Evaluating Innovations in Real Time: Packaging and Spreading Innovation

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Outline

- Innovation and diffusion: "a perfect complexity"
- Implications for evaluation
- Examples from the literature
- Summary

General Internal Medicine: *e pluribus unum*

- Value-adding activities of primary care
  - Triage
  - Navigation
  - Primary prevention
  - Screening
  - Acute care
  - Chronic illness management
  - End-of-life care
  - Psychosocial care

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Life on "Eye Street"

- Innovation
- Intervention
- Implementation
- Improvement

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Challenge to Evaluators: "Doubling Down" on Complex Interventions

- Payment scheme
- Practice management redesign
- Staffing change
- Clinician behavior modification program
- Patient behavior modification program
- Communications project
- Health information technology project

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What is an innovation?

Idea, practice, or tool that is perceived as new by the individual or other "unit of adoption"

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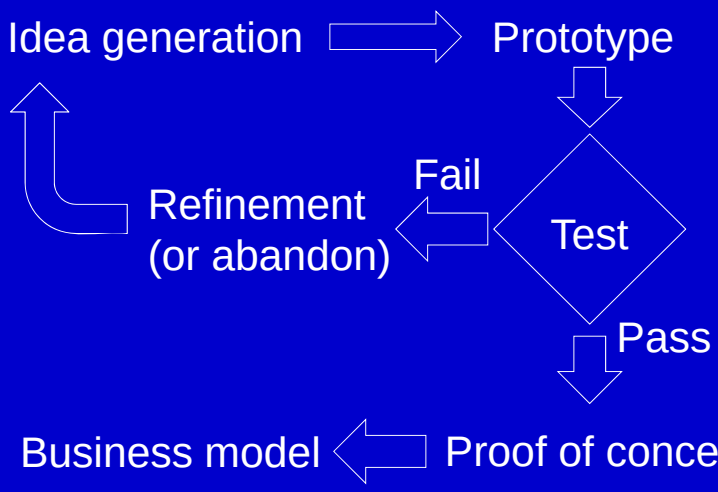
Entrepreneurial Innovation: Prototype Evaluation



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Zones and Types of Product Innovation

PRODUCT LEADERSHIP ZONE	CUSTOMER INTIMACY ZONE	OPERATIONAL EXCELLENCE ZONE	CATEGORY RENEWAL ZONE
Disruptive Innovation	Line-Extension Innovation	Value-Engineering Innovation	Organic Innovation
Application Innovation	Enhancement Innovation	Integration Innovation	Acquisition Innovation
Product Innovation	Marketing Innovation	Process Innovation	Harvest and Exit
Platform Innovation	Experiential Innovation	Value-Migration Innovation	

Moore, G. Dealing with Darwin, 2005

To improve quality, innovations are critically dependent on diffusion

- Diffusion is the process by which an ***innovation*** is ***communicated*** through certain ***channels*** over ***time*** among members of a ***social system***

Linear ("Rational") Model of Diffusion

Innovator

Receiver

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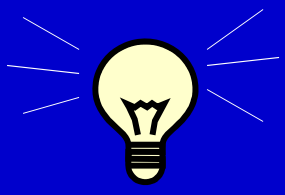
Linear ("Rational") Model of Diffusion



