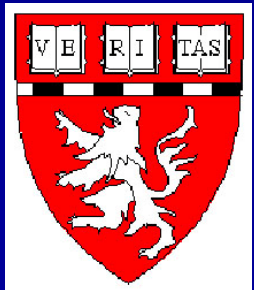# Utilization of Electronic Health Records and Decision Support Tools in Large, Simple Trials

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Goals of this Presentation

- Provide examples of two large simple cluster-randomized controlled trials and the use of electronic health records and decisions support tools in both.

- Lessons learned:
  - Pros and cons
  - Risks and tradeoffs
  - Stakeholder engagement

Main Research Partnership

- Harvard Vanguard Medical Associates
  - Multi-site, multi-specialty group practice
  - 14 locations across eastern MA
  - Cares for members of all insurance plans
  - Electronic medical record system (EPIC™)
    - Actual medical record since 1969; includes height, weight, demographics, lab values, utilization data, appointments …

Overview of Uses of EHR for Research

- Surveillance
  - Obesity trends in defined populations

- Etiology
  - Determinants of and potential targets for obesity

- **Interventions**
  - **Identification of eligible participants, delivery of intervention, assessment of outcomes**

- Health disparities
  - Assessing differential effects of interventions

- Dissemination
  - Sharing of EHR programming code to assist with dissemination of best practices

Interventions

- Completed NICHD-funded R01, primary care-based Ix to prevent obesity among preschool age children.
- 10 pediatric practices of HVMA
- Ix strategies: Restructuring of primary care, Nurse practitioners trained to conduct obesity management visits using motivational interviewing
- Intervention affected obesogenic behaviors
- Effects on BMI at 1 year among girls, but not boys, and among lower income (v. higher income) participants

- Ongoing HHS Office of Planning & Evaluation-funded R18 cluster-RCT to accelerate adoption of childhood obesity comparative effectiveness research evidence among clinicians and parents
- 14 pediatric practices in eastern MA
- Ix strategies: Electronic decision support tools for clinicians; telephone and text message support for parents

Characteristics	High Five for Kids	STAR
Study Design	Cluster-RCT	Cluster-RCT
Age Group	2-6 year olds	6-12 year olds
Setting	10 pediatric offices	14 pediatrics offices
Sample size	500	800
Duration	2 years	1 year

Ix Components
  Health system Δ
  Individual Δ
	Restructuring of care delivery; motivational interviewing by nurse practitioners; tailoring to readiness to change	Point-of-care alerts; decision support tools; text messaging, telephone coaching

Outcomes
  Health system Δ
  Individual Δ
	N/A
	Change in BMI; behavior
		Point-of-care HEDIS
		Change in BMI;behavior

Follow up	95% follow up rate	TBD

Use of EHR for recruitment

- HIPAA Waiver of Authorization for recruitment
  - Access minimum necessary PHI
- Identification of "pre-eligible" participants, e.g. all children 5-12 years with a body mass index ≥ 95th percentile
  - Ability to exclude specific ICD-9 codes (chronic medical conditions)
  - Exclude patients on research 'Do Not Contact' list
- Clinicians sent a list of their pre-eligible patients and asked to exclude any families they do not want us to contact

Use of EHR for recruitment

- Using weekly data pulls of upcoming appointments, we can identify visits for non-excluded patients

- Upcoming scheduled visit triggers research staff to begin recruitment protocol
  - Letter describing study
  - Opt-out toll free number

Use of EHR for intervention delivery

Electronic decision support can be an effective and highly scalable tool for improving uptake of comparative effectiveness research:

- Point-of-care alerts (Best Practice Alerts)

- Decision support tools (Smartsets)

- Electronic patient portals for communication with families/patients

Clinical Point-of-Care Alert

- Intervention practices implement a point-of-care alert for children with a BMI ≥ 95th percentile:

BestPractice Advisory – Eva,Jane U

Based on today's height and weight, this 6 - 12 year old child has a Body Mass Index >= 95th percentile for his/her age and sex.
Body Mass Index (BMI) is 60 kg/(m2).
100th percentile based on BMI-for-age and sex

☐ Open SmartSet: PEDIATRIC WELL CHILD CARE OBESITY SMARTSET   preview
☐ Open SmartSet: PEDIATRIC OBESITY FOLLOW UP VISIT SMARTSET   preview
Jump to US Preventive Services Task Force report from 2010
Jump to Expert Committee Recommendations
Jump to Growth Charts

