Optimizing the Implementation of Pediatric Obesity Prevention Guidelines in a Large, Integrated Health System

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Problem: How long does it take to translate research into clinical practice?

17 YEARS\(^1-5\)

Remembering 1999…

- Bill Clinton President of the United States
- Wayne Gretzky plays his last game in the NHL
- Cher’s *Believe* Billboard hit was overtaken by TLC’s *No Scrubs*
- Best Selling Fiction was *The Testament* by John Grisham
- Society for Behavioral Medicine Annual Meeting Theme, *The Next Frontier: Integrating Evidence-Based B.M. Approaches into Health Care.*
In 1999, the Next Frontier Included Integrated Health Communications

As we close out the century, the promise of good health for all Americans seems both tantalizingly close and frustratingly far away. We have made great strides in preventing disease and extending life. However, the science base, which makes progress possible, has not been effectively shared among all who need to understand and act on it. We can do a better job of translating this knowledge into useful communication for all people, and extending it to underserved populations who often carry the heaviest health burdens. New and emerging communication tools may help bring life-enhancing knowledge to people in ways they can use, when and where they need it.

- David Satcher, MD, PhD, Preface, Science Panel on Interactive Communication and Health. Wired for Health and Well-Being: the Emergence of Interactive Health Communication 1999
Patient Lens in Today’s Automated Electronic Health Record (EHR) Environment
Obesity Prevalence among 2-12 year olds, Geisinger Health System, 2014-2015

- **Non-MA OB**:
  - 2Y: 10%
  - 3Y: 14%
  - 4Y: 14%
  - 5Y: 16%
  - 6Y: 18%
  - 7Y: 18%
  - 8Y: 17%
  - 9Y: 24%
  - 10Y: 23%
  - 11Y: 24%
  - 12Y: 29%

- **MA OB**:
  - 2Y: 10%
  - 3Y: 13%
  - 4Y: 18%
  - 5Y: 14%
  - 6Y: 20%
  - 7Y: 21%
  - 8Y: 24%
  - 9Y: 25%
  - 10Y: 24%
  - 11Y: 30%
  - 12Y: 31%

- **NHANES 2011-12**
  - Overall: 17.7%
  - 2-5 years: 8.4%

Proportion BMI ≥95th
Objectives

• Describe clinical implementation of pediatric obesity prevention guidelines using health information technology (HIT) strategies
• Discuss utility of incorporating patient-reported data for clinical decision making and preventive counseling on weight outcomes
• Highlight key implementation lessons
Guidelines, data, and health information technology strategies

Guideline: Identification of BMI Percentile
- Data: Documented 94.6% of Well Child Visits
- HIT: Dual screens in exam room to enable provider-patient/parent discussion of growth

Guideline: Assessment of Medical, Behavioral Risk and Attitude
- Data: Patient-Reported Data for Behavioral Risk - Early Healthy Lifestyles and Family Nutrition and Physical Activity
- HIT: patient-portal, real-time patient feedback, topic preference, integration into EHR for clinical decision support

Guideline: Preventive Counseling
- HIT: Ed. materials accessible at home and 1-click in clinic
Patient-Reported Screening Data: Early Healthy Lifestyles (0-24 mo)

1) What is your relationship to the pediatric patient?
   A. I live with this child and care for him/her regularly (Move to Question 2)
   B. I do not live with this child, but care for him/her regularly (Move to Question 2)
   C. I do not live with this child and I do not care for him/her regularly (End Questionnaire)

2) In the past 7 days, how often was your child fed each food listed below? Include feedings by everyone who feeds the child and include snacks and night-time feedings.

