Assessing Adequacy of a Candidate for more Frequent Hemodialysis

Michel Chonchol, MD
Professor of Medicine
University of Colorado Denver
Aurora, CO, USA
Affiliations and Disclosures

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Incident & December 31 point prevalent ESRD patients; peritoneal dialysis consists of CAPD & CCPD.
Why Do So Many Patients Dialyze In-center, When...

...there is a nursing shortage
...in-center hemo 3 times a week is not physiologic
...in-center hemo has the most restricted diet & fluids
...symptoms limit patients’ work and activities
More Frequent Hemodialysis should be considered more often
Health Benefits of Frequent Hemodialysis

• Better small solute clearances
• Improved nutritional status
• Better BP and volume control
• Better anemia management
• Better calcium/phosphorus
• Fewer medicines
• Improved quality of life
• Fewer hospitalizations
• Possibly better survival

Psychosocial Benefits of Health Benefits of Frequent Hemodialysis

- More control
- Less disruption of day
- Less travel to clinic
- Better sleep
- More hours for work/play
- More time with family or friends; less time with sick or dying people
- Better sexual functioning

Improved Self-Management

A week in the life of a dialysis patient...

In-center HD

Frequent Hemo

Hours/Week on Own
Hours/Week at Clinic
FHN Study Design
Improved Self-Management

Daily In-Center
Patients from 10 regional centers

250 pts randomized over 46 mo.

12 months 6x/Week Daily In-center HD

12 months 3x/Week Conventional In-center HD

Compare outcomes after 1 year

# Main Outcome Domains

<table>
<thead>
<tr>
<th>#</th>
<th>DOMAIN</th>
<th>MAIN OUTCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cardiovascular structure/Function</td>
<td>∆ LV mass by cardiac MRI</td>
</tr>
<tr>
<td>2</td>
<td>Health related QOL/Physical function</td>
<td>∆ SF-36 physical health composite</td>
</tr>
<tr>
<td>3</td>
<td>Depression/burden of illness</td>
<td>∆ Beck depression index index</td>
</tr>
<tr>
<td>4</td>
<td>Cognitive function</td>
<td>∆Trail making B score</td>
</tr>
<tr>
<td>5</td>
<td>Nutrition/inflammation</td>
<td>∆ Serum albumin</td>
</tr>
<tr>
<td>6</td>
<td>Mineral metabolism</td>
<td>∆ Serum phosphorus</td>
</tr>
<tr>
<td>7</td>
<td>Survival/hospitalization</td>
<td>∆ Non-access hospitalization/death rate</td>
</tr>
<tr>
<td>8</td>
<td>Hypertension</td>
<td>Several outcomes</td>
</tr>
<tr>
<td>9</td>
<td>Anemia</td>
<td>Several outcomes</td>
</tr>
</tbody>
</table>

Co-primary Composite Outcomes
Death or Change in LV Mass

A Death or Change in LV Mass

![Graph showing survival and change in LV mass](image)

- Hazard ratio, 0.61 (95% CI, 0.46–0.82)
- P < 0.001

Co-primary Composite Outcomes
Death or Change in Physical Health Composite score

B  Death or Change in PHC Score

Hazard ratio, 0.70 (95% CI, 0.53–0.92)
P=0.007

Conventional hemodialysis

Frequent hemodialysis
### Main Secondary Outcomes

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Effect Measure</th>
<th>Estimated Standardized Effects (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LV mass</td>
<td>Mean decrease</td>
<td></td>
</tr>
<tr>
<td>Physical-health composite score</td>
<td>Mean increase</td>
<td></td>
</tr>
<tr>
<td>Beck Depression Inventory score</td>
<td>Mean decrease</td>
<td></td>
</tr>
<tr>
<td>Predialysis albumin</td>
<td>Mean increase</td>
<td></td>
</tr>
<tr>
<td>Predialysis phosphorus</td>
<td>Mean decrease</td>
<td></td>
</tr>
<tr>
<td>ESA dose</td>
<td>Mean decrease in log</td>
<td></td>
</tr>
<tr>
<td>Predialysis systolic blood pressure</td>
<td>Mean decrease</td>
<td></td>
</tr>
<tr>
<td>Trail Making Test Part B</td>
<td>Negative log relative risk</td>
<td></td>
</tr>
<tr>
<td>Death or hospitalization unrelated to vascular access</td>
<td>Negative log hazard ratio</td>
<td></td>
</tr>
</tbody>
</table>

Conclusions

- *Frequent hemodialysis, as compared with conventional hemodialysis, was associated with favorable results with respect to the composite outcomes of death or change in left ventricular mass and death or change in a physical-health composite score but prompted more frequent interventions related to vascular access.*
Common Barriers for Frequent Dialysis

- Lack of awareness of home options
- Patient misperceptions
- Staff misperceptions
- Financial barriers
Who Makes the Decision?

Joint or patient-led decision:
• 84% of new home dialysis patients
• 47% of new in-center HD patients

Medical team led decision:
• 53% of new in-center HD patients
• 16% of new home dialysis patients
Patient Misperceptions

- You need a professional to do hemodialysis
- I can’t do needle sticks
- Insurance won’t pay for more frequent dialysis
- More frequent hemodialysis burdens the patient and family more
Patient Misperceptions

In-Center Burdens

- No schedule control
- Travel to/from clinic
- Time off work/school
- No choice of stick-er
- Living w. symptoms
- Strict diet/fluid limits
- Other patient deaths
- Travel planning...
- Emergency worries

Frequent Home HD Burdens

- Order/store supplies
- Space for equipment
- Wiring/plumbing changes
- Putting in needles
- Doing treatments
- Alarms at night
- Troubleshooting
- Dialysis emergencies
Staff Misperceptions

• Professionals need to do HD
• Machines are too complex
• Patients are too:
  ① Old
  ② Uneducated
  ③ Non-technical
  ④ Unmotivated
• Liability risk is too high
How do we Overcome Hurdles

• Doctors and nurses need frequent hemo experience
• Clinics need examples of policies and procedures
• Staff/patients need frequent hemodialysis hemo mentors
Conclusions

• More intensive dialysis may improve ESRD patient outcomes

• Observational and RCT trials suggest better anemia care, phosphorus control, fluid and BP management with intensive HD

• Retrospective analysis shows improved survival with intensive dialysis