Innovator

Receiver

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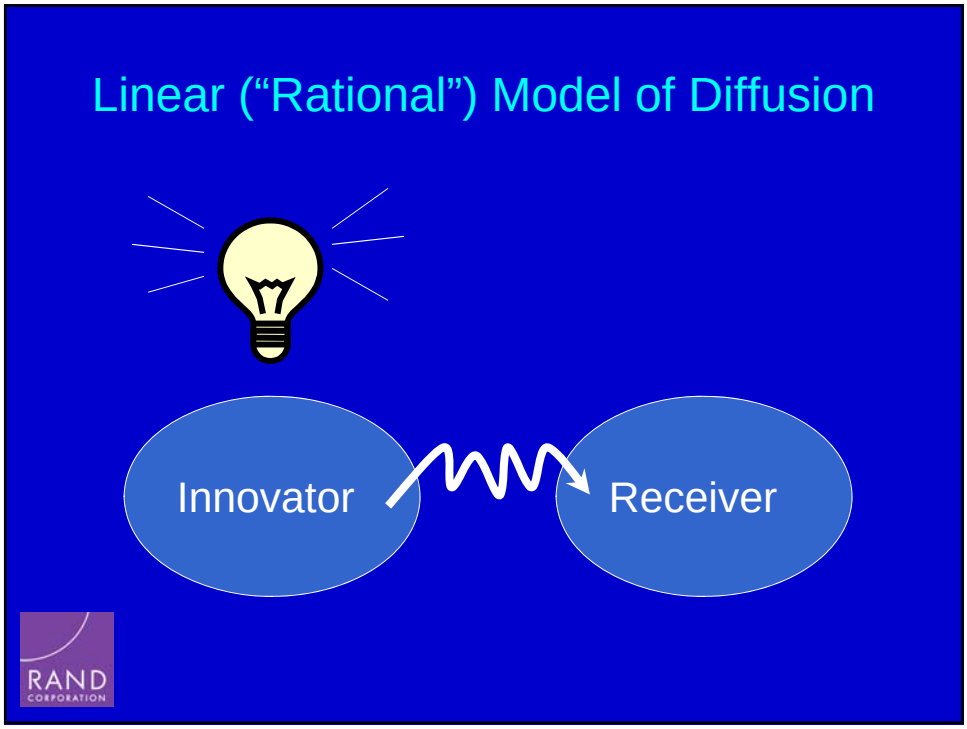
Linear (“Rational”) Model of Diffusion
Innovator
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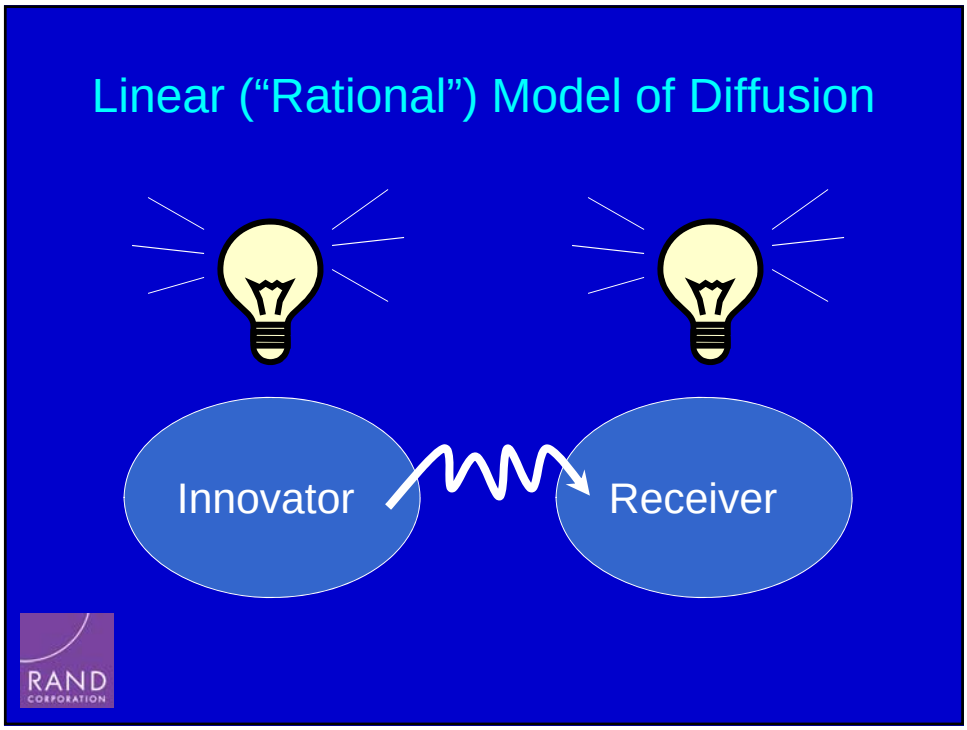
