

Cost-effectiveness and Budget Impact of Increasing Peritoneal Dialysis Utilization Among End-Stage Kidney Disease Patients in South Korea

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INTRODUCTION

- End-stage kidney disease (ESKD) imposes economic burdens on healthcare systems globally due to increasing patient populations and high treatment costs.
- In South Korea, hemodialysis (HD) accounts for >90% of dialysis treatments, while peritoneal dialysis (PD) use continues to decline.

OBJECTIVE

- To assess demographic trends, patient-level medical expenditures, and the budget impact of actively increasing PD utilization compared with maintaining current modality trends among ESKD patients in South Korea.

METHOD

- **Data source:** National Health Insurance claims for adults coded V001 (HD) or V003 (PD), 2018–2022.
- **Comparative analysis:** Propensity-score matching (PSM) to balance demographics and clinical variables; calculation of mean annual medical expenditure per patient.
- **Budget-impact model:** Projections under 2 scenarios (2023–33):
 1. **Status Quo:** continuation of observed modality trends
 2. **PD Activation:** implementation of Kidney Health Plan 2033 (KHP 2033) measures from 2025 to increase PD prevalence to **17% by 2033** (~+1.4% points annually), including financial incentives and facility subsidies.

RESULTS

- **Patient trends (2018–2022):** HD patients +23.0% (annual growth rate [AGR] +6.8%); PD patients –8.5% (AGR –1.6%).
- **Cost comparison:** Mean annual expenditure per patient was ~1.4× higher for HD than PD; the gap persisted after PSM and was consistent across age and diabetes subgroups.
- **Status-quo projection (2023–33):** Continuing current trends reduces PD share by 2.4% points by 2033, with total dialysis costs increasing from USD 1.997 billion (2023) to USD 4.432 billion (2033) (Table 1).
- **PD-activation projection (KHP2033):** Reaching 17% PD limits total costs to USD 4.245 billion in 2033 (savings USD 188 million that year; cumulative USD 770 million, 2025–2033) (Table 2).

Table 1. Budget impact analysis for dialysis patients (Status Quo)

(*USD per patient, **million USD total)

Number of patients	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
HD	88,755	94,828	101,316	108,249	115,655	123,569	132,024	141,057	150,709	161,021	172,039
PD	5,017	4,939	4,862	4,786	4,711	4,638	4,565	4,494	4,424	4,355	4,287
Total	93,772	99,767	106,178	113,035	120,367	128,207	136,589	145,552	155,133	165,376	176,325
PD %	5.4%	5.0%	4.6%	4.2%	3.9%	3.6%	3.3%	3.1%	2.9%	2.6%	2.4%
Annual medical expenses per person*	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
HD	21,595	21,941	22,292	22,648	23,010	23,378	23,752	24,132	24,517	24,910	25,308
PD	15,952	16,170	16,391	16,615	16,842	17,072	17,304	17,541	17,780	18,023	18,269
HD - PD	5,643	5,771	5,901	6,033	6,168	6,306	6,447	6,590	6,737	6,886	7,038
National total medical expenses**	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
HD	1,917	2,081	2,259	2,452	2,661	2,889	3,136	3,404	3,695	4,011	4,354
PD	80	80	80	80	79	79	79	79	79	78	78
Total	1,997	2,160	2,338	2,531	2,741	2,968	3,215	3,483	3,774	4,089	4,432

Table 2. Budget impact analysis after PD activation (KHP 2033)

(**million USD total)

Number of patients	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
HD	88,755	94,828	99,435	104,274	109,352	114,680	120,266	126,119	132,250	138,667	145,379
PD	5,017	4,939	6,743	8,761	11,014	13,527	16,323	19,432	22,883	26,709	30,946
Total	93,772	99,767	106,178	113,035	120,367	128,207	136,589	145,552	155,133	165,376	176,325
PD %	5.4%	5.0%	6.4%	7.8%	9.2%	10.6%	12.0%	13.4%	14.8%	16.2%	17.6%
National total medical expenses**	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
HD	1,917	2,081	2,217	2,362	2,516	2,681	2,857	3,043	3,242	3,454	3,679
PD	11	80	111	146	185	231	282	341	407	481	565
Total	1,997	2,160	2,327	2,507	2,702	2,912	3,139	3,384	3,649	3,936	4,245
Difference in medical expenses after PD activation	-	-	-11	-24	-39	-56	-76	-98	-124	-154	-188

Per-patient expenses in USD; national totals in million USD.

PD Activation targets 17% PD by 2033 (~+1.4% points annually) via KHP 2033 incentives and facility subsidies.

CONCLUSIONS

- **Increasing PD utilization** is associated with **substantial reductions** in healthcare spending and productivity losses, yielding meaningful **socioeconomic benefits**.
- **Urgent policy interventions** that address clinical, logistical, and non-economic barriers to PD adoption are warranted to maintain PD sustainability and optimize dialysis strategies in Korea.

REFERENCES

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CONTACT INFORMATION

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