Cost-Effectiveness of Silver-Containing Dressings in Patients with Diabetic Foot Ulcers in Korea

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Objectives

- Silver-containing dressings are known to improve complete healing rates when used appropriately in the treatment of diabetic foot ulcers.
- However, their use in Korean medical institutions is limited because they are not reimbursed by the National Health Insurance Service (NHIS).
- This study aimed to estimate and compare the cost-effectiveness of silver-containing dressings with standard dressing therapies eligible for NHIS reimbursement for the treatment of diabetic foot ulcers in Korea.

Methods

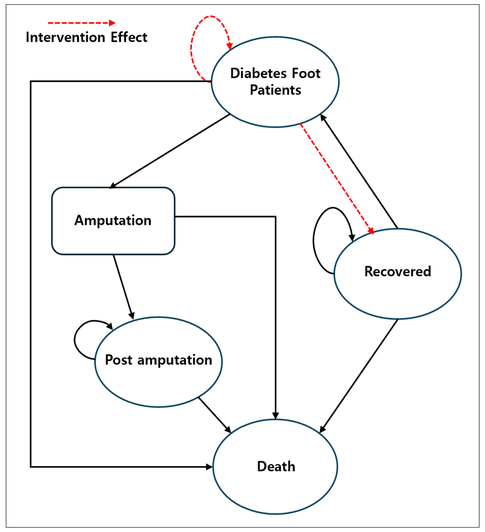
- **Study Design**
  - Model: Markov cohort model
  - Cycle / Horizon: 3 months / 5 years
  - Population: Newly diagnosed DFU patients in their 60s
  - Perspective: Healthcare system (payer + patient share)
  - Discount rate: 4.5% per year
  - WTP threshold: KRW 20 million / QALY

- **Comparators**
  - Intervention: Silver-containing dressing
  - SOC: Gauze : Foam : Cutimed® Sorbact® = 35 : 35 : 30

- **Data Sources**
  - Transition probabilities & disease costs
    - Korean National Health Insurance Service (KNHIS) claims data (2021~2024)
  - Dressing & procedure costs — HIRA fee schedule
  - Utilities — KNHANES 2020 + published literature

- **Analyses**
  - **Base case**: 5×5 cm | **Alternative**: 10×10 cm
  - **One-way sensitivity** (±10%) + **threshold analysis** on RR
  - **Budget impact**: 2023 nationwide (115,249 DFU patients, 709,136 dressings)

Figure 1. Markov model structure



Discussion & Conclusions

- Silver-containing dressing was dominant for DFU treatment in Korea - cost-saving and QALY-gaining even under conservative assumptions (RR = 1.20 vs. meta-analysis 1.28).
- Result was highly robust, remaining cost-effective down to RR = 1.02 under ±10% sensitivity analysis.
- Findings support expanding National Health Insurance coverage of silver dressings beyond burns to chronic wounds including DFU.

Results

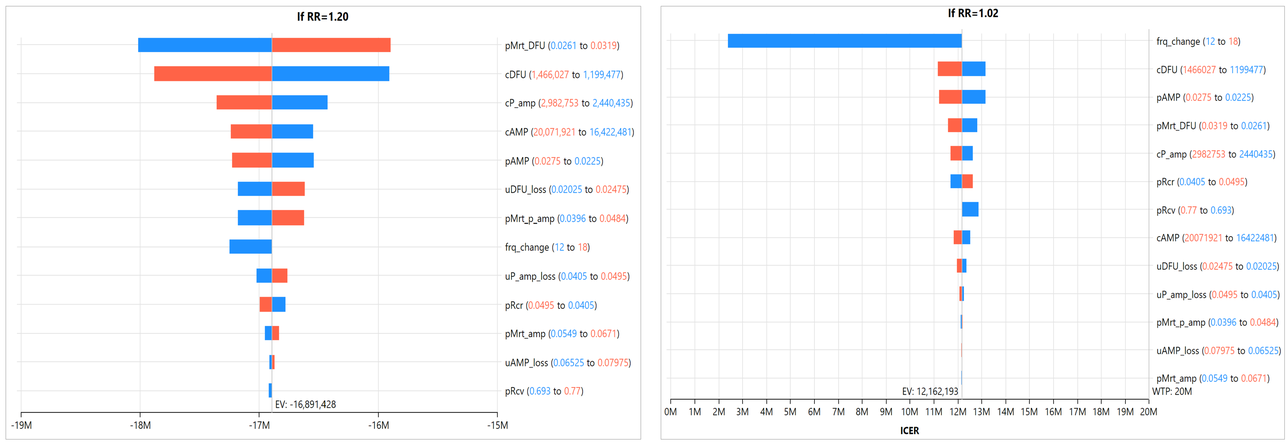
- **Projected Clinical Impact**
  - Based on 2023 claims data, ~25,000 patients in their 60s were newly diagnosed with DFU annually.
    - Applied to the 2023 cohort, silver dressing use could prevent 183 amputations and 288 deaths, and shorten DFU treatment duration by 0.89 months per patient

Table 1. Cost-effectiveness analysis results

Strategy	No. of months in DFU treatment	Cost per Person (KRW)						QALYs per Person	Saved QALYs	ICER (10,000 KRW/QALY)
		Intervention Cost (A)	Excess intervention cost (B)	Cost of Illness (C)	Saved cost of illness (D)	Total Cost (A+C)	Incremental Cost (B-D)			
Assuming small (5 × 5 cm) dressing size (base-case scenario)										
Silver-containing dressing	5.37	585,175	40,183	3,986,123	657,058	4,571,298	- 616,875	3.5284	0.0365	Dominant
Standard of care*	6.27	544,992	NA	4,643,181	NA	5,188,173	NA	3.4919	NA	NA
Assuming large (10 × 10 cm) dressing size										
Silver-containing dressing	5.37	1,122,764	524,514	3,986,123	657,058	5,108,887	- 132,544	3.5284	0.0365	Dominant
Standard of care*	6.27	598,250	NA	4,643,181	NA	5,241,431	NA	3.4919	NA	NA

- Silver dressing was dominant in both dressing-size scenarios: lower total cost and higher QALYs than SOC (Table 1).
- Disease-related costs decreased by ~KRW 660,000 per person over 5 years in both scenarios
- Per-cycle dressing cost difference was ~KRW 70,000 (5×5 cm), but 5-year cumulative dressing cost difference was only ~KRW 40,000 - longer SOC treatment duration offsets silver dressing's higher unit price
- QALY gain: +0.0365 per person (from prevented amputations, deaths, and shorter treatment)

Figure 2. One-Way Sensitivity Analysis (Tornado Diagram)



- **Threshold analysis on RR (effectiveness of silver vs. SOC)**
  - 5×5 cm: Cost-effective down to RR = 1.02 at WTP KRW 20M/QALY
  - 10×10 cm: Cost-effective down to RR = 1.07

- **Other input parameters (±10%)**
  - Silver dressing remained dominant across all variations
  - Under the most conservative scenario (RR = 1.02), ICER changed by at most KRW 1.2 million with ±10% variation in other inputs -> result is highly robust

Table 2. Budget Impact of Silver Dressing Reimbursement (Healthcare System Perspective)

Silver replacement (5×5 cm)	Additional budget / year	Offset by clinical savings
30%	+KRW 1.23 billion	Per-patient: KRW 620K / 5yr
50%	+KRW 1.39 billion	National: KRW 62B / 5yr (≈1% of DM cost)

- **Budget Impact Analysis**
  - Additional dressing expenditure is substantially offset by reduced disease-related costs. Expanding silver dressing reimbursement is fiscally sustainable for the Korean NHI system.