

# **The Medical Home - What Do We Know, What Do We Need to Know?**

## **A Review of the Current State of the Evidence**

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**Medical Home Webinar**

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**MATHEMATICA**  
**Policy Research**

# Objectives

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- Background on the Patient-Centered Medical Home (PCMH)
- Findings from a systematic review of the early evidence on the PCMH
- Methodological challenges in evaluating the PCMH
- How to improve PCMH evaluations
- Answer questions

# The Patient-Centered Medical Home

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- A model of primary care delivery that is:
  - *Patient-centered*
  - *Comprehensive*
  - *Coordinated*
  - *Accessible*
  - *Continuously improved through a systems-based approach to quality and safety*
  - *Supported by health IT, workforce development, and payment reform*

AHRQ PCMH Definition: <http://www.PCMH.AHRQ.gov>

# Widespread Interest in the PCMH

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- 27 multi-stakeholder pilots in 18 states
- In 2010, over 5 million patients with private insurance and Medicaid enrolled in PCMH demonstrations.
- Many federal agencies testing the PCMH model – CMS, VA, TRICARE, Indian Health Service
- In 2010, 1,506 sites recognized as a medical home by NCQA

## But Does It Work?

- Most previous reviews of evidence for this young model have limitations.
- AHRQ commissioned a systematic review:
  - Peikes D, Zutshi A, Genevro J, Parchman M, Meyers D. “Early Evaluations of the Medical Home: Building on a Promising Start.” *American Journal of Managed Care*, February 2012
  - See <http://www.PCMH.AHRQ.gov> for forthcoming white papers:
    - The Medical Home: What Do We Know, What Do We Need to Know?: A Review of the Earliest Evidence on the Effectiveness of the Patient-Centered Medical Home Model  
Peikes D, Zutshi A, Smith K, et al., forthcoming 2012.
    - Early Evidence on the Patient-Centered Medical Home  
Zutshi A, Peikes D, Smith K, et al., forthcoming 2012.

# Interventions Included in This Review

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- 498 citations screened
- 14 studies of 12 interventions met the two inclusion criteria:
  - Had at least 3 of the 5 core principles of the PCMH:
    1. Patient-centered
    2. Comprehensive
    3. Coordinated
    4. Accessible
    5. Continuously improved through a systems-based approach to quality and safety
  - Quantitatively evaluated a triple aim outcome

# Most Interventions are PCMH Precursors

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- The current conceptualization of the PCMH was not formulated until 2007.
- It takes time to design and evaluate an intervention and disseminate findings.
- In September 2010, only very early results were available.
- Most interventions pre-date the emergence of the model and tested an embedded care manager rather than a transformed practice – “PCMH precursors”

# Interventions Included in the Evidence Synthesis

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- 6 of the 12 interventions were evaluated using rigorous methods for at least one outcome
- We synthesize evidence using only the rigorous evaluations



# PCMH Precursors with Rigorous Evidence

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- Care Management Plus (CMP)
- Geisinger Health System (GHS) ProvenHealth Navigator
- Geriatric Resources for Assessment and Care of Elders (GRACE)
- Guided Care
- Improving Mood—Promoting Access to Collaborative Treatment for Late-Life Depression (IMPACT)
- Veterans Affairs Team-Managed Home-Based Primary Care (VA TM/HBPC)

# We Do Not Synthesize Evidence from Many Often-Cited Interventions

- **Group Health Cooperative**
  - Evaluation of only 1 intervention clinic (larger study under way)
- **Community Care of North Carolina (3 studies)**
  - 1 did not report methods
  - 1 did not report comparability at baseline
  - 1 had dissimilar treatment and comparison groups at baseline
- **AAFP National Demonstration Project (TransforMed)**
  - Evaluated using rigorous methods
  - Intervention did not test effect of PCMH but rather tested effects of facilitated versus self-directed transformation to a PCMH

