

Reference

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The Kenevo microprocessor-controlled prosthetic knees in individuals older than 65 years in Sweden: A cost-effectiveness and budget-impact analysis

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Products

Kenevo

Major Findings

With Kenevo compared to non-microprocessor-controlled knees (NMPKs) in the simulation:

→ **Kenevo reduces the frequency of fatal falls by approximately 63 %**

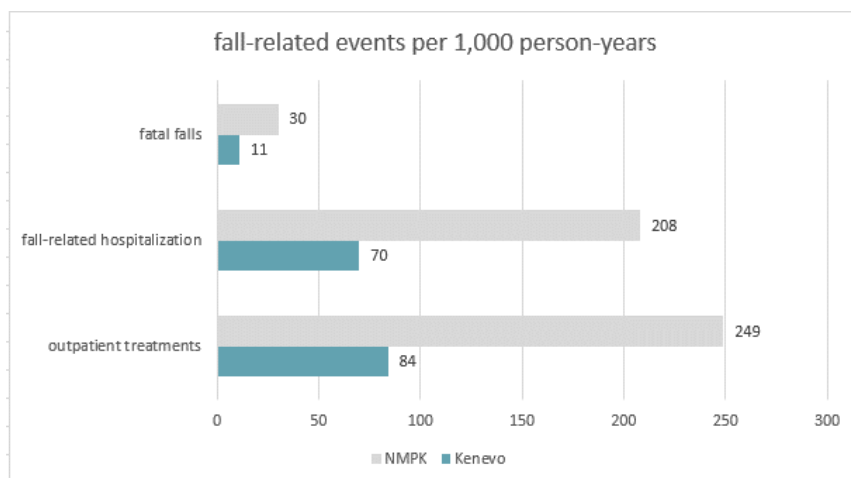
Reduction frequency of fatal falls by 19 per 1,000 person years (PY)

→ **Kenevo reduces the frequency of fall-related hospitalizations by about 66 %**

Reduction of the frequency of hospitalizations by 137 per 1,000 PY

→ **Kenevo reduces the rate of outpatient treatments by approximately 66 %**

Reduction of the frequency of outpatient treatments by 165 per 1,000 PY

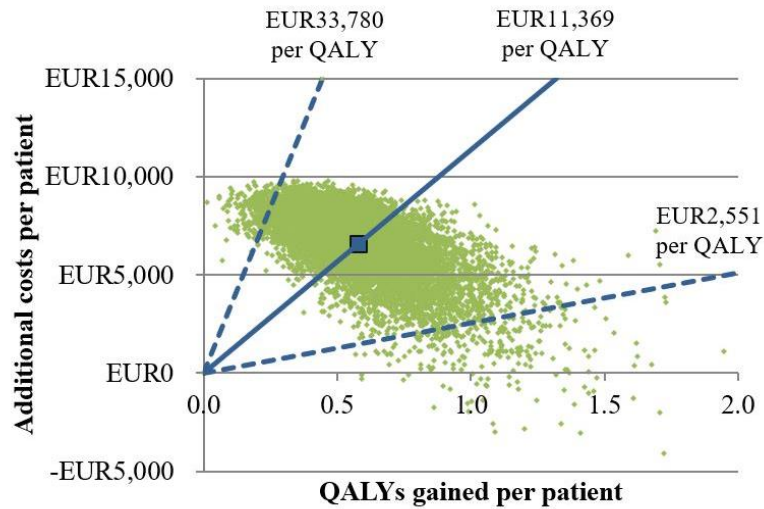


→ **The use of Kenevo results in 0.58 Quality-adjusted life years (QALYs) gained per patient.**

Despite low life expectancy in older and low-functioning individuals using a Kenevo which may reduce the expected useful life of the MPK and limit potential benefits which accumulate over time, cost-effectiveness was shown.

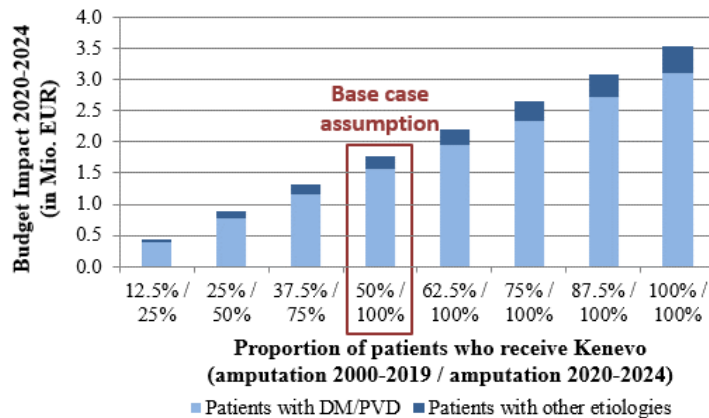
Kenevo is a likely cost-effective device from the payer perspective: over a time-horizon of 25 years, the incremental cost-effectiveness ratio (ICER) was 11,369 Euros per quality-adjusted life years gained (QALY):

Base case and probabilistic sensitive analysis



Over the period of 5 years (2020-2024), the budget impact model predicted an increase in payer expenditure of EUR1.76 million if all new patients received a Kenevo/MPK, and 50% of current NMPK users switched to the MPK.

Budget impact of Kenevo for different penetration rates



→ Kenevo Budget Impact Analysis over 5 years for different penetration rates. In the penetration rates, a distinction was made between patients with TFA/KD before 2020 and fitted with a NMPK as well as patients who were fitted with prosthesis for the first time from 2020. In the former, it was assumed that a prosthesis revision would allow the patient to switch from an NMPK to a Kenevo.

