

Cost-Effectiveness of Interventions in Chronic Kidney Disease: A Literature-Based Review

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1. Background

- Better approaches to the management of CKD may offer the potential to slow the growth in ESRD costs, or may otherwise offer “value for money” in terms of improving clinical outcomes at a reasonable cost.
- Cost-effectiveness reviews, notably those focusing on potential strategies to both save money and improve CKD and ESRD care, are limited in nephrology.
- The purpose of this study was to assess potential cost-effectiveness across the range of interventions available for the CKD population.

2. Methods

- Terms for CKD/ESRD/dialysis, costs/cost analysis, and complications/comorbidities were used to search peer-reviewed English-language studies published in the last 10 years.
- We created league tables of cost-utility ratios and cost-effectiveness ratios with currencies converted to 2008 US dollars.
- Data on other disease types from the Tufts Cost-Effectiveness Analysis Registry were used to calculate the proportion of interventions that have been shown to be dominant (offering equivalent or better outcomes at lower cost) in 12 different areas.

3. Results

- Fifty studies evaluating interventions in CKD/ESRD provided 76 cost-utility ratios and 29 cost-effectiveness ratios (**Figure 1**).
- Based on cost-utilities, approximately 36% of the reviewed interventions were dominant over the comparator – higher than that found in any other major disease type (**Figure 2**).
- Cost-saving interventions included: Medicare first-dollar coverage of ACE inhibitors for diabetics; adjunctive benazepril; annual proteinuria screening in older diabetics; home nocturnal hemodialysis (HD) vs. in-center HD; and early referral to a multidisciplinary clinic.
- Dominant interventions fell into 4 broad categories (**Table 1**):
 - transplant-related interventions (33%)
 - Hypertension-related interventions (22%)
 - interventions related to dialysis (17%)
 - studies related to earlier referral to a nephrologist, more generous reimbursement, expanded screening, or other miscellaneous interventions (17%)

4. Results, cont.

Figure 1. Summary of cost-effectiveness and cost-utility ratios*

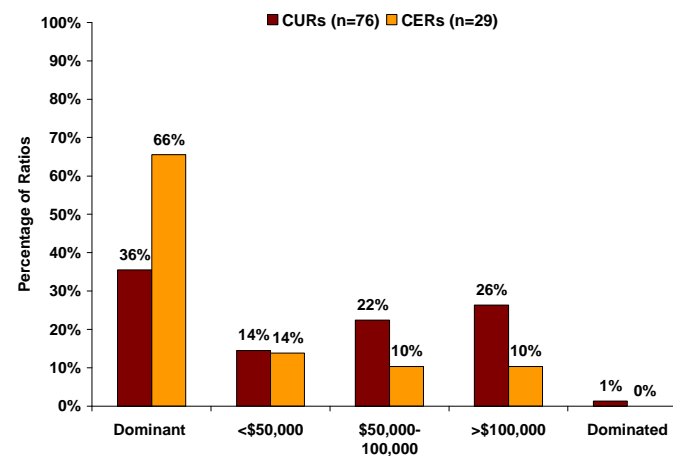
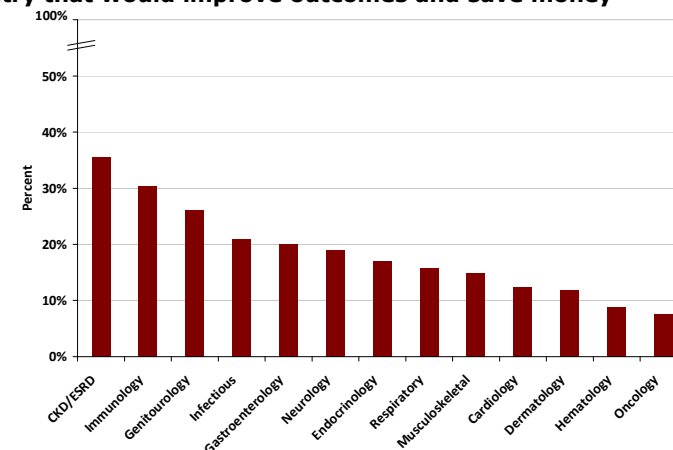


Figure 2. Percentage of interventions in 12 different disease areas in the Tufts CEA Registry that would improve outcomes and save money



5. Results, cont.

Table 1. Selected examples of dominant interventions*

Category	Description
Dialysis modality	Home HD VS. Hospital HD
	Nocturnal/daily HD VS. Conventional HD
	PD as initial modality VS. HD as initial modality
HTN	ACEI/ARB treatment (losartan/irbesartan/moxonidine/benazepril) VS. Conventional care
	Pharmacogenetic testing for the ACE I/D polymorphism (w/ selective treatment) VS. No testing, non-selective treatment
	Program to pay for ACEIs and Medicare first-dollar coverage of ACE inhibitors VS. Current practice
Misc.	Treatment with AST-120 (oral adsorbent) VS. Placebo
Referral	Early referral to a multidisciplinary clinic VS. Late referral
Screening	Annual screening for proteinuria/nephropathy VS. No screening
Transplant	Renal transplantation VS. Dialysis
	Siromulus VS. Cyclosporin/tacrolimus
	High-resolution flow cytometry cross-matching and solid-phase screening (FS) VS. Serological screening alone (SS)
	Removing human leukocyte antigen-B (HLA-B) matching from the deceased donor kidney allocation schema VS. HLA-B matching between donor and potential recipient of a kidney

6. Conclusions

- We found evidence that there may be opportunities to lower costs in the treatment of kidney disease patients while either improving or maintaining the quality of care.
- Most of the studies used in this analysis are post-hoc analyses and the primary studies on which they are based may have substantial limitations or questions of validity. While there are potential areas for policy interventions, further study is needed concerning some of the treatment approaches used to reduce costs.
- In addition, some of the interventions that have been reported to be cost-saving may be difficult to put into practice, requiring systematic implementation approaches and coordinated efforts.

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