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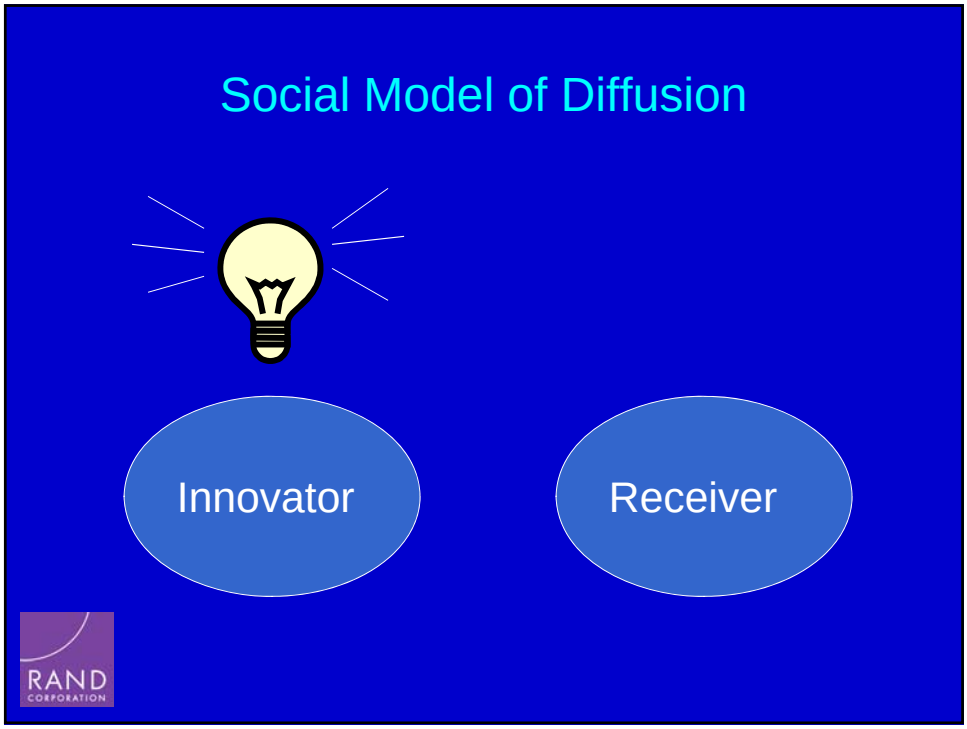
Social Model of Diffusion
Innovator
Receiver
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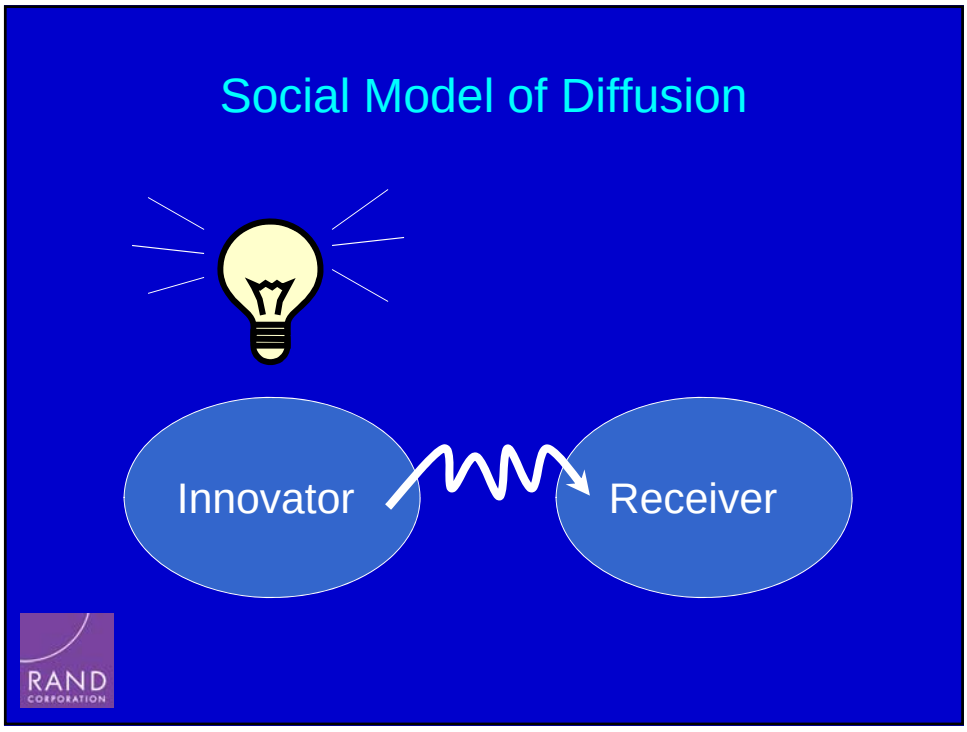
