Hospitalization Patterns for All Causes, CV Disease and Infections under the Old and New Bundled Payment System

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Methods
Hospital admission rates

- Study subjects were monthly period prevalent dialysis patients from January to September, from 2009 to 2011.
- Centers for Medicare and Medicaid Services SAFs provided inpatient data for 2009 and 2010, and QSAFs provided data for 2011.
Inclusion criteria

- Included patients were age 20 and older, were residents of the 50 U.S. States, the District of Columbia, Puerto Rico, and Territories, and reached day 90 of ESRD.
- Patients known to be on hemodialysis or peritoneal dialysis patients were studied.
- Counts ranged from 252,190 in February 2009 to 279,907 in August 2011.
- In January 2011, 83.6% of study patients had dialysis providers with bundled rates, 7.7% had blended rates, and 8.8% were unknown. Findings were similar when analyses were restricted to patients in the bundle.
Rate calculation

• For time at risk for hospital admission in a given month, the following criteria had to apply:
  ▪ > 90 days elapsed since starting dialysis
  ▪ no gap in Medicare claims activity > 60 days.
• Follow-up within a given month was censored at the earliest occurrence of death, a claims gap reaching 60 days, or the end of the month.
• Dialysis modality was defined during the first dialysis claims period in the month and was intent-to-treat within each month.
• ICD-9-CM diagnosis codes were used for calculating cause-specific admission rates.
• Methods were similar for calculating days in hospital, except that hospital days were included in the denominator.
Re-hospitalization

- First quarter discharges were included from January 1 to March 31 of each year.
- Patients with at least one discharge after day 90 following RRT initiation were included.
- Discharges were excluded with a gap in claims data during the 30-day post discharge period.
- Rehabilitation claims, transfers, and discharges with a same-day admission to long-term care and critical access hospitals were excluded.
Patient characteristics: Values shown for January of each year

- Age
- Gender
- Race
- Primary cause of ESRD
- Dialysis modality

- 2009 (N=253,346)
- 2010 (N=266,130)
- 2011 (N=276,863)
Hospital Admissions

Day of Month 1 to 31

In Hospital 6 to 10

Time at risk 28 days = 28 / 31 = 0.903 patient months

Rate 1 / 0.903 = 1.1 admissions per patient month
All-cause hospital admission rates

Admissions per 100 patient months

Jan Feb Mar Apr May Jun Jul Aug Sep

2009
2010
2011
CV hospital admission rates

Admissions per 100 patient months

2009
2010
2011

Jan Feb Mar Apr May Jun Jul Aug Sep
Sepsis/bacteremia hospital admission rates

Admissions per 100 patient months

- 2009
- 2010
- 2011

Jan Feb Mar Apr May Jun Jul Aug Sep
Pneumonia hospital admission rates

Admissions per 100 patient months

2009
2010
2011
Vascular access infection hospital admission rates (hemodialysis only)
Hospital Days

Day of Month: 1 to 31

In Hospital: 6 to 10

Time at risk: 31 days = 1 patient month

Rate: 4 / 1 = 4 days per patient month
All-cause hospital day rates

Hospital days per 100 patient months

- 2009
- 2010
- 2011

Jan Feb Mar Apr May Jun Jul Aug Sep
Cardiovascular hospital day rates

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Infectious hospital day rates

Hospital days per 100 patient months

- Gray: 2009
- Green: 2010
- Red: 2011
Sepsis/bacteremia hospital day rates

Hospital days per 100 patient months

- 2009
- 2010
- 2011
Pneumonia hospital day rates

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Vascular access infection hospital day rates (hemodialysis only)

![Graph showing hospital days per 100 patient months for 2009, 2010, and 2011. The graph indicates a general increase in hospital days from January to September.](image)
30-day rehospitalization and/or death rate following live discharges from all-cause hospitalizations during the first quarter.
Conclusions
Comparing similar time periods before and after the bundle

- **Hospital admission rates**
  - All-cause \(\uparrow\) January only; otherwise \(\downarrow\) than 2010
  - CV \(\downarrow\)
  - Infectious \(\uparrow\) January and February
    - Sepsis/bacteremia \(\uparrow\)
    - Hemodialysis vascular access infection \(\downarrow\)
    - Pneumonia \(\uparrow\) January, February, and May

- **Days in hospital**
  - All-cause \(\downarrow\) than 2010 after January
  - CV \(\downarrow\)
  - Infectious Similar
    - Sepsis/bacteremia \(\uparrow\) January to April
    - Hemodialysis vascular access infection \(\downarrow\)
    - Pneumonia \(\uparrow\) January and February

- **30-day re-hospitalization**
  - After all-cause discharge Similar
  - After CV discharge Similar
  - After infectious discharge Similar