Overview of the ESRD Program: trends, projected growth and infectious hospitalizations

Allan J. Collins, MD, FACP
Professor of Medicine
University of Minnesota

Director, USRDS Coordinating Center
NIH, NUDDK, DKUHD
Disclosures

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- Stock: Physician Nexus
Current status of dialysis in the United States

• Trends in both incident and prevalent rates
• Hospitalization, re-hospitalization and mortality trends
• Three times per week hemodialysis and hospitalization rates by day of the week
• ESRD Projections to 2020
Patient counts, by modality

Figure p.3 (Volume 2)

Number of patients (in thousands)

<table>
<thead>
<tr>
<th>Year</th>
<th>Incident ESRD</th>
<th>Prevalent transplant</th>
<th>Prevalent dialysis</th>
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<tr>
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<td>116,395</td>
<td>172,553</td>
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<td>08</td>
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</table>

Incident & December 31 point prevalent ESRD patients.
Adjusted incident rates of ESRD & annual percent change

Figure 1.3 (Volume 2)

Incident counts & adjusted rates of ESRD, by age

Figure 1.5 (Volume 2)

Incident counts & adjusted rates of ESRD, by primary diagnosis

Figure 1.8 (Volume 2)

Incident ESRD patients.
Adj: age/gender/race; ref: 2005 ESRD patients.
Adjusted prevalent rates of ESRD & annual percent change

Figure 1.9 (Volume 2)

December 31 point prevalent ESRD patients.
Adj: age/gender/race; ref: 2005 ESRD patients.
Prevalent counts & adjusted rates of ESRD, by race

Figure 1.12 (Volume 2)

December 31 point prevalent ESRD patients. Adj: age/gender; ref: 2005 ESRD patients.
Prevalent counts & adjusted rates of ESRD, by primary diagnosis

Figure 1.14 (Volume 2)

December 31 point prevalent ESRD patients.
Adj: age/gender/race; ref: 2005 ESRD patients.
Trends in Incidence and Prevalence of ESRD

• Incidence rates remain stable
  - The 45-64 year old age group has a linear growth in the absolute count reaching ESRD
  - Incidence rates for glomerular diseases are down to levels noted in the early 1980s
  - Incidence rates due to diabetes have been flat for 8 years, however, prior ADRs have shown younger black-African American rates have been rising

• Prevalence rates continue to rise likely the result of lower death rates.
Access use at first outpatient hemodialysis, by pre-ESRD nephrology care, 2009

Figure 1.19 (Volume 2)

Incident hemodialysis patients, 2009.
Access placements in prevalent hemodialysis patients, by diabetic status

Figure hp.13 (Volume 2)

Period prevalent hemodialysis patients with or without simple fistulas. Data from physician/supplier claims. Some patients may have more than one access at a given point in time.

USRDS 2010 ADR
Mean hemoglobin at initiation, by pre-ESRD ESA treatment

Figure 1.20 (Volume 2)

Incident ESRD patients.
Mean monthly hemoglobin & weekly EPO after initiation, by year

Figure 2.4 & 2.5 (Volume 2)

Incident dialysis patients.
Months with IV iron & total dose in the first six months of dialysis (EPO-treated patients)

Figure 2.6 (Volume 2)
Incident patient care as they start dialysis

• Catheters continue to be a major issue in that still 80% of patients start with a catheter
• Placement rates for catheters are at the lowest level since 1990
• Hemoglobin levels and ESA utilization have fallen at the start of dialysis
• Hemoglobin levels achieved in 2009 are lower than in 2001 yet ESA dosing has changed little
• Iron utilization has increased with almost 40% of incident patients receiving 2.7 gm in the first six months of ESRD treatment
Adjusted hospital admission rates & days, by modality

Figure 3.2 (Volume 2)

Change in adjusted all-cause & cause-specific hospitalization rates, by modality

Figure 3.1 (Volume 2)

Unadjusted hospitalization rates for infections, by major organ system & modality

Table 3.6 (Volume 2)

