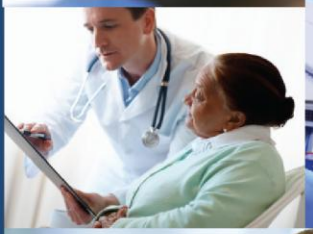
The Value of Infectious Diseases Specialists



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Value is central to reform

Conversation in health care reform is focused on ***Value***

Critical questions:

- What value does each specialty contribute?
- Can specialty care actually bend the cost curve?

$$\text{Value} = \frac{\text{Quality}}{\text{Cost}}$$

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Evidence for ID Value

- Link between ID interventions and positive patient outcomes.*
- When the attending physician follows ID recommendations:
  - Patients are more often correctly diagnosed
  - Have shorter length of stays
  - Have fewer complications
  - Use antibiotics more judiciously

* See supporting literature cited in Schmitt et al. Infectious Diseases Specialty Intervention Is Associated With Decreased Mortality and Lower Healthcare Costs. Clin Infect Dis. (2013) doi: 10.1093/cid/cit610 First published online: September 25, 2013

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Objective of New Research: Proof of Value

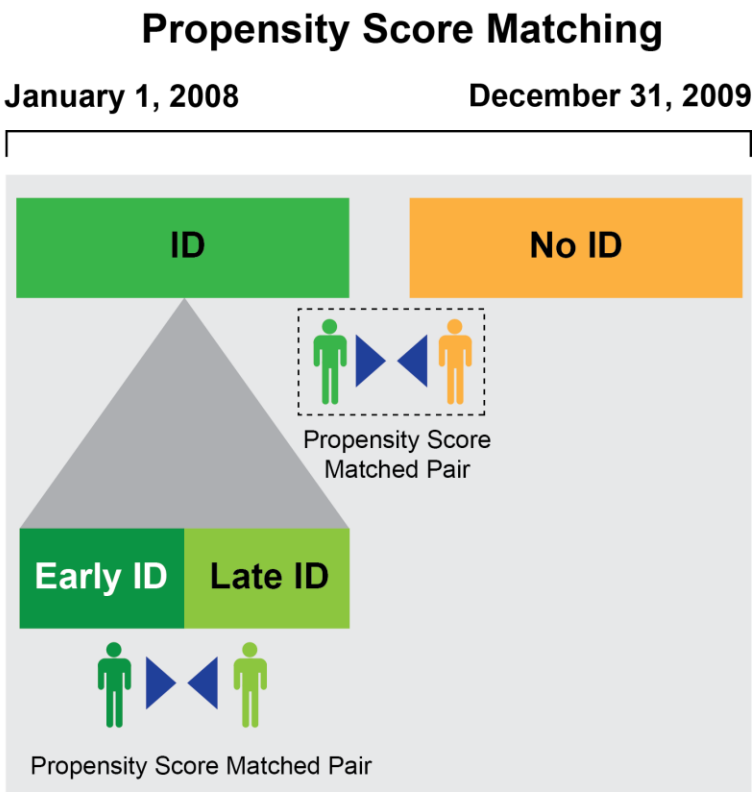
- To generate more robust data regarding the impact of ID consultation using a national claims database
- Outcomes significant in the health care reform conversation
  - Mortality
  - Readmission rate
  - Length of stay
  - Resource utilization

Methods

Study population

Medicare fee-for-service patients with inpatient hospitalizations

- Clostridium Difficile Infection
- Central Line Associated Bloodstream Infections
- Bacterial Endocarditis
- HIV
- Meningitis
- Osteomyelitis
- Prosthetic Joint Infections
- Septic Shock
- Vascular Device Infections
- Bacteremia
- Septic Arthritis



The matched sample included 61,680 ID cases and 65,192 non-ID cases

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Results: NO ID vs ID

Outcome	No ID	ID	p-Value	OR/%Δ (95% CI)
Index stay length of stay	9.5	9.6	0.001	1.3% (+0.5% – +2.1%)
Index stay ICU days [a]	6.7	6.4	<0.001	-3.7% (-5.5% – -1.9%)
Index stay mortality (%)	10.7	9.8	<0.001	0.87 (0.83 – 0.91)
30-day mortality (%) [b]	8.7	7.7	<0.001	0.86 (0.82 – 0.90)
30-day readmission rate (%) [b]	22.7	22.1	0.009	0.96 (0.93 – 0.99)
Medicare payments to ACH for index stay	$15,850	$15,799	0.435	-0.3% (-1.1% – +0.5%)
Medicare payments for index stay	$18,017	$18,076	0.397	+0.3% (-0.4% – +1.1%)
Medicare payments for 30-day episode [b]	$7,706	$7,858	0.069	+2.0% (-0.2% – +4.1%)

Abbreviations: ICU, Intensive Care Unit; ACH, Acute care hospital; PAC, Post acute care; OR, odds ratio; %Δ, percent difference.
[a] Only patients with one or more ICU days.
[b] Excludes patients expiring in the hospital.

