

Background

- Rehospitalizations for those with chronic diseases are unfortunate, costly, and far too $\operatorname{common.}(1-2)$
- Numerous strategies have been examined to reduce rehospitalization rates while maintaining or improving the quality of care.
- Examples include identifying and monitoring those at greatest risk, implementing various case management/disease management programs, and increased monitoring of concomitant medications. (3-6)
- Another such method gaining increased attention is coordination of care such as through increased use of primary care services. (7-8)
- Not enough is known about what impact increased use of primary care services will have on readmission rates.

Objective

• The objective of this study was to predict the impact of using more primary care services on hospital readmission rates for those with selected chronic conditions. -We conducted an analysis to see if visiting a physician or physician extender after a hospitalization reduced the chance of readmissions within 7 days, 30 days (a CMS benchmark), or 90 days after the initial hospitalization.

Data Sources

- Data were from the Ingenix IMPAQ Research and Development database.
- This database includes enrollment, medical, and pharmacy claims data for 53 million members for 2005 - 2008.

Patient Inclusion Criteria

- •Age 18-64.
- Continuously enrolled during January 1, 2005 September 30, 2008.
- Had claims data linkable to zip code information about socioeconomic factors.
- Had one or more of the following seven chronic conditions:
- -Diabetes
- -Coronary artery disease
- -Congestive hearth failure
- -Chronic obstructive pulmonary disease (COPD)
- –Asthma
- -Depression
- -Chronic renal failure

Grouping Methods

- The Symmetry Episode Treatment Group (ETG) software was used to find patients with the conditions of interest and the Symmetry Episode Risk Group (ERG) software was used to estimate their health status.
- The ETG software used information about demographics and diagnosis codes to find patients with the seven chronic conditions of interest.
- -ETGs are generated by combining demographic and diagnostic data from facility and professional claims into categories that describe episodes of treatment for many conditions.
- The ERG score is a variable that predicts how costly a patient is expected to be (relative to the average patient in a benchmark population) in the next year, based on his or her age, gender, and medical conditions.

-This variable provides a rough proxy for health status, under the assumption that healthier patients generally are expected to cost less in the future year.

Association Between Additional Primary Care Services and Readmission Rates

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Study Design

- After applying the inclusion criteria, medical claims from 409,717 continuously enrolled, chronically ill members were included in this study.
- Multiple regression analyses were used to estimate the impact of having more primary care services on the likelihood of readmission, controlling for socioeconomic factors, plan type, and health status.
- The regression analyses adjusted for the following independent variables: member demographics (age, gender, region of residence [Midwest, West, South, Northeast], urban-rural status, minority status, income status, existence or not of each of the chronic conditions of interest listed, ERG Risk Score, and diagnosis or not of obesity
- The following were based on zip code of area of residence: –Urban-rural status (micropolitan [10,000-50,000 inhabitants], metropolitan [50,000 or more inhabitants], or rural [below 10,000 inhabitants]). -Minority status (high [60% or more non-white], medium [between 15%-60% non-

white], or low [15% or less non-white]).

-Income status (low [less than \$29,797], lower-medium [between \$29,797-\$36,250], upper-medium [between \$36,250-\$45,762], or high [\$45,762 or more]).

Statistical Methods

• Readmissions were measured between 1-7, 1-30, and 31-90 days after discharge.

- Readmissions were modeled separately for:
- –Same condition as original admission
- –Any condition

• Proxies were based on services provided by "professionals" in "outpatient office" or "office visit" settings.

-Having one or more outpatient claims between hospitalizations.

-Having one or more outpatient claims billed by a primary care physician (PCP) between hospitalizations.

-Having one or more outpatient claims billed by a PCP or physician extender (PE) between hospitalizations.

-The ratio of PCP to all provider outpatient claims in the year prior to

hospitalization was used to proxy previous primary care services use.

• Logistic regression analyses were used to investigate the impact of additional primary care services on readmission rates.



Sample Measures

• In 2007:

- -The average ratio of PCP to total outpatient claims in the year was 41%.
- -The average ratio of PCP+PE to total outpatient claims in the year 2007 was 45%. -78% had at least 2 PCP outpatient claims in a year.
- -20% had at least 1 PCP+PE outpatient claims in a year.
- Readmission patterns are shown in the figure below.
- Other years were similar.

Results from the Logistic Regression on Admission Rates

• In the 7 day analysis:

-4.7% of those hospitalized were readmitted within 7 days.

–Of those readmitted, 24% had at least one outpatient service after the initial discharge but prior to readmission.

-The regression analysis found the likelihood of readmission to be significantly *lower* (between 30% - 38%, depending on the method used to measure primary care services) if there was an outpatient service between discharge and readmission.

• In the 30 day analysis:

-11.3% of those hospitalized were readmitted within 30 days.

-Of those readmitted, only 46% had at least one outpatient service after the initial discharge but prior to readmission.

-The regression analysis found the likelihood of readmission to be significantly *lower* (between 46% - 64%, depending on the proxy) if there was an outpatient service between discharge and readmission.

• In the 31-90 day analysis:

-7.6% of those hospitalized were readmitted between 31-90 days.

-Of those readmitted, 87% had at least one outpatient service after the initial discharge but prior to readmission.

-The regression analysis found the likelihood of readmission to be significantly higher (between 10% - 75%, depending on the method used to measure primary care services) if there was an outpatient service between discharge and readmission.

• Prior year primary care services did not influence readmissions.



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Conclusions and Study Implications

• The impact of additional primary care physician services on readmission rates depends on how soon the readmission occurs.

-If the readmission is within 30 days after discharge, outpatient care prior to the

readmission was associated with a significantly lower probability of readmission. -If the readmission was after 30 days, outpatient care prior to readmission was

associated with a significantly higher probability of readmission. -Therefore, earlier use of primary care services appear to reduce the rate of readmissions and should be investigated.

• Treatment in previous years had a small impact on the outcomes of interest. • Efforts to support the use of primary care services shortly after hospital discharge should be promoted.

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