Eating High Calorie in a Fast Paced World
The Nutrition/Lung Function Connection
The Chicken or the Egg?
FEV₁ Percent Predicted vs BMI Percentiles
Patients 1994-2003
FEV$_1$ vs BMI, Patients Aged 21 to 40
1994-2003

Male BMI = 23, Female BMI = 22
Nutritional Therapy for Cystic Fibrosis

• Dietary counseling to achieve high calorie high protein diet
  • Optimize enzyme therapy
  • Optimize Fat soluble vitamin therapy
  • Dietary counseling to achieve adequate salt intake
  • Management of CFRD
  • Recommendations for supplements/GT placement when appropriate
Meet Kelsey

- 10 years old
- has cystic fibrosis
- plays soccer
- has lots of friends
- has a 6 year old brother
Kelsey’s schedule

• 6:30 am Wakes up
• 6:30 – 7 am  Respiratory treatment
• 7-7:20 am Breakfast
• 7:20-7:50 am Gets dressed and ready for school
• 7:50 am Leaves for school (starts at 8:15)
• 12:00-12:20 pm Lunch at school
• 3:30 pm Returns from school
• 3:30 – 3:45 pm snack
• 4-5 pm Soccer practice
• 5:30 – 6:30 pm homework
• 6:45 pm Dinner
• 8 pm Respiratory treatment
• 8:30 pm Has a snack and gets ready for bed
• 9:00 pm Goes to bed
Kelsey’s Diet...
Breakfast (7 am):
• 1 piece of toast with margarine (125 calories)
• 1 cup of 2% milk (120 calories)

Morning snack (10 am):
• fruit snack 1 packet (130 calories)

Lunch (12 pm):
• 1 Peanut butter and jelly sandwich (eats ½= 200 calories)
• 1 carton of 1% milk (100 calories)
• Chips 1 small grab bag (160 calories)
• Sliced apple (usually throws it away)

Afternoon snack (3:30 pm):
• Granola bar (90 calories)
• Glass of whole milk (150 calories)

Dinner: 6:45 pm:
• Grilled chicken 4 ounces (220 calories)
• Rice 1 cup (240 calories)
• 1 serving of broccoli with added butter (60 calories)

Snack (8:30 pm):
½ cup of ice cream (140 calories)

Total: 1735 calories
Nutrition Assessment

• Kelsey’s Diet = 1800 calories
• 10 year old girl with CF = 2400-2700 calories
• 20-50% increase
Nutritional Challenges

• Limited time for breakfast, morning snack, and lunch
• High calorie needs with activities
• Preference for low calorie snacks
• Mom worries Kelsey isn’t eating enough fruits and vegetables
• What about Kelsey’s brother’s nutritional needs
Some solutions...

- Quick high calorie meal and snack ideas (Grab ‘n Go)
- Add fats to foods and beverages (Energy Boosters)
- Try high calorie supplements, homemade shakes/smoothies, and granola bars (minimum of 130-200 calories per bar)
- Try and involve child in grocery shopping and meal preparation
- Serve plenty of fruits and vegetables with added fats/spreads etc
Kelsey’s Diet Make-over...
Breakfast:
- toast with margarine (125 calories)
- 2% milk (120 calories)
**Morning snack:**
- fruit snack 1 packet (130 calories)
**Lunch:**
- Peanut butter and jelly sandwich (eats ½ = 200 calories)
- 1% milk (100 calories)
- Chips 1 small grab bag (160 calories)
- Sliced apple (usually throws it away)
**Afternoon snack:**
- Granola bar (90 calories)
- 2% milk (120 calories)
**Dinner:**
- Grilled chicken (220 calories)
- Rice (240 calories)
- Broccoli with added butter (60 calories)
- 2% milk (120 calories)
**Snack:**
- ice cream (140 calories)
**Total: 1825 calories**

Breakfast (7 am):
- Whole grain waffle & butter & syrup (225 calories)
- Whole milk (150 calories)
**Morning snack (10 am):**
- Trail mix (200 calories)
**Lunch (12 pm):**
- Peanut butter and banana sandwich (eats ½ = 200 calories)
- Carnation Instant Breakfast ©/whole milk (280 calories)
- Chips 1 small grab bag (160 calories)
- Sliced apple (usually throws it away)
**Afternoon snack (3:30 pm):**
- Zbar© (130 calories)
- Whole milk (150 calories)
**Dinner: 6:45 pm:**
- Herb Grilled salmon (510 calories)
- Rice  mixed with 2 tsp oil (300 calories)
- Broccoli with added butter (60 calories)
- Whole milk (150 calories)
**Snack (8:30 pm):**
- ½ cup Ben & Jerry's © ice cream, blueberries (250 calories)
**Total: 2765 calories**
Meet Andrew...