"Having an ID Specialist involved in the care of a patient with a severe infection will lead to better outcomes"

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Results: “Early” vs “Late”

Outcome	Early	Late	p-Value	OR/%Δ (95% CI)
Index stay length of stay	13.2	13.8	<0.001	-3.8% (-4.8% – -2.9%)
Index stay ICU days [a]	7.6	8.1	<0.001	-5.1% (-7.7% – -2.4%)
Index stay mortality (%)	7.1	7.5	0.122	0.94 (0.88 – 1.02)
30-day mortality (%) [b]	8.6%	9.6	<0.001	0.87 (0.82 – 0.93)
30-day readmission rate (%) [b]	24.6	26.1	<0.001	0.92 (0.89 – 0.96)
Medicare payments to ACH for index stay	$18,111	$18,728	<0.001	-3.3% (-4.3% – -2.3%)
Medicare payments for index stay	$21,453	$22,207	<0.001	-3.4% (-4.3% – -2.5%)
Medicare payments for 30-day episode [b]	$8,739	$9,318	<0.001	-6.2% (-8.8% – -3.5%)

Abbreviations: ICU, Intensive Care Unit; ACH, Acute care hospital; PAC, Post acute care; OR, odds ratio; %Δ, percent difference.
[a] Only patients with one or more ICU days.
[b] Excludes patients expiring in the hospital.

“Early involvement of an ID Specialist in the care of patients with severe infection will lead to better outcomes with lower costs”

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Limitations

- Measuring hospital mortality may overstate the impact of ID intervention on mortality
- Unobserved reasons for selection of patients to receive an ID intervention may confound the results
- The PSM methodology excludes some of the sickest people in the ID intervention group, because they had no matches from the non-ID intervention group (patients who were too dissimilar were not included in the analysis)
  - The results therefore may not fully reflect the impact of ID interventions, since it did not take the care for these severe cases into account

Implications

- **ID** involvement leads to improved patient outcomes AND **Early ID** interventions result in improved outcomes and reduced costs
  - Patients seen by an ID specialist are
    - 9% less likely to die in the hospital
    - 12% less likely to die post-discharge
    - Spend 3.7 % less time in the ICU
- These results suggest a critical role for ID consults for select, severe infections
- Consider these results in light of current core measures such as “all-cause” mortality, pneumonia, CLABSI, and CAUTI

Other areas where ID can add value

- ID specialist-led Antimicrobial Stewardship and Diagnostic Stewardship
- Transitions of care for complex infections
- Outpatient Parenteral Antimicrobial Therapy (OPAT)
- Employee health
- Resource management and Microbiology laboratory oversight