<table>
<thead>
<tr>
<th>Food</th>
<th>Daily</th>
<th>Sometimes</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast Milk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formula</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cow's Milk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100% fruit juice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sweet foods: candy, cookies, cake, ice cream, pudding, etc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sweet drinks: juice drinks, soft drinks, soda, sweet tea, etc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fruits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetables</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3) How much sleep does your child get in 24 hours (includes naps and night sleep)?
   A. 6-8 hours
   B. 9-10 hours
   C. 11-12 hours
   D. More than 12 hours

4) How often does your child have tummy time, floor time, or physically active play each day?
   A. None
   B. Once per day
   C. 2-3 times per day
   D. 4-5 times per day
   E. More than 6 times per day

5) How many hours does your child sit or lay still watching TV, a DVD, video, or playing stationary electronic games each day?
   A. None
   B. Less than 1 hour per day
   C. 1 to 2 hours per day
   D. 2 to 4 hours per day
   E. More than 4 hours per day

6) Is there a TV in your child’s bedroom?
   A. Yes
   B. No

7) How would you describe your child’s current weight status?
   A. Very underweight
   B. A little underweight
   C. About the right weight
   D. A little overweight
   E. Very overweight

8) Do you think your child’s weight presents a current or future health problem? (Ask once)
   A. Yes
   B. No
   C. Not sure

9) We couldn’t afford to eat balanced meals (Ask once)
   a. Often True
   b. Sometimes True
   c. Never True

10) Feeding is a good way to soothe my child when she/he is distressed (sad, hurt, crying). (Ask once)
    A. Disagree
    B. Slightly disagree
    C. Neutral
    D. Slightly agree
    E. Agree
Patient-Reported Screening Data: Family Nutrition and Physical Activity (FNPA)® (2-9 year olds)

<table>
<thead>
<tr>
<th>FOR EACH QUESTION, PLEASE SELECT THE ANSWER THAT BEST REPRESENTS YOUR CHILD/FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My child eats breakfast...</td>
</tr>
<tr>
<td>2. Our family eats meals together...</td>
</tr>
<tr>
<td>3. Our family eats while watching TV...</td>
</tr>
<tr>
<td>4. Our family eats fast food...</td>
</tr>
<tr>
<td>5. Our family uses microwave or ready to eat foods...</td>
</tr>
<tr>
<td>6. My child eats fruits and vegetables at meals or snacks...</td>
</tr>
<tr>
<td>7. My child drinks soda pop or sugar drinks...</td>
</tr>
<tr>
<td>8. My child drinks low fat milk at meals or snacks...</td>
</tr>
<tr>
<td>9. Our family limits eating of chips, cookies, and candy...</td>
</tr>
<tr>
<td>10. Our family uses candy as a reward for good behavior...</td>
</tr>
<tr>
<td>11. My child spends less than 2 hours on TV/games/computer per day...</td>
</tr>
<tr>
<td>12. Our family limits the amount of TV our child watches...</td>
</tr>
<tr>
<td>13. Our family allows our child to watch TV in their bedroom...</td>
</tr>
<tr>
<td>14. Our family provides opportunities for physical activity</td>
</tr>
<tr>
<td>15. Our family encourages our child to be active every day</td>
</tr>
<tr>
<td>16. Our family finds ways to be physically active together...</td>
</tr>
<tr>
<td>17. My child does physical activity during his/her free time...</td>
</tr>
<tr>
<td>18. My child is enrolled in sports or activities with a coach or leader...</td>
</tr>
<tr>
<td>19. Our family has a daily routine for our child’s bedtime...</td>
</tr>
<tr>
<td>20. My child gets 9 hours of sleep a night...</td>
</tr>
</tbody>
</table>

**Parent:** Immediate feedback. Discuss with physician today?

**NO**

**YES:** Which 3 topics?

Physician Clinical Decision Support: EHR alert FNPA results, topic preference, talking points, 1-click to educational materials

Parent educational materials

Geisinger
2. Family Eating

Our family rarely eats fast food but we eat while watching TV.

**Recommended Practice**

Regular consumption of food away from home, particularly at fast food establishments, has been associated with increased risk for overweight, especially among adolescents. It is harder to make healthier choices when eating out so reducing meals out can promote healthier eating. It is also important to not watch television while eating meals as this may cause children to eat too much or to eat less healthy foods.
Cook Healthy

Get the Kids Involved!

Want your kids to eat healthier? Make it easier (and more fun!) to prepare fresh meals at home and eat fast food less often by involving your kids in the kitchen. Although popping a meal in the microwave might seem like the easiest option, it is not always the best one. Pre-prepared, microwaveable, or heat and serve entrees are often higher in sodium, fat and calories than freshly prepared meals. These tips will make you and your kids kitchen pros.

Allow your children to pick a recipe
Make a list of the ingredients, and check off the ones you already have. Shop together for the rest.