- 15 year old
- has cystic fibrosis
- Likes to skate board with his friends
Andrew’s Schedule

- **7:30 am** Wakes up
- **7:40-8:00 am** Respiratory treatment
- **8:00-8:15 am** Gets dressed
- **8:15 am** Leaves for school
- **12:00 pm** Lunch at school
- **3:30-5:30 pm** Has a snack and hangs out with friends
- **5:30-6:30 pm** Homework
- **6:30-7:00 pm** Dinner
- **7:00-9:00 pm** Finishes homework
- **9-9:30 pm** Respiratory treatment
- **9:30-11:30 pm** Watches TV/social media etc
Andrew’s Diet...
Morning Snack:
Bag of potato chips (160 calories)
Lunch:
Sub Sandwich (500 calories)
Bag of Chips (160 calories)
Carton 1% milk (100 calories)
Snack:
Hamburger (300 calories)
Large French fries (500 calories)
Coke (150 calories)
Dinner:
Spaghetti with red sauce (300 calories)
French bread with butter (105 calories)
Salad with Italian dressing (100 calories)
2% Milk (120 calories)
Snack: 2% milk (120 calories)/2 chocolate chip cookies (200 calories)
Total: 2815 calories
Nutrition Assessment

• Andrew’s Diet = 2800 calories
• 15 year old boy with CF = 3100-3600 calories
Nutritional Challenges

• Skips breakfast
• Doesn’t want to take enzymes in front of friends
Some Solutions.....

• Limit screen time before bed to encourage an earlier bed time (for example no screens after 10 pm)
• Encourage Andrew to share his need to take enzymes with trusted friends
• Offer solutions for taking enzymes in private
Morning Snack:  
Bag of potato chips (160 calories)  

Lunch:  
Sub Sandwich (500 calories)  
Bag of Chips (160 calories)  
Carton 1% milk (100 calories)  

Snack:  
Hamburger (300 calories)  
Large French fries (500 calories)  
Coke (150 calories)  

Dinner:  
Spaghetti with red sauce (300 calories)  
French bread with butter (105 calories)  
Salad with Italian dressing (100 calories)  
2% Milk (120 calories)  
Snack: 2% milk (120 calories)/2 chocolate chip cookies (200 calories)  

Total: 2815 calories

Breakfast:  
Carnation Breakfast w/ whole milk (280 calories)  

Morning Snack:  
Bag of potato chips (160 calories)  

Lunch:  
Sub Sandwich (500 calories)  
Bag of Chips (160 calories)  
Carton 1% milk (100 calories)  

Snack:  
Hamburger (300 calories)  
Large French fries (500 calories)  
Coke (150 calories)  

Dinner:  
Spaghetti with meat sauce (550 calories)  
French bread with butter (105 calories)  
Salad with Italian dressing (100 calories)  
Whole Milk (150 calories)  
Snack: Whole milk (150 calories)/2 chocolate chip cookies (200 calories)  

Total: 3405 calories
Meet Dawn...

• 30 years old with CF
• Works full time
• Travels long distances by car for work
• Not a morning person
Dawn’s Schedule

• 6:30 am: alarm goes off
• 7:15 am: gets out of bed
• 8:00 am: grabs a piece of toast and coffee (120 calories) and leaves for work
• Travels throughout the day to various offices/leaves lunch and enzymes in car to eat on the road
• 5:30-6 pm: stops by the gym on the way home from work
• 7:30 pm: has dinner
• 11 pm: goes to bed
Dawn’s Diet....
Breakfast:
- Piece of toast with butter (100 calories)
- Caffe Latte with whole milk (136 calories)

Lunch:
- Turkey sandwich with cheese and mayonnaise (400 calories)
- Chips (160 calories)
- Banana (120 calories)
- Soda (150 calories)

Dinner:
- Pork tenderloin (200 calories)
- Rice (240 calories)
- Salad with vinagrette dressing (100 calories)
- Piece of garlic bread (200 calories)
- Glass of wine (120 calories)

Total: 1926 calories
Nutrition Assessment

• Dawn’s Diet = 1900 calories
• 30 year old woman with CF = 2400-2500 calories
Nutritional Challenges

- Has difficulty incorporating high calorie option and finding enough time for meals during her busy day
- Dawn’s diet is lacking in calcium
- Proper enzyme storage may be an issue on the go
Some Solutions...

- Finding high calorie on the go options (Grab and Go Handout)
- Opt for higher calorie sources during the day (yogurt, milk, fortified sources)
- Bring enzymes into the offices she visits (store in her purse or brief case)
Breakfast:
- Large whole grain blueberry muffin w/butter (425 calories)

Lunch:
- Turkey sandwich with cheese and mayonnaise (600 calories)
- Chips (160 calories)
- Banana (120 calories)
- Almonds (200 calories)

Dinner:
- Pork tenderloin (200 calories)
- Rice (240 calories)
- Salad w/vinaigrette dressing (100 calories)

Snack:
- cliff bar (250 calories)
- Banana (120 calories)
- Whole milk (150 calories)
- Almonds (200 calories)

Total: 2741 calories

Breakfast:
- Large whole grain blueberry muffin w/butter (425 calories)

Lunch:
- Caffe Latte with whole milk (136 calories)
- Caffe Latte with whole milk (136 calories)

Dinner:
- Pork tenderloin (200 calories)
- Rice (240 calories)
- Salad w/vinaigrette dressing, add cranberries, nuts (200 calories)

Snack:
- cliff bar (250 calories)
- Banana (120 calories)
- Whole milk (150 calories)
- Almonds (200 calories)

Total: 1926 calories
Summary

• Nutrition and an adequate body mass index (BMI) is related to improved outcomes in CF

• People with CF need to consume a high calorie diet to help individuals achieve optimal BMI status

• People with CF are managing busy lives and need smart strategies to help achieve the optimal diet
And remember to do what mom and your dietitian says and...
Eat your veggies..... but with lots of butter!