<table>
<thead>
<tr>
<th>Period</th>
<th>ESRD Patients</th>
<th>Unadjusted</th>
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<tbody>
<tr>
<td></td>
<td>Prevalent</td>
<td>Rate</td>
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<tr>
<td></td>
<td>HD</td>
<td>PD</td>
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<tr>
<td></td>
<td>2001</td>
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<td>Skin</td>
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<td>PD</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Transplant</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Genitourinary</td>
<td>40</td>
<td>30</td>
</tr>
<tr>
<td>HD</td>
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<td>25</td>
</tr>
<tr>
<td>PD</td>
<td>25</td>
<td>20</td>
</tr>
<tr>
<td>Transplant</td>
<td>20</td>
<td>15</td>
</tr>
</tbody>
</table>

Diagram showing trends over time for cardiac, skin, and genitourinary infections in prevalent ESRD patients.
Trends in hospitalizations

• Infectious hospitalization remain 43% higher than in 1993 despite markedly lower catheter placement rates
• Skin infection, bacteremia/sepsis and musculoskeletal (bone and joint) infections have increased while cardiac infection rates have declined only recently after rising since 1993
• The source of these infections continues to be a major concern
• Single hospitalizations are only part of the issue
Original Article

Long Interdialytic Interval and Mortality among Patients Receiving Hemodialysis

Robert N. Foley, M.B., David T. Gilbertson, Ph.D., Thomas Murray, M.S., and Allan J. Collins, M.D.

N Engl J Med
Volume 365(12):1099-1107
September 22, 2011
Annualized Death, CVD Admission Rates on Different Days of the Dialysis Week.

CMS-CPM random HD sample 2004-2007 N=32,065

This pattern is different from:
1. The general population
2. CDC NCHS data
3. PD population
4. Small number of 4+ runs per week in the sample

Data to be reported in Dr. Foley’s talk at ASN and in the NEJM letters
Hospitalization events are more common than appreciated (Roberts et al USRDS Poster ASN 2011)

- **Number of Hospital discharges**
  - 1: 42.4% at least one discharge within a year
  - 2: 23.7% at least two
  - 3: 13.7% at least three
  - 4: 8.1% at least four
  - 5+: 12.1% five or more discharges in a year

- **The substantial number of hospitalization impact needs to be addressed particularly re-hospitalizations to be addressed by Dr. Gilbertson**
Adjusted all-cause mortality rates (from day 90), by modality & year of treatment

Figure 5.1 (Volume 2)

Incident based death rates continue to decline even within the first year!
What does the future hold for growth of the ESRD population?

• Original projections to 2010 from 2004 ADR
• Projecting the ESRD population to 2020 (abstract ASN 2011)
Number of incident & point prevalent patients
Projected to 2010 (Presented at ASN 2004)

![Graph showing the number of patients from 1984 to 2010 with actual data to 2009 (571,000). The graph includes projections with 95% confidence intervals and indicates that the incidence and point prevalence have a high correlation with R² values of 99.8% and 99.7% respectively.](image-url)

- Actual data to 2009 (571,000)
- Incidence:
  - R² = 99.8%
- Point prevalence:
  - R² = 99.7%
Projection of ESRD population to 2020 (USRDS poster ASN 2011)

<table>
<thead>
<tr>
<th></th>
<th>Incidence</th>
<th>Prevalence</th>
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<tr>
<td></td>
<td>Projection</td>
<td>Actual</td>
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<td>111,110</td>
<td>111,193</td>
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<tr>
<td>2007</td>
<td>113,198</td>
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<td>2010</td>
<td>129,555</td>
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<tr>
<td>2020</td>
<td>142,858</td>
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Summary-1

- ESRD incident rates have been stable with prevalent growth driven by lower death rates
- Catheter use at the first out patient run is still very high
- Hemoglobins at initiation of dialysis have fallen
- Achieved Hb levels in 2009 are closer to 2001 yet ESA dosing is similar to 2005
- Overall hospitalizations have declined yet infection related admissions are still 43% higher than 18 years ago
Summary-2

- A number of organ system infection hospitalizations have been increasing despite less placements of dialysis catheter
- Multiple hospitalizations are a major issue as they are in the General population
- The long interdialytic interval on 3 times per week hemodialysis may be a contributor to repeated hospitalization
- New clinical trials are needed to address infection prevention and the high hospitalization rates