Impact of phacoemulsification equipment in surgical throughput, under the perspective of a Greek hospital.

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Background Results • Increased cost of healthcare is a common challenge which most countries face¹. Table 3. Annual results Capacity constrains are also a common issue, potentially leading to prolonged waiting lists. The Greek government strives to ensure universal coverage and equitable access, focusing on cost containment policies and increased Table 3. Annual results

- efficiencies².
- Cataract surgery is one of the most frequent surgical procedures at country level and phacoemulsification is the preferred technique.
- Aging population, among with other possible risk factors for age-related cataract³, result in an increasing prevalence of cataract in Greece.
- The objective of this analysis is to estimate the economic impact and efficiency of different phacoemulsification equipment, under the perspective of a Greek hospital.

Methods

Decision Analytic Model

- A decision-analytic model was developed in Excel to estimate the aggregated impact on cataract surgery throughput of different phacoemulsification equipment features.
- Two alternative scenarios were compared (see table 1), considering phacoemulsification equipment with the following variables: torsional vs.

- Savings in OR time, accounted for 11.1% efficiency increase for the cataract procedure time between the two scenarios of the analysis.
- Considering OR costs, that could translate into a difference of €63,611 annually (the time saved would be equivalent of up to 222 additional cataract procedures)

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Figure 1. OR costs for a Greek hospital (N=2,000), related to cataract surgery



Iongitudinal ultrasound movement, Active Sentry[™] vs. other-handpiece, active fluidics vs. gravity-based infusion system, and Intrepid® balanced tip vs. Kelman phaco-tip.

- Operating Room (OR) time was chosen as the key variable of efficiency.
- Inputs were derived from a target literature review and expert opinion.
- The model assumed a hospital performing 2,000 cataract procedures per-annum (grade 3 and 4 cataracts), with 100% adoption and equal acquisition costs for each one of the two scenarios.
- The model and underlying assumptions were validated by clinical experts.

Efficiency increase in cataract procedure

 Table 1. Savings in OR time (seconds)

Feature	Technology		OR time	Poforonco
	Scenario 1	Scenario 2	dif. in sec	Reference
Ultrasound movement	Torsional	Longitudinal	62.00	Christakis 2012 ⁴
Handpiece	Active Sentry	Other-handpiece	12.10	Jirásková 2021⁵
Infusion system	Active fluidics	Gravity-based	41.71	Malik et al. 20176
Phaco-tip	"Intrepid" balanced tip	Kelman phaco- tip	17.64	Malik et al. 2017 ⁶

*OR costs for scenarios 1 & 2 are estimated by multiplying the number of minutes devoted to performing 2,000 cataract procedures, by the OR cost per minute.

Conclusions

- This analysis highlights the relevance of phacoemulsification features such as ultrasound movement, handpiece, infusion system and phaco-tip, with the aim to achieve an efficient throughput for cataract surgery, with subsequent hospital costsavings, and/or efficiency gains which could lead towards more productive ORs, potentially reducing waiting lists.
- Further research would be needed, to better estimate the contribution of phacoemulsification equipment for efficient cataract surgeries.

References and Disclosures

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Other inputs

Table 2. Other inputs and assumptions

Input	Reference/Source	
Cataract procedure - Average time, including patient turnaround (minutes)	20	Roberts et al. 2018 ⁷
# Grade 3 & 4 cataract procedures per annum	2,000	Model assumption
Cost of 1 minute of OR time in Euro	€ 14.30	Greek DRG ⁸ adjusted

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