Population

Subjects:	elderly individuals living with TFA or KD in Sweden (ICD-10/DRG statistics National Board of Health and Welfare)
Previous prosthesis:	no prosthesis
Amputation etiologies:	Diabetes mellitus (DM) and/or peripheral vascular disease (PVD) or other etiologies
Age:	65+ years, stratified 65-74, 75-84, 85+
Mean time since amputation:	alive 6 months after surgery
MFCL:	not stated, Kenevo use indicated

Study Design

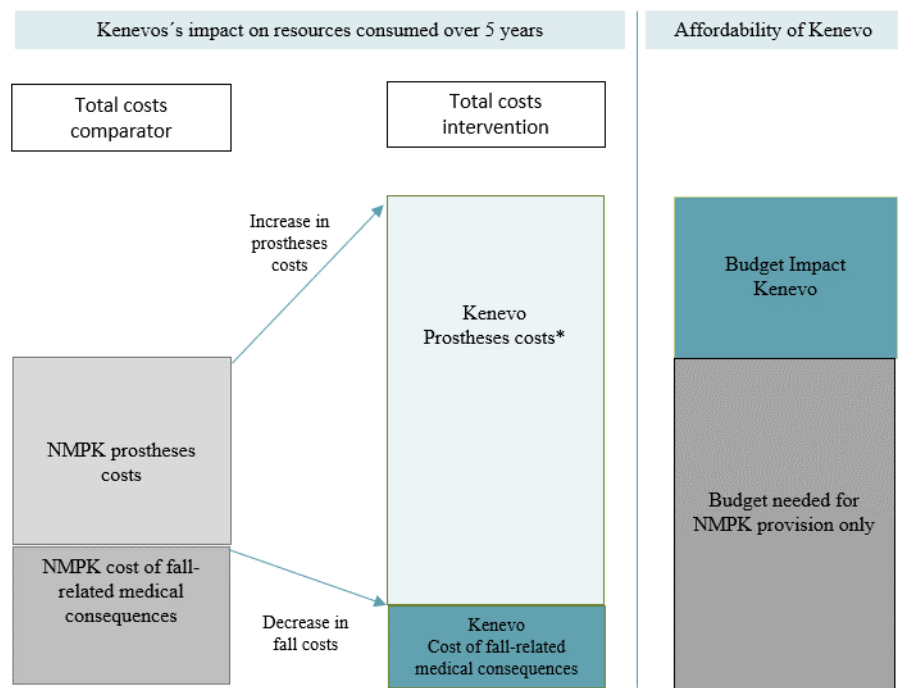
Decision-analytic model

A decision-analytic model was used to perform a **cost-effectiveness analysis** over a time horizon of **25 years** from the **payer perspective** (statutory health insurance).

Direct health care costs for hospital / outpatient treatments of fall-related injuries were determined for common fall injury types (e.g., hip, femur, wrist, and shoulder fractures) based on Swedish DRGs. After assigning the DRG prices, the average costs of hospitalization (7,475 €) and outpatient treatment (626 €) could be calculated. Fatal fall costs were assumed to be the costs of hospital treatments*1.1.



Furthermore, this model was used to perform a **budget impact analysis** over a time horizon of **5 years**.



*Including 3 years warranty package + optional 3 year add-on warranty package

°Including NMPK replacement

Results

Functions and Activities						Participation			Environment
Level walking	Stairs	Ramps, Hills	Uneven ground, Obstacles	Cognitive demand	Metabolic Energy Consumption	Safety	Activity, Mobility, ADLs	Preference, Satisfaction, QoL	Health Economics

Category	Outcomes	Results for Kenevo compared to NMPKs	Sig.*	
Cost-effectiveness analysis (discounted by 3%)	Utility	Kenevo NMPK	0.704 0.626	n.a.
	QALY gained	Kenevo user	0.58	n.a.
	ICER (in Euros)	65+	11,329 €	n.a.
		65+ DM/PVD:	11,769 €	
		64-74 DM/PVD:	10,367 €	
		85+ DM/PVD:	15,000 €	
		65+ o. etiologies:	9,043 €	
		64-74 o.e.:	7,504 €	
		85+ o.e.:	14,345 €	
	Probabilistic sensitivity analysis (PSA)	At an ICER threshold of - 40,000 Euros/ QALY gained, probabilities that Kenevo is cost-effective was 99% - 8,000 Euros/ QALY gained, probabilities that Kenevo is cost-effective was 23 %		n.a.
PSA ICER ranges	Q _{0.025} –Q _{0.975} intervals:	2,551 € to 33,780 €	n.a.	
Univariate and multivariate sensitivity analysis	Input parameters with highest impact on cost-effectiveness are: - Effects of falling - Proportion of medical falls - Kenevo price		n.a.	
Budget impact analysis	Switch of all former NMPK user to Kenevo	Budget impact increases to approximately 3.53 million Euros	n.a.	
	Probabilistic sensitivity analysis	Q _{0.025} –Q _{0.975} intervals: 0.68 to 2.54 million Euros	n.a. n.a.	
	Univariate and multivariate sensitivity analysis	Input parameters with highest impact on the budget impact are: - Effects of falling - Proportion of medical falls - Mean usage duration NMPK	n.a.	

* no difference (0), positive trend (+), negative trend (-), significant (++)/(--), not applicable (n.a.)

Author's Conclusion

"The results of our modeling study indicate that the Kenevo knee, by reducing the falling risk, is likely to be cost-effective in individuals older than 65 years in a Swedish context, and therefore, a revision of current prescription routines might be warranted." (Kuhlmann et.al, 2022)

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