# Advanced Sneak Peak at the Results

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# Punchline

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- Rigorous evaluations--of PCMH precursors--reveal positive effects on all three triple aim outcomes, a few negative effects on costs, and many inconclusive effects
- The field of PCMH evaluation is very young; this review highlights the need for more and better evaluations

# Limited Rigorous Evidence on PCMH Precursors

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- Quality
  - Processes of care 3 studies
  - Health outcomes 3 studies
- Cost and Utilization
  - Total costs 4 studies
  - Hospitalization 5 studies
  - ED use 3 studies
- Experience of Care
  - Patients 3 studies
  - Caregivers 2 studies
- Health Care Professional Experience 1 study

# What We Know: Quality

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- Processes of Care: 3 studies
  - 1 demonstrated positive effect
  - 2 inconclusive due to limits in statistical analysis
- Health Outcomes: 3 studies
  - 1 strong positive results
  - 1 moderate positive results
  - 1 inconclusive due to limits in statistical analysis

# What We Know: Cost

- Total Cost: 4 studies
  - 1 study with cost savings for high-needs patients in year 3
    - But unfavorable effects for:
      - ◆ Low-risk patients all 3 years
      - ◆ All patients the first 2 years
  - 1 study with total cost increase over 1 year
  - 2 studies inconclusive
    - Had non-statistically significant total cost savings (5-10%)
    - May be due to lack of effect but likely due to lack of statistical power

# What We Know: Utilization

- Hospitalization: 5 studies
  - 3 found reduced use (all or high-needs patients)
  - 1 was inconclusive; lack of accounting for clustering
  - 1 was inconclusive; no statistically significant reductions
  - Diverse populations, interventions, and time frames make it difficult to combine results in a meta-analysis
- ED use: 3 studies
  - 1 had significant reduction in year 2
  - 1 was inconclusive; lack of accounting for clustering
  - 1 was inconclusive; no statistically significant reductions



# What We Know: Experience of Care

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- Patient experience: 3 studies
  - 2 found improvements, 1 was inconclusive
- Caregiver experience: 2 studies
  - 1 found improvements, 1 was inconclusive

Notes: The same study was inconclusive regarding effects on experience in both categories.

These interventions were designed before the current focus on improving patient-centeredness.

# What We Know: Health Care Professional Experience

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- Health care professional experience: 1 study
  - The study was inconclusive

# Recap of What We Know

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- Despite significant and growing interest in the PCMH, the evidence currently available is on PCMH precursors
  - We should not expect to have a strong evidence base at this time
- Rigorous evaluations of PCMH precursors reveal positive effects on all three triple aim outcomes, a few negative effects on costs, and many inconclusive effects
- The field of PCMH evaluation is very young; this review highlights the need for more and better evaluations

# Lessons Learned: How to Improve Future Evidence So We Can Achieve the Triple Aim



## Cause for Concern

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- A 2010 review found that nearly 60 percent of current demonstrations and pilots did not have a detailed evaluation plan (Bitton et al.)
- Of those with planned evaluations:
  - Many were designed and funded well after the demonstration had begun
  - Only 38 percent were collecting data from a comparison group of practices
  - Most use pre-post designs, making it difficult to conclude that results are due to the intervention
  - Many planned evaluations are underpowered

# We Face Challenges Assessing Medical Homes

- Early adopters are not typical—what is counterfactual?
- Correlation of outcomes within practices (“clustering”)
  - The interventions change entire practices
- Limited number of practices in each study
- High variation in costs and health care service use
- Hard to improve some outcomes for low-risk patients, so difficult to detect effects
- These challenges make it hard to determine if the intervention worked (versus random noise)

# And the Need Is Great Because the Current Evidence Is Limited

The literature to date examines effects of the earliest precursors of the medical home—the pioneers.



# Focus Evaluations on Quality, Cost, and Experience

Among 14 studies, limited coverage of the key outcomes.