Innovation by collaboration on value

- Gain-sharing agreements
- Co-management services agreements

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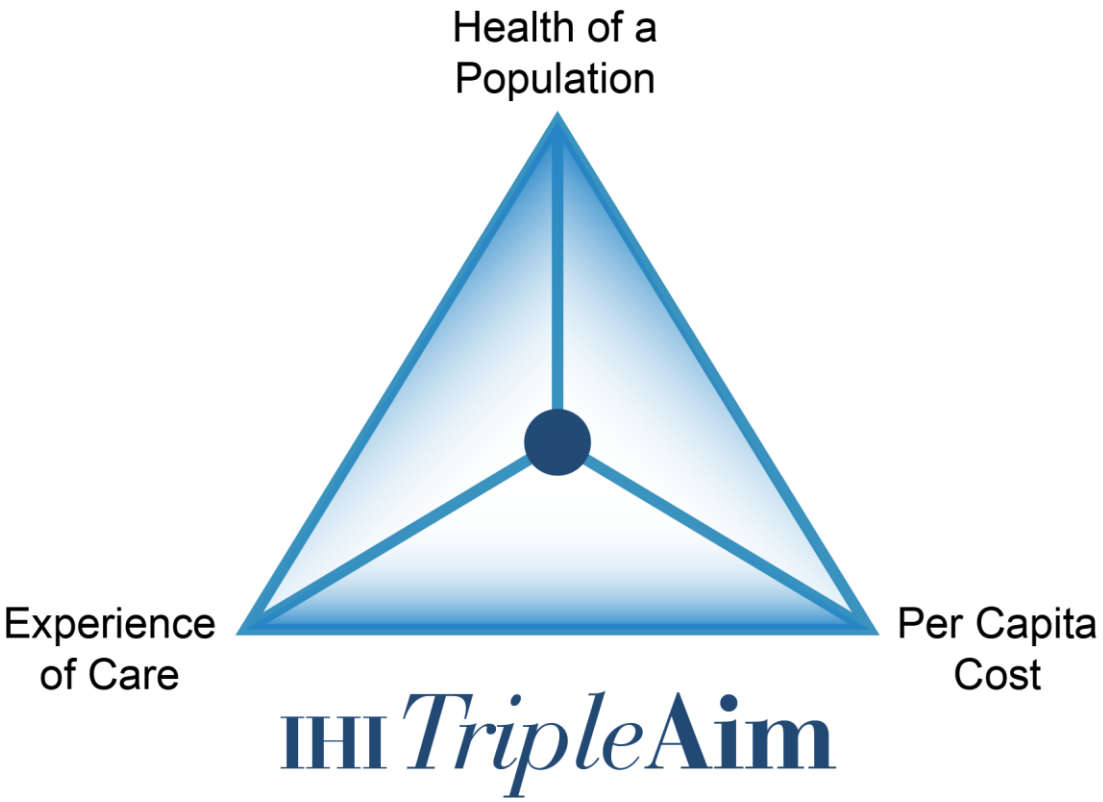
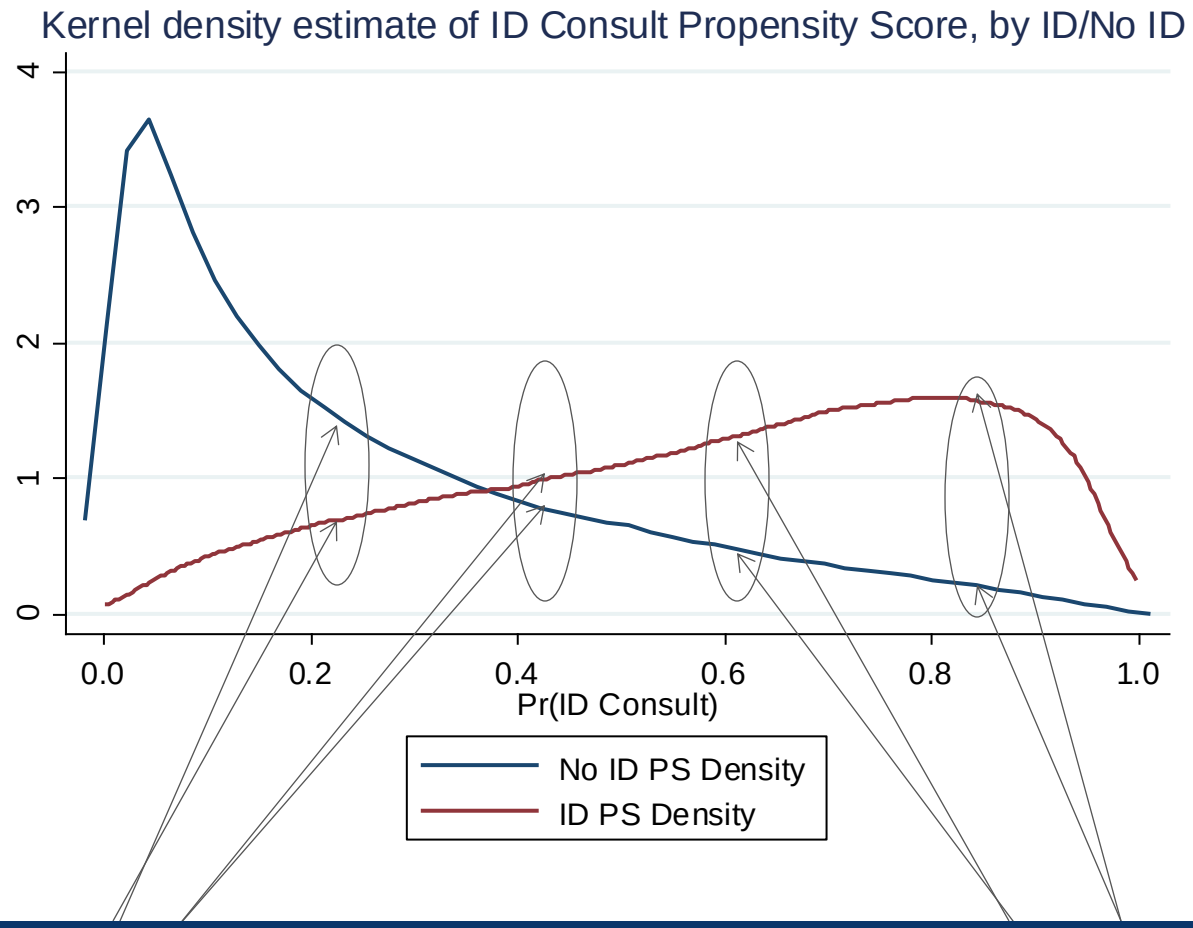
Back-Up Slides

ID Specialists Contribute to Achieving "The Triple Aim"



* Institute for Healthcare Improvement. See more information at http://www.ihi.org/offerings/Initiatives/TripleAIM/Pages/default.aspx

Propensity Score Matching



ID vs No ID Paired Cases via PSM

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ID plays a leading role in health care systems

- **Core measures such as pneumonia, CLABSI, CAUTI**- maximize reimbursement and save lives!
- **Antimicrobial stewardship programs** - reduce drug costs and curtail resistance!
- **Infection prevention** - save lives and reduce costs!
- **Care transitions** - right diagnosis, right drugs, effective follow-up in outpatient parenteral antibiotic programs.