Make the rules clear
If you do not want your kids to touch the stove or knives, tell them so. When they are old enough, allow them to use the stove and sharp objects with your close supervision.

Expect mistakes
The experience of cooking together is more important than the finished recipe. Just ignore little spills or the pepper that misses the bowl.

Give your kids appropriate tasks for their age and level of development
The following may be appropriate for the youngest children:
- Tear lettuce
- Rinse fruits, vegetables and canned beans that have been placed in a colander
- Add ingredients to a bowl
- Stir ingredients
- Beat eggs

Kids have short attention spans
Keep them busy with vegetables to wash or pots to stir. Even setting the table and putting things in the trash count.

Cooking for Picky Eaters
If your kids are picky when it comes to eating fruits and vegetables, try these tips:
- Involve your kids in selecting and preparing fruits and vegetables.
- Serve the fruits and vegetables you know your kids like at meals and snacks.
- Keep offering your kids fruits and vegetables they don’t like. It often takes kids several exposures to a new food before they will accept it.
- If your kids like fresh broccoli but not steamed broccoli, it’s okay!

Easier-than-Ever Entrees
Next time you think grabbing a frozen dinner or other prepared entrée would be easier than making dinner yourself, think again. Try these super-easy entrees that will cost you less time, calories and fat, and money!
- Black bean tacos (black beans, tortillas, salsa)
- Chicken salad (rottiserie chicken, shredded, over romaine lettuce)
- Veggie stir fry (frozen veggie mix and a touch of low-sodium soy sauce)
- Pork tenderloin (throw in the crockpot and let it cook on low all day)
- Cheesy quesadillas (whole wheat tortilla with reduced-fat cheese and salsa)

Limit Soft Drinks
There are many ways to kick the soft drink habit.
- Be a good example and drink fewer soft drinks or sugary drinks and your kids will follow.
- Drink more water.
- For a sweet treat that still offers a great dose of nutrition, offer your kids low-fat chocolate milk, fruit smoothies (made with low-fat milk or yogurt) or 100% fruit juice.

Peanut Butter Wrap
Place a tortilla or whole wheat wrap on a plate. Spread with peanut butter. Sprinkle with shredded carrots or a favorite fruit such as raisins, sliced bananas or strawberries. Tightly roll the tortilla or wrap and cut into bite-sized pieces.

Authored by Academy of Nutrition and Dietetics staff registered dietitians.
For more articles, tips, recipes and videos to help your kids eat healthy, visit www.kidseatright.org.
To find a registered dietitian in your area, visit www.eatright.org.

Kid Eat Right is a joint effort of the Academy of Nutrition and Dietetics and the Academy of Nutrition and Dietetics Foundation to end childhood obesity and provide the resources to help families, communities, and policy makers ensure quality nutrition for children.

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FNPA Pilot: Randomized Cluster Controlled Design

**Usual Care (UC)**

- **Well Child Visit Y1**
  - 14 clinics
  - 2-5 Year Olds (n = 1339)
  - 6-9 Year Olds (n = 660)

**UC + PS_{after}**

- **Well Child Visit Y1**
  - 9 clinics
  - 2-5 Year Olds (n = 488)
  - 6-9 Year Olds (n = 122)

- **Parent Screening After WCV**
  - FNPA Data Capture
  - Phone Interview
  - 2-3 weeks post WCV

**PS_{before} + CDS**

- **Parent Screening Before Well Child Visit Y1**
  - 7 clinics
  - 2-5 Year Olds (n = 1183)
  - 6-9 Year Olds (n = 563)

- **FNPA Data Capture**
  - Pre-Appointment: MyGeisinger
  - During Appointment: Waiting or Exam Room

- **Well Child Visit with CDS**
  - Growth Charts
  - FNPA Results
  - Parent Topics
  - Provider Talking Points