- 5 of 14 looked at aspects of all 3
- 5 of 14 looked at patient experience (less of a focus then)





# Include Comparison Practices to Make Evaluations Credible

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Study designs are ranked according to the quality of evidence they can produce:

- **Excellent: Randomized controlled studies.** If well-implemented, changes in outcomes can be attributed to the intervention itself.
- **Very good: Matched comparison studies.** Comparison groups that are similar to the treatment group in terms of baseline patient outcomes, as well as practice variables such as the mix of patients, number of providers, and key infrastructure such as electronic health records.
- **Poor: Pre-post evaluation.** Difficult to conclude that changes observed are due to the intervention.

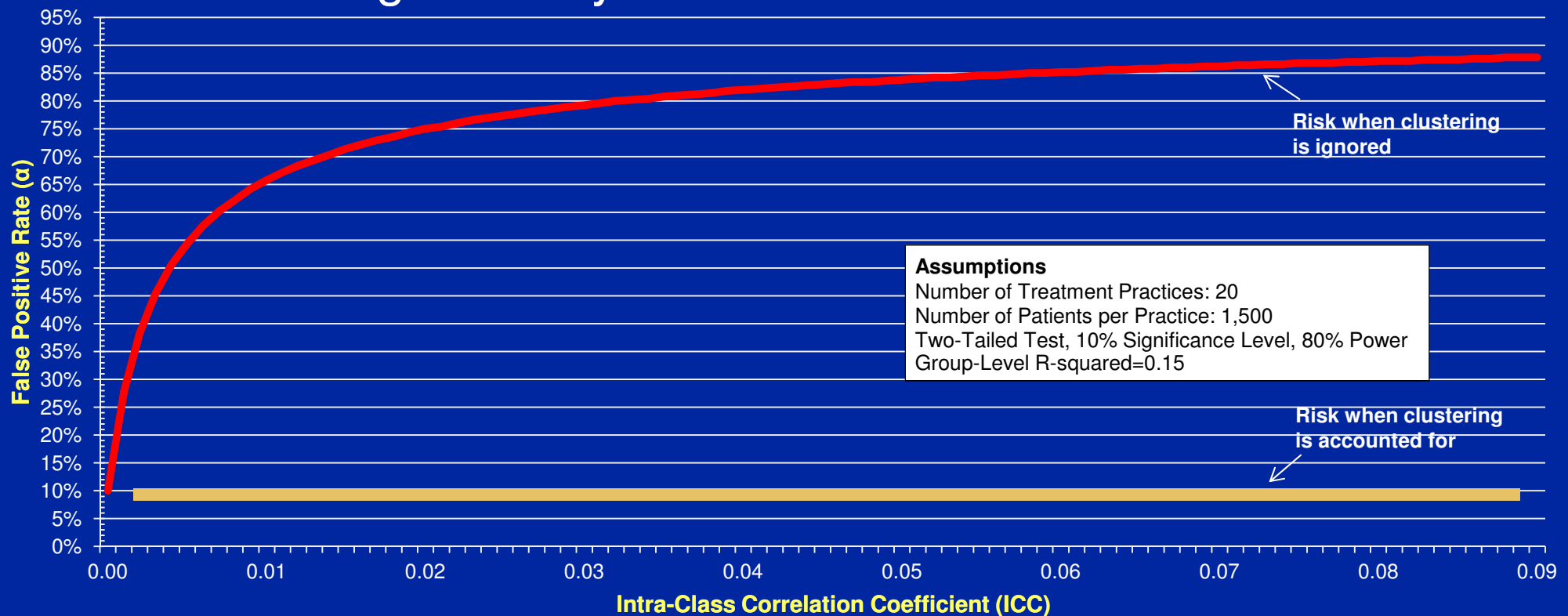
# Recognize That the PCMH Is a Practice-Level Intervention: Adjust for Clustering

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- Commission evaluations that account for clustering at two phases:
  - **Design Phase** - Not doing so will lead to underpowered studies, increasing the chance that we will conclude there was no effect when there was (*false negative*)
  - **Analysis Phase** - Not doing so will increase the chance we believe the intervention worked, when it did not (*false positive*)

# Not Accounting for Clustering in Analysis Leads to False Positives

- False positive rates when ignoring the effects of clustering are likely to exceed 65%



A graph of the false positive rate rising as the intra-cluster correlation coefficient increases, with 20 treatment practices. If there is no clustering, there is a 10 percent chance of a false positive. The false positive rate increases to over 65 percent if the clustering is 0.01, and to over 80 percent as clustering increases.

