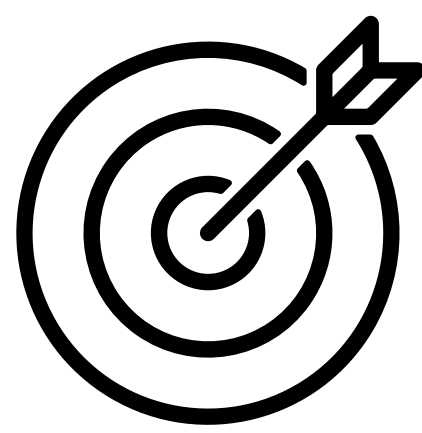


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Rationale of the study and objective

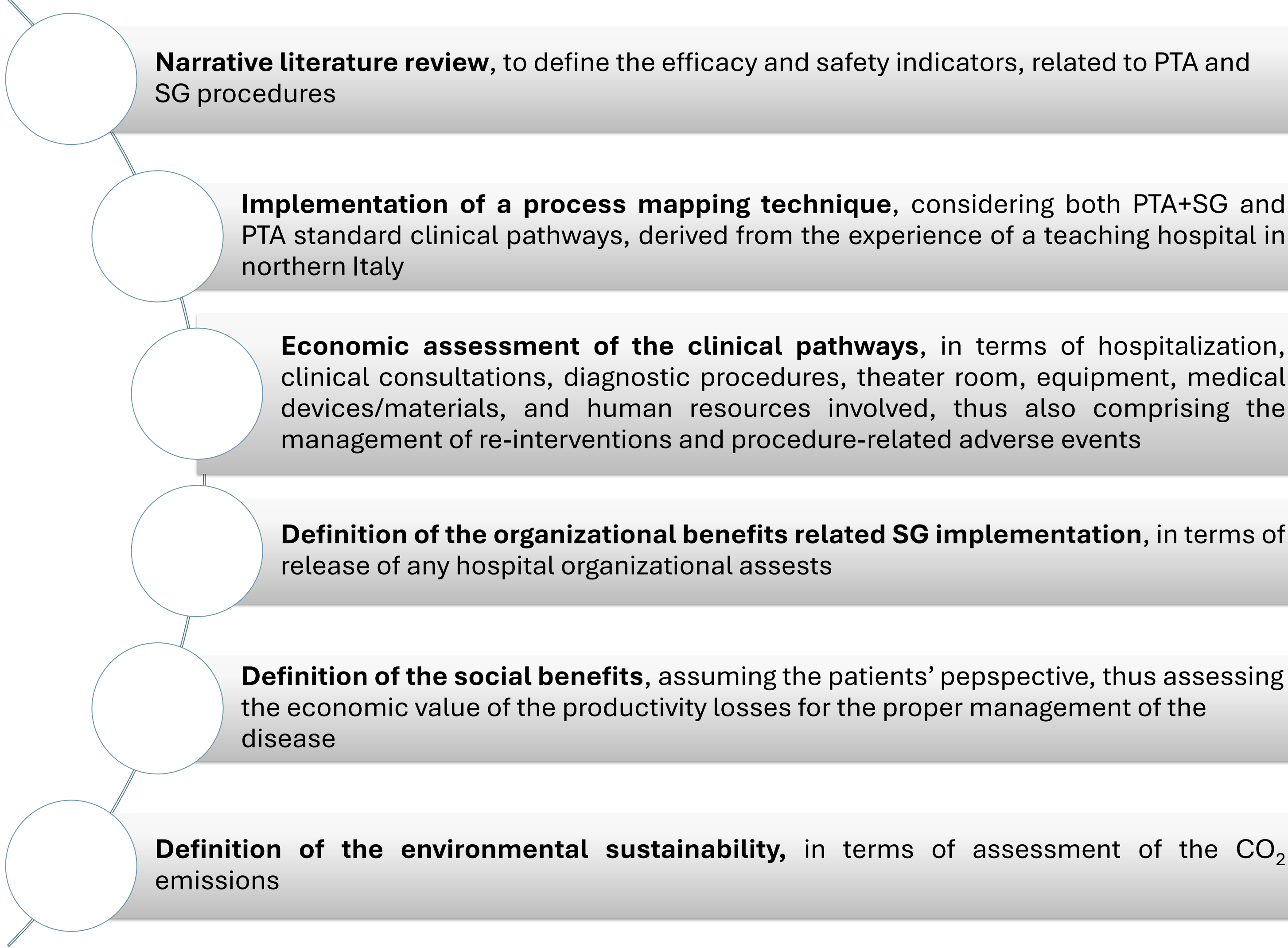
- ❖ Maintaining vascular access is critical for providing treatment for patient with chronic kidney disease, requiring hemodialysis
- ❖ However, patients may experience episodes of fistula maturation failure, resulting in increased use of the central venous catheters, thus leading to an increase in the patients’ management costs
- ❖ In this setting, percutaneous transluminal angioplasty (PTA) of the underlying lesion may be considered, even if this procedure results in poor long-term primary patency, particularly when circuits are thrombosed
- ❖ As such, Stent Grafts (SGs) have emerged as a supplemental approach to PTA, presenