr>
<tr>
<td>2 tbsp peanut butter</td>
<td>7</td>
</tr>
<tr>
<td>¼ cup cottage cheese</td>
<td>7</td>
</tr>
<tr>
<td>¼ ricotta cheese</td>
<td>7</td>
</tr>
<tr>
<td>1 cup greek yogurt</td>
<td>8-23</td>
</tr>
<tr>
<td>OTC protein supplements</td>
<td>7-16/2tbs</td>
</tr>
</tbody>
</table>
Supplementing with Micronutrients?

“If vitamin and mineral deficiencies are confirmed or suspected, it is recommended to provide a multivitamin/mineral supplement that contains the RDI for micronutrients with a role in wound healing. In the absence of confirmed or suspected vitamin and mineral deficiencies, data do not exist to indicate that supplementation will decrease pressure ulcer risk or aid in pressure ulcer wound healing (Reddy 2008).” – ADA Nutrition Care Manual

• Encourage whole, fresh foods offer all of the required nutrients for wound healing, along with added benefits of phytonutrients & antioxidants
• If patients are unable to consume adequate calories, a ready-to-drink high-calorie/high-protein oral nutritional supplement can fill nutritional gaps
• Consider a daily multi-vitamin for patients who live with comorbid diabetes and chronic or non-healing wounds
• Additional supplementation of vitamin A, vitamin C, or zinc is typically only warranted in the presence of a known deficiency, given dangers of over-supplementation
Calories to support TEE

- Promotes anabolism, nitrogen & collagen synthesis, and healing
- Adequate calories = essential for wound healing
  - 30 –35 kcal/kg body weight daily
    Agency for Health Care Policy and Research and the European Pressure Ulcer Advisory Board, American Society for Parenteral & Enteral Nutrition, Wound Healing Society
  - 35 –40 kcal/kg body weight daily for patients who are underweight or losing weight
    National Pressure Ulcer Advisory Panel (NPUAP)

“Although numerous studies have attempted to identify the optimal mix of macronutrients for meal plans of people with diabetes, a recent systematic review confirms that there is no most effective mix that applies broadly, and that macronutrient proportions should be individualized.”
- ADA, Standards of Medical Care in Diabetes, 2013
Devising an Action Plan

Diabetes and wounds are a dangerous combo...

- A lack of glucose control combined with a poor diet can lead to non-healing wounds and eventual amputation
- With appropriate nutritional interventions, it is possible to have wounds heal properly while helping to prevent future wounds
- As RDs, we work with patients to teach them how to
  - self-monitor & record dietary patterns to ensure their increased protein and energy needs are met
  - put together well-balanced meals and regularly monitor their blood sugar levels
  - do frequent meals and “smart snacking,” so that their blood glucose levels are controlled to promote normal wound healing
  - identify malnutrition early and implement appropriate strategies for correcting any nutritional deficits
  - make appropriate lifestyle modifications safely if they would benefit from weight loss
## Sample meal plan for wound healing

<table>
<thead>
<tr>
<th>Time</th>
<th>Meal</th>
<th>Protein</th>
<th>Carbs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Breakfast</strong></td>
<td>1 egg, 1 oz ham, 1 slice wheat toast, 1 orange, 1 cup coffee</td>
<td>7 g</td>
<td>1 carb</td>
</tr>
<tr>
<td><strong>Mid-morning Snack</strong></td>
<td>1 cup yogurt</td>
<td>6 g</td>
<td>1 carb</td>
</tr>
<tr>
<td><strong>Lunch</strong></td>
<td>3 oz beef patty (hamburger), 2 slices whole wheat bread, celery &amp; carrot sticks, 1 apple, Crystal Light beverage</td>
<td>21 g</td>
<td>2 carbs</td>
</tr>
<tr>
<td><strong>Mid-afternoon Snack</strong></td>
<td>1 oz mozzarella cheese, 6 crackers</td>
<td>7 g</td>
<td>1 carb</td>
</tr>
<tr>
<td><strong>Dinner</strong></td>
<td>3 oz chicken, 2/3 cup wild rice, steamed broccoli, green salad with some dressing, 1 roll</td>
<td>21 g</td>
<td>1 carb</td>
</tr>
<tr>
<td></td>
<td>8 oz glass of milk</td>
<td>8 g</td>
<td>1 carb</td>
</tr>
<tr>
<td><strong>Bedtime Snack</strong></td>
<td>2 tbs peanut butter, 6 crackers</td>
<td>2 g</td>
<td>1 carb</td>
</tr>
</tbody>
</table>

### Notes
- **High protein throughout day**
- **High Biological Value (HBVs)**
- **2-3 carb choices at each meal & distributed evenly throughout day**
A practical roadmap: nutrition in chronic wound management