Accept   Cancel

- The alert leads to a structured template for obesity management based on Expert Committee guidelines.
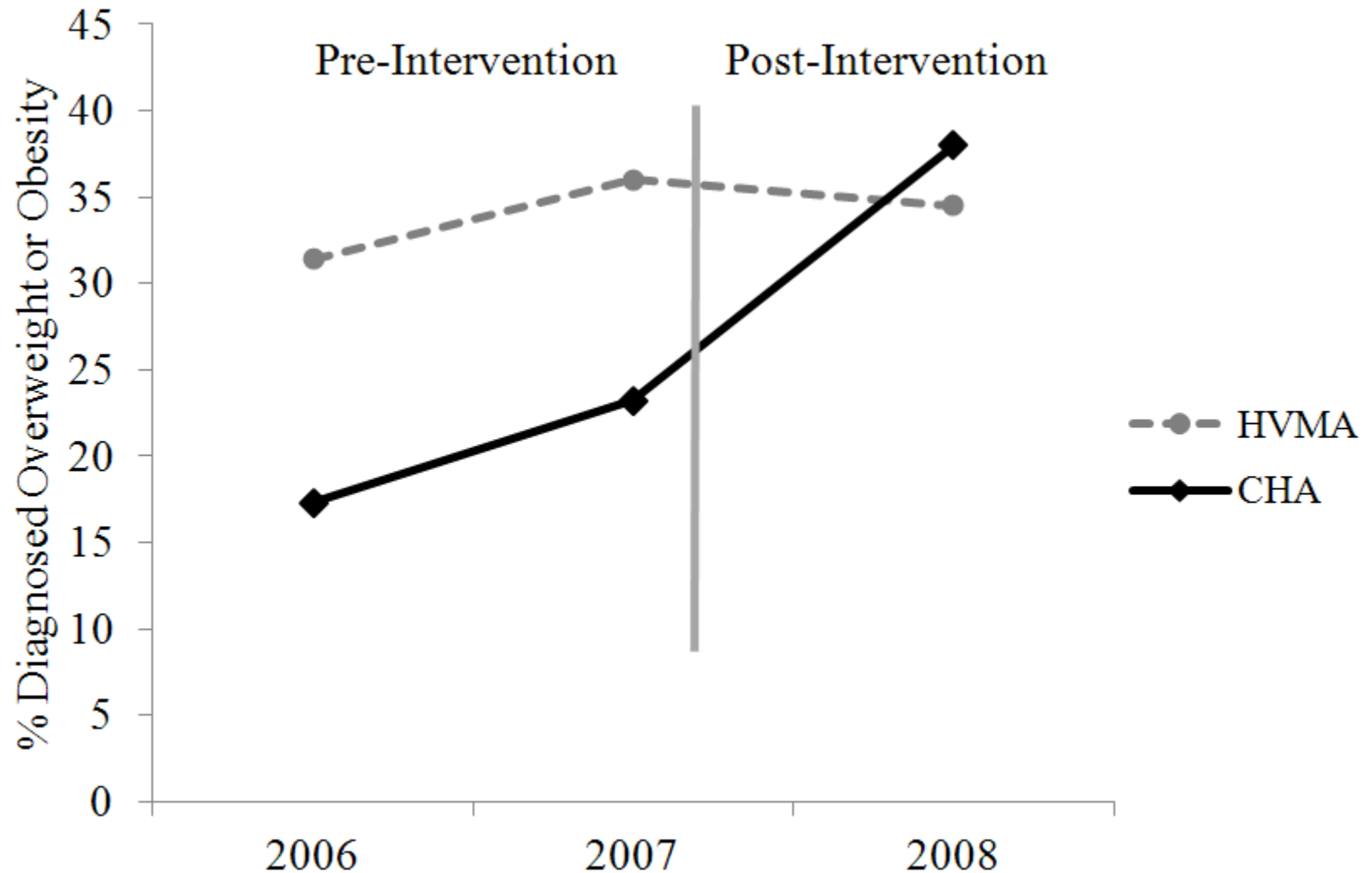
Clinical Decision Support

- The alert leads to a structured template for obesity management based on Expert Committee guidelines.

- Diagnoses
  - Obesity code meets HEDIS requirements

- Lab Orders

- Referrals

- Patient Instructions/After Visit Summary

Evaluation of a Point-of-Care Alert for Obesity Diagnosis

Use of EHR for outcome assessment

- Tie our outcomes to scheduled, annual well child care visits

- HEDIS, point-of-care outcomes are available immediately following the visit
  - ICD-9 diagnosis codes; V codes; Billing; Orders for referral or follow up; Laboratory results

- Clinical measures of body mass index from annual visits (95% follow up rate)

Cons, Risks, and Tradeoffs

1. Privacy – requires a HIPAA Waiver of Authorization to access minimal amount of information from records.

2. Consent - Written consent required to access more detailed EHR outcomes.

3. Programming code for decision support tools are specific to the EHR vendor making dissemination to other vendors difficult.

4. Alert fatigue – competing demands of clinicians to respond to alerts

Cons, Risks, and Tradeoffs

5. Substantial effort required to develop tools, train and support clinicians

6. Accuracy of height and weight measurements
   – In-service training to standardize measurements

7. Careful to not interfere with clinical work flow
   – Clinician surveys are not feasible or well-liked

8. Difficulty using EHR to collect outcomes from non-discrete fields, free text, e.g. smoking, breastfeeding, and other behaviors.
   – Require natural language processing
   – Need for patient surveys

Stakeholder Engagement

- Formative assessments and clinician interviews

- Pilot testing of beta product

- Use of multiple methods for training busy clinicians (webinar, in-person trainings, conference calls, emailed information, YouTube videos)

- Engage clinician champions at each practice site

Physicians' Perspectives on Electronic Decision Support Alerts for Obesity Management

- In-depth interviews with 32 pediatric providers

- Examined barriers and facilitators to use of an existing electronic alert for obesity diagnosis and management

- Using a "test patient" in the electronic health record system, pediatricians gave real-time responses about

  - facilitators and barriers to the use of alerts and SmartSets
  - experience with obesity alerts and the Obesity SmartSet
  - perceptions of effective methods for improving obese patient outcomes.

Dryden, Taveras, Hacker; Clin Peds; 2012.

Clinician Recommendations

- Alert design should incorporate tools to assist physicians in providing behavioral interventions

- Alert and Smart Set should be streamlined
  - E.g.The alert should be very brief, not require clicks to other screens, and should include a specific clinical action to do during the visit.

- Automate tasks and integrate alerts and Smart Sets into physicians' natural work flow
  - E.g. if BMI triggers obesity alerts, should be automatically added to patient problem list; integrated 'obesity well-child' Smart Set should open if vitals suggest child is obese; add hotlinks to educational materials

- Provide greater visibility, education around SmartSets
  - Multiple methods should be implemented to introduce the staff to a SmartSet and its contents.

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