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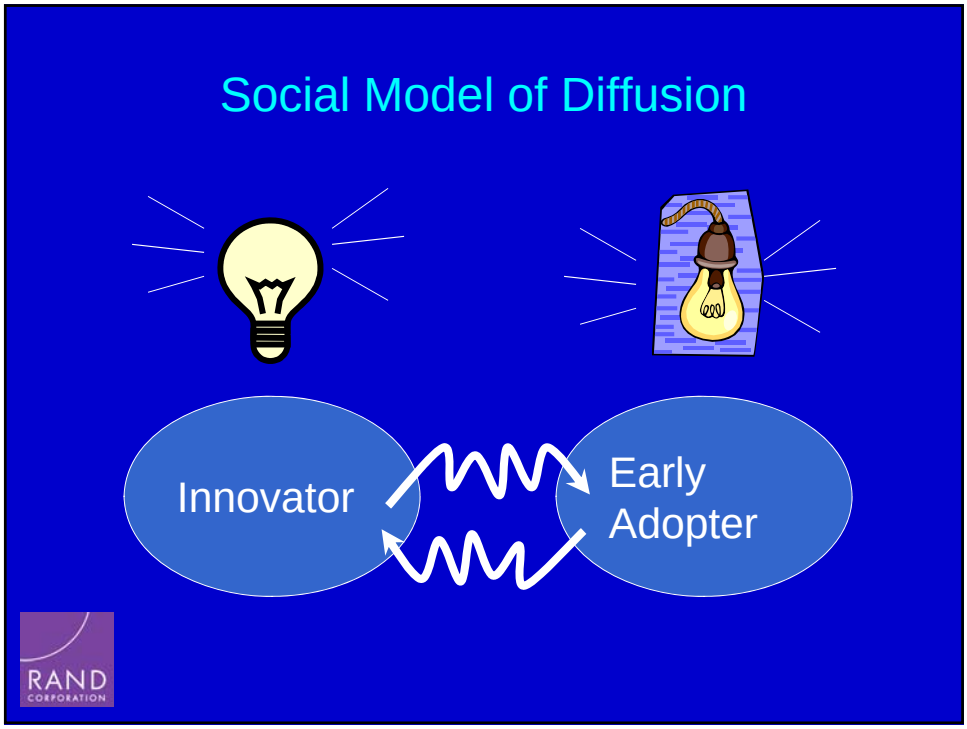
Social Model of Diffusion
Innovator
Early Adopter
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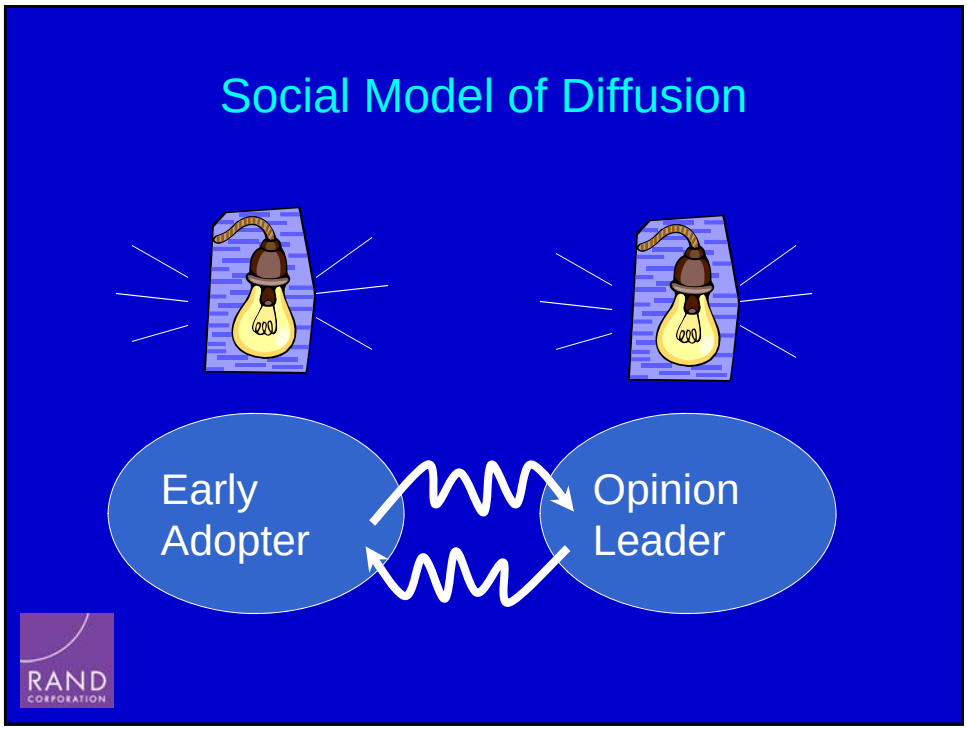