**Well Child Visit Y2**
# Participant Demographics

## Baseline Characteristics 2-5 Years

<table>
<thead>
<tr>
<th></th>
<th>PS\textsubscript{before} (N=1183)</th>
<th>PS\textsubscript{after} (N=488)</th>
<th>Control (N=1339)</th>
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<tbody>
<tr>
<td><strong>Females</strong></td>
<td>558 (47.2%)</td>
<td>245 (50.2%)</td>
<td>644 (48.1%)</td>
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<tr>
<td><strong>Race/Ethnicity</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>1091 (92.2%)</td>
<td>449 (92.0%)</td>
<td>1261 (94.2%)</td>
</tr>
<tr>
<td>Black</td>
<td>61 (5.2%)</td>
<td>25 (5.1%)</td>
<td>37 (2.8%)</td>
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<tr>
<td>Asian</td>
<td>14 (1.2%)</td>
<td>8 (1.6%)</td>
<td>26 (1.9%)</td>
</tr>
<tr>
<td>Multi</td>
<td>9 (0.8%)</td>
<td>1 (0.2%)</td>
<td>6 (0.5%)</td>
</tr>
<tr>
<td>Other</td>
<td>6 (0.5%)</td>
<td>5 (1.0%)</td>
<td>7 (0.5%)</td>
</tr>
<tr>
<td>Missing</td>
<td>2 (0.2%)</td>
<td>0 (0.0)</td>
<td>2 (0.1%)</td>
</tr>
<tr>
<td><strong>Weight Category</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underweight</td>
<td>38 (3.2%)</td>
<td>18 (3.7%)</td>
<td>67 (5.0%)</td>
</tr>
<tr>
<td>Normal</td>
<td>807 (68.2%)</td>
<td>331 (67.8%)</td>
<td>980 (73.2%)</td>
</tr>
<tr>
<td>Overweight</td>
<td>184 (15.6%)</td>
<td>48 (9.8%)</td>
<td>169 (12.6%)</td>
</tr>
<tr>
<td>Obese</td>
<td>143 (12.1%)</td>
<td>48 (9.8%)</td>
<td>123 (9.2%)</td>
</tr>
<tr>
<td>Unavailable</td>
<td>11 (0.9%)</td>
<td>43 (8.8%)</td>
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</table>

## Baseline Characteristics 6-9 Years

<table>
<thead>
<tr>
<th></th>
<th>PS\textsubscript{before} (N=563)</th>
<th>PS\textsubscript{after} (N=122)</th>
<th>Control (N=660)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Females</strong></td>
<td>276 (49.0%)</td>
<td>56 (45.9%)</td>
<td>318 (48.2%)</td>
</tr>
<tr>
<td><strong>Race/Ethnicity</strong></td>
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<td></td>
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</tr>
<tr>
<td>White</td>
<td>525 (93.3%)</td>
<td>103 (84.4%)</td>
<td>618 (93.6%)</td>
</tr>
<tr>
<td>Black</td>
<td>25 (4.4%)</td>
<td>10 (8.2%)</td>
<td>15 (2.3%)</td>
</tr>
<tr>
<td>Asian</td>
<td>4 (0.7%)</td>
<td>3 (2.5%)</td>
<td>15 (2.3%)</td>
</tr>
<tr>
<td>Multi</td>
<td>1 (0.2%)</td>
<td>1 (0.8%)</td>
<td>3 (0.5%)</td>
</tr>
<tr>
<td>Other</td>
<td>6 (1.1%)</td>
<td>2 (1.6%)</td>
<td>9 (1.4%)</td>
</tr>
<tr>
<td>Missing</td>
<td>2 (0.4%)</td>
<td>3 (2.5%)</td>
<td>0</td>
</tr>
<tr>
<td><strong>Weight Category</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underweight</td>
<td>18 (3%)</td>
<td>3 (2.5%)</td>
<td>17 (2.6%)</td>
</tr>
<tr>
<td>Normal</td>
<td>378 (67%)</td>
<td>76 (62.3%)</td>
<td>436 (66.1%)</td>
</tr>
<tr>
<td>Overweight</td>
<td>77 (13.7%)</td>
<td>16 (13.1%)</td>
<td>103 (15.6%)</td>
</tr>
<tr>
<td>Obese</td>
<td>89 (15.8%)</td>
<td>16 (13.1%)</td>
<td>104 (15.8%)</td>
</tr>
<tr>
<td>Unavailable</td>
<td>1 (0.2%)</td>
<td>11 (9%)</td>
<td>0</td>
</tr>
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</table>
Hypothesis and Primary Outcome Measure

- **Hypothesis:** Children in $\text{PS}_{\text{before}} + \text{CDS}$ arm will show smaller increases in BMI than usual care.