Nutritional support to promote wound healing

Assessment:
- Nutritional assessment with validated screening tool e.g. Malnutrition Screening Tool, Mini Nutritional Assessment (www.mna-elderly.com)
- Regular weighing – Aim for weight maintenance during wound healing (i.e. if underweight increase to normal, if overweight maintain current weight)
- Skin assessment
- Baseline healing score e.g. measured using the PUSH tool (Pressure Ulcer Scale for Healing – www.npuaap.org/PDF/push3.pdf)
- Energy expenditure, e.g. activity level
- Co-morbidities e.g. diabetes
- Documentation of food and fluid intake

Intervention:
- Improve intake of food and fluids
- Improve nutritional quality of the food
- Remove barriers to food consumption
- Supplementation where requirements cannot be met by diet alone

Evaluation:
- Regular ongoing assessment and evaluation of nutritional intake
- Measure success by improvements in measures (e.g. weight, skin condition, PUSH score) compared to initial assessments
- Success can also be indicated by subjective assessment of wound healing and lack of development of new wounds
- Biochemistry

Malnutrition screening tool:

1. Has the resident lost weight recently without trying?
   - No
   - Yes, how much (kg)?
     - 1-5
     - 6-10
     - 11-15
     - >15
     - Unsure
   - Total score

2. Has the resident been eating poorly (for example less than ¾ of usual intake) because of a decreased appetite?
   - No
   - Yes
   - Total score

If the total score is 2 or more the individual is likely to be underweight and/or at risk of malnutrition and should be assessed by a dietician.

Nutrients to promote wound healing

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Recommended intake</th>
<th>Rich sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>30-35 kcal/kg</td>
<td>Carbohydrate &amp; fats such as dairy &amp; cereal products</td>
</tr>
<tr>
<td>Protein</td>
<td>1.5-3g/kg/day</td>
<td>Red &amp; white meats, fish, eggs, liver, dairy products (milk, cheese, yogurt)</td>
</tr>
<tr>
<td>L-Arginine</td>
<td>9g/day</td>
<td>Arginine supplements</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>60-200mg/day</td>
<td>Fruits &amp; vegetables, especially oranges, grapefruit, tomatoes &amp; leafy vegetables</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>700-3000IU</td>
<td>Milk, cheese, eggs, fish, dark green vegetables, oranges, red fruits &amp; vegetables</td>
</tr>
<tr>
<td>Zinc</td>
<td>15-55mg/day</td>
<td>Red meat, fish &amp; shellfish, milk products, poultry &amp; eggs</td>
</tr>
<tr>
<td>Iron</td>
<td>8-18mg</td>
<td>Red meat, offal, fish, eggs, wheat bran, dark leafy vegetables, dried fruits, nuts &amp; yeast extracts</td>
</tr>
<tr>
<td>Fluids</td>
<td>30-35mL/kg/day, (min 1500mL or 6-8 cups/day)</td>
<td></td>
</tr>
</tbody>
</table>

Nutrition in wound healing:

Unsuccessful wound management

Poor nutrition

Delayed wound healing

Tips to improve nutritional status:
- Offer assistance and allow sufficient time for meals
- Provide encouragement, without forcing
- Offer variety
- Encourage frequent drinking of fluids
- Provide foods that patients like
- Position upright when eating
- If the individual has dentures ensure that these are well fitted
- Provide assistance with the opening of containers, lids
Top reference pick list

• American Association of Diabetes Educators (AADE), AADE7 Self-Care Behaviors: Measurable behavior change is the desired outcome of diabetes education.
• Trans Tasman Dietetic Wound Care Group, Evidence-based practice guidelines for the dietetic management of adults with pressure injuries, 2011.
• Casey Dympna et al, A longitudinal qualitative study examining the factors impacting on the ability of persons with T1DM to assimilate the Dose Adjustment for Normal Eating (DAFNE) principles into daily living and how these factors change over time, BMC Public Health, 11:672 (2011), 1-13.
• Michelle Martins et al, Assessment guidance of carbohydrate counting method in patients with type 2 diabetes mellitus, Primary Care Diabetes, 2013.
• C. Melia, Nutrition and Wound Healing. Norwood Hospital, Presentation 2009.

Intl Journal of medical informatics
A systematic critique of diabetes on the world wide web for patients and their physicians, 2004
The web, a widely accessed medium for patients to obtain health information, has special relevance for patients with diabetes. This paper critiques the publicly available web sites for diabetes, and it establishes criteria for excellence in these sites. Only 17% of sites met all criteria for reliability. The sites that best met the criteria for quality were the American Diabetes Association (www.diabetes.org) and the Joslin Diabetes Center (www.joslin.org).
Conclusions: Despite the large numbers of publicly available web sites for diabetes, only a few met criteria for quality. Ongoing evaluation of these quality measures are essential to assure that patients get meaningful and relevant information from the web about managing diabetes.

American Journal of Clinical Nutrition,
Web-based resources for medical nutrition education, 2006
Although the Internet can be a valuable resource for patients and practitioners, the vast amount of nutrition information available makes finding scientifically sound, pertinent sites time consuming and frustrating.
THANK YOU

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