Peikes D, Dale S, Lundquist D, Genevro J, Meyers D, Building the Evidence Base for the Medical Home: What Sample and Sample Size Do Studies Need? October 2011.

# Include as Many PCMH Practices as Possible

Include **more practices** rather than more patients to be able to detect effects.

Number of Treatment Practices	Minimum Detectable Effect on Cost, All Patients
500	9%
200	14%
100	20%
50	28%
20	45%
10	66%

*Note: These are based on the small number of estimates of clustering and variation in the literature. Ask your evaluators to tailor these to your study context. Assumes an equal number of control practices.*

# Identify the Right Samples of Patients to Answer Each Evaluation Question

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- The medical home alters the way the whole practice operates, but **different outcomes must be assessed using different patient samples.**
- This increases the likelihood of detecting a true effect.

# Use High-Risk Patients to Measure Costs

- Interventions are **very unlikely to generate large enough cost reductions among all patients** for studies to detect them
  - Cost reductions greater than 5% across all patients are not seen in the literature
  - Because there is so much variation in costs, it is hard to distinguish effects of programs from noise
  - Same is true for service use
- It is **easier to detect effects on cost among high-risk patients**
  - There are better opportunities to reduce costs for chronically ill patients
  - There is less variation in costs in this subsample

# Fewer Practices Are Needed to Detect Effects on Cost in Chronically Ill Patients

Number of Treatment Practices	Minimum Detectable Effect	
	All Patients	Chronically Ill Patients
500	9%	4%
200	14%	6%
100	20%	9%
50	28%	13%
20	45%	20%
10	66%	30%

*Note: These are based on the small number of estimates of clustering and variation in the literature. Ask your evaluators to tailor these to your study context. Assumes an equal number of control practices.*

- Detectable effects are similar for hospitalizations and worse for bed days

# Use All Patients to Assess Quality of Care and Experience

- For quality of care and satisfaction outcomes:
  - There is much less variation in measures that take on a limited number of values (typically true of survey items, quality indicators)
  - It is plausible to alter these outcomes for all patients
  - With 10 treatment practices, it is possible to detect a roughly 25% change, equivalent to moving the mean from 50% to 63%
  - With 20 treatment practices, it is possible to detect effects of moving the mean from 50% to 57%
  - Can measure these outcomes for all patients, but only need to include a fraction of patients at each practice for evaluation



# Rethink the Number of Patients from Whom Data Are Collected for Key Outcomes

**Save money.** If including more patients per practice increases data collection costs, it might be worth sampling 100 of the patients in each practice (or even fewer, depending on the outcome). Gathering data from more patients doesn't improve the chance of detecting effects of a given size.



# Summary: How Can We Learn More

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- Focus evaluations on quality, cost, and experience
- Select comparison practices that are comparable at baseline
- Recognize that the PCMH is a practice-level intervention and account for clustering
- Include as many intervention practices as possible
- Be strategic in identifying the right samples of patients to answer each evaluation question
- Rethink the number of patients from whom data are collected to answer key evaluation questions

# Guidance for Evaluators and Implementers

Available at <http://www.PCMH.AHRQ.gov>

- **White Papers and Decisionmaker Briefs**
  - This evidence review
  - Improving Evaluations of the Medical Home
  - Building the Evidence Base for the Medical Home: What Sample and Sample Size Do Studies Need?
  - Coordinating Care in the Medical Neighborhood
  - Serving Adults with Complex Health and Social Support Needs
- **Developing and Running a Practice Facilitation Program for Primary Care Transformation: A How-To Guide**
- **Searchable citations database**
- **Catalogue of federal PCMH activities**