- **Primary outcome:** Change in BMI50 over one year.

- BMI50 is the deviation from the 50th percentile for age and gender (CDC growth charts).
  - More appropriate for prevention outcome than looking at *reductions in* BMI because children have normal BMI distribution at baseline.
  - BMI %-tile curves flatten at higher weight status$^{10,11}$
BMI50 for 7 yr. old boy, 4’ tall

- **45 lbs**: BMI% 4%, BMI50 -12
- **60 lbs**: BMI% 91%, BMI50 18
- **75 lbs**: BMI% >99%, BMI50 47
- **90 lbs**: BMI% >99%, BMI50 77
BMI50 Outcomes: 2-5 year olds

Counter to hypothesis, no difference between PS\textsubscript{before} & usual care (UC).

Compared to UC control group, those who received UC + PS\textsubscript{after} had greater BMI50 reductions 0.965 (p = 0.13) at one year. Not necessarily a desirable finding.
BMI50 Outcomes: 6-9 year olds

- Confirmed hypothesis: Compared to UC control group, those who received $P_s_{before} + CDS$ had greater BMI50 changes 0.93 (p=0.07) at one year.
- No significant differences between UC and UC + $P_s_{after}$ groups at one year.
- Most pronounced gains in kids with baseline BMIs <50th percentile, kids at 50th-89th percentile very close to 0, and kids >90th percentile had negative BMI50 changes.
Pilot Study Conclusions and Next Steps

Conclusions

- Age variation in results
  - Are we asking the right screening questions for parents of 2-5 year olds?

- HIT-enabled intervention with CDS seems to have utility in promoting healthy weight trajectories for 6-9 year olds
  - Will there be compounding benefits overtime?
  - Could a simpler post-care intervention be effective for parents of 2-5 yr olds?

Next Steps

- 2-5 year old tool refinement
  - Exploratory factor analysis of FNPA and weight trajectories in 2-5 year olds to determine useful items to include
  - Modify tool and evaluate 1 year outcomes in BMI50

- Longitudinal study of behavioral indicators and child growth (≥6 yr olds), interactions with health care and community-level factors

- Treatment for ≥6 year olds
Implementation Evaluation

Consolidated Framework for Implementation Research\(^{12}\)

Characteristics of Intervention
- Guidelines-standard of care; evidence-based tool for 6-9 yr olds, patient-and provider-informed design

Inner setting
- EHR analytics, expansion of visit codes to ensure firing of screenings

Individuals involved
- Parent satisfaction surveys (N= 211)
  - 99.9% agreement that PCPs talked about obesity prevention using sensitive, non-blaming language
  - \( P_{\text{before}} \) parents were more likely to identify sleep being discussed than usual care (\( p<0.05 \))
  - Regardless of child weight, parents’ satisfied with and will continue discussing weight and habits with PCPs

Implementation Process
- iPad least preferred by patients; providers want ease in documentation
- \( P_{\text{before}} \) completion rates 32% (includes 7% patient portal)
# Implementation Lessons and Next Steps

## Lessons

- Parent screening tool low completion rates attributed to:
  - low use of patient portal
  - provider incentive to see patients within 5 minutes of arrival regardless of scheduled time
- Account for local variation in workflow

## Next Steps

- Encourage parent enrollment in patient-portal to access information and save time
- Work with administration to align provider incentives with quality
- Adequately equip clinics with technology tools
- Communicate workflow strategies that save time and improve quality
Final Thoughts

We’ve shown that it is possible to implement guidelines into practice with aid of HIT in less than 10-17 years

• Guidelines based on best available evidence in 2007 and implemented at Geisigner in 2013.
  • Gaps – under 2 (Dr. Williams will discuss next)

• Behavioral assessment- need an evidence-based tool for 2-5 year olds
  • Successfully adapted research on an evidence-based tool into the clinic (super quick- 2009 to 2013)

Imperative to look beyond (before) primary outcome to tell the whole story.

Learning health care systems are continuously innovating, discovering, and maturing.

Health care systems are part of the obesity prevention solution.
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<tr>
<th>References</th>
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