Social Model of Diffusion
Early Adopter
Opinion Leader
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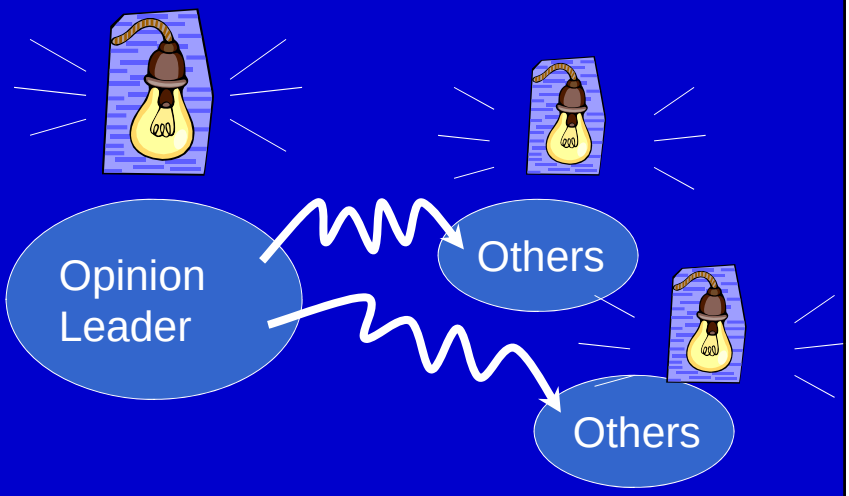
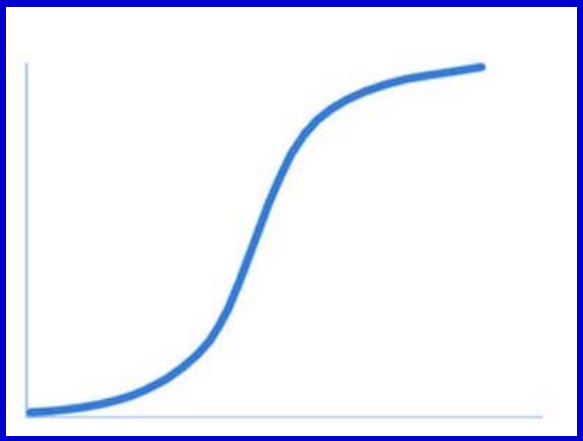
Social Model of Diffusion



Take Up of Successful Innovations

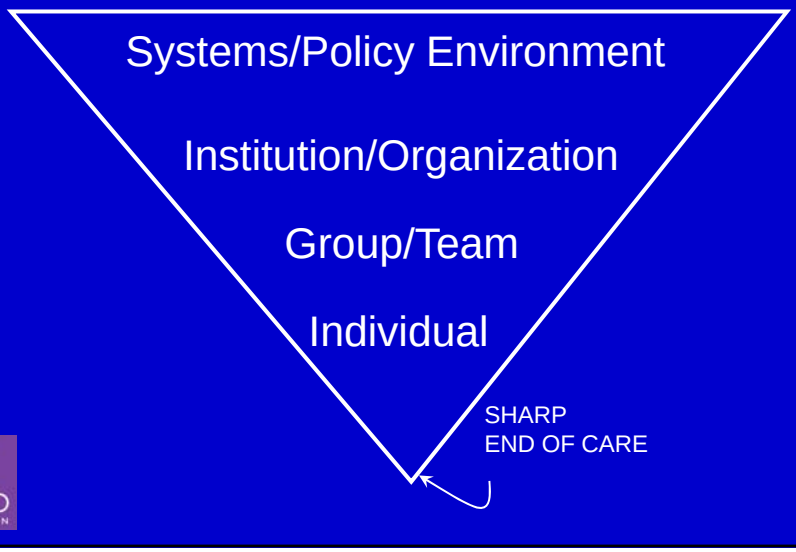


Characteristics of an innovation that enhance diffusion

- Simplicity
- Relative advantage
- Trialability
- Capacity for reinvention
- Compatibility
- Observability

Berwick D, JAMA, 2003

Context Factors



Implications for Evaluators

- High risk of failure or "partial success"
- Frame the target and purpose of the evaluation
  - Innovations are nearly always modified in practice
  - Context factors can trump take up
- Timing of measurements is critical
  - Median "time to take up" is difficult to predict
  - Take up is almost never 100%
- Analysis and interpretation are challenging
  - Partial take up is difficult to interpret
  - Comparison groups are critical

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Key Framing Questions for Real-time Evaluation

- What is the evaluation intended to do?
  - Is the main focus learning or accountability?
- Who will use the evaluation results and for what purpose?
- What decisions will rely on this evaluation?

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Specifying the Intervention

- Specify a Logic Model
  - Components of the innovation/intervention "package"
  - Rationale for inclusion of each component of the innovation/intervention
  - Implementation plan
  - Expected outcomes

Data Collection

- Avoid collecting data for underpowered comparisons
- Use key informant interviews
  - Assess fidelity
  - Document unexpected changes to the innovation/intervention package
- Attempt to obtain all relevant perspectives
  - Involve leaders in study design

Control Charts: Use with Caution

- Fun Facts
  - Shewhart believed that choice of control limits was a convenient heuristic that lacked an empirical basis
  - Deming said that control charts are not useful for hypothesis testing

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Example 1
Geisinger ProvenCare

- Single payment for all CABG service and post-op complications (warranty)
  - Pay-for-performance on 40 care elements
- Evaluation
  - 137 patients pre-intervention vs. 117 patients post
  - Charges for CABG patients fell 5%, 16% reduction in total LOS (not post-op LOS)
  - 30-day readmissions fell from 7.1% to 6%
  - Adherence to care elements increased from 59% to 100%
  - No change in 19 health outcomes

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Example 2
PROMETHEUS Bundled Payment Demonstration

- Bundle payment based on pre-defined clinical episode
  - "evidence-informed case rates"
- 21 bundles
  - chronic and acute conditions, procedures
- Attempts to separate "probability risk" (random events) from "technical risk" (potentially avoidable complications)
  - Insure probability risk but not technical risk

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PROMETHEUS designed to address anticipated feasibility issues

- Defining the services included in a bundle
- Defining the payment method
  - Formulas for sharing financial risk while redesigning care
- Implementing quality measurement
- Determining physician and hospital accountability
- Engaging physicians
- Implementing care redesign

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Hussey P et al, Health Affairs, 2011

PROMETHEUS Pilot Site Experience (2008-2011)

- 5 pilot sites
  - 2 dropped out before starting
    - Financial cutbacks
    - Limited opportunity for improvement (AMI care)
  - 2 chose chronic medical condition focus, 1 chose procedure focus
  - None were able to implement contracts over 2 years

Hussey P et al, Health Affairs, 2011

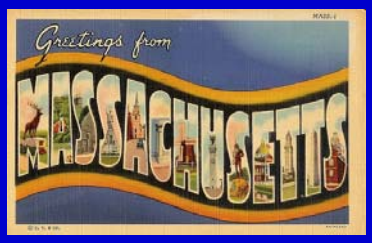
PROMETHEUS Challenges

- Fee-for-service claims data and PROMETHEUS software identified erroneous “episodes, typical care, and potentially avoidable complications”
- Language barriers
  - Unfamiliar terminology, population vs. patient frame
- Skepticism about achievable goals
  - 50% reduction in potentially avoidable complications
- Inability to agree on payment incentive structure
- Where is the investment for care redesign?

Hussey P et al, Health Affairs, 2011

Example 3
BCBSMA Alternative Quality Contract (2009 – 2014)

- Combines global payment and pay-for-performance
  - 5-year contract
  - Includes downside risk
  - PCP designation mandatory (referral authorization)
  - FFS claims with year-end reconciliation
- P4P up to 10% of budget (pre-set thresholds)
- Insurer assists with regular reports on spend, utilization, quality



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AQC Study Population.

Table 1. Characteristics of the Study Population.*

Characteristic	All Intervention Groups (N=380,142)		Control Group (N=1,351,446)	
	Before Implementation of AQC (2006–2008)	After Implementation of AQC (2009)	Before Implementation of AQC (2006–2008)	After Implementation of AQC (2009)
Age (yr)	34.4±18.6	35.3±18.5	35.3±18.7	35.5±18.8
Female sex (%)	52.6	51.2	51.8	51.0
Health risk score†				
Mean	1.08	1.16	1.11	1.16
Interquartile range	0.12–1.29	0.13–1.39	0.11–1.33	0.12–1.39

Song Z et al. N Engl J Med 2011;365:909-918.

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The NEW ENGLAND JOURNAL of MEDICINE

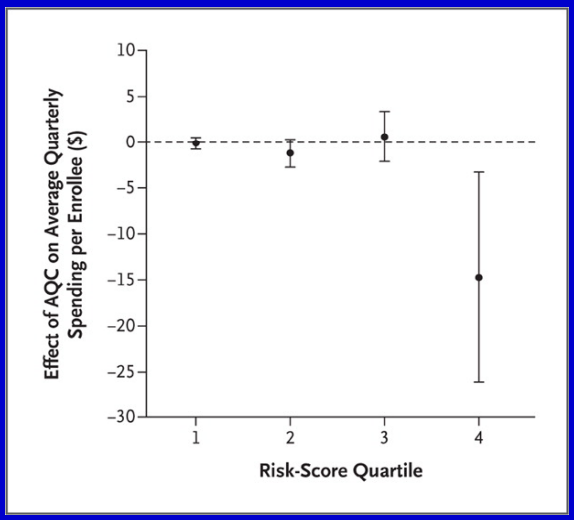
Change in Average Health Care Spending per Member per Quarter in the Intervention and Control Groups

	Intervention (change)	Control (change)	Difference	
Spending Category		U.S. $		P-value
Total quarterly	53	69	-15.51	0.009
E and M	25	27	-2.22	0.002
Procedures	10	16	-5.96	0.001
Imaging	8	11	-3.47	<0.001
Test	7	11	-3.72	<0.001
Outpatient facility	16	30	-14.50	<0.001

Non-significant spending changes: Inpatient, outpatient professional services, ancillary services

Song Z et al. N Engl J Med 2011;365:909-918.

Difference-in-Differences Estimates of the Effect of the Alternative Quality Contract (AQC) on Average Health Care Spending.



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AQC Key Insights

- AQC contract associated with modestly lower spending in year 1
- Savings primarily among high-risk enrollees
  - Not a Medicare population
- Savings generated by steering patients to organizations with lower fees
  - Not reductions in utilization
- Quality improved on included measures

Song Z et al. N Engl J Med 2011;365:909-918

Summary of Approach to Evaluation

- Independent, but closely engaged implementer and evaluator teams
- Careful specification and agreement on logic models beforehand
  - Pilot phase if feasible to establish intervention and instruments
- Rely heavily on guided interviews with multiple key informants
- "Light-touch" data collection ("PDSA-like")

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Publishing, not Perishing

- Describe context
- Identify the novel question
- Emphasize comparison groups
- Don't oversell modest results
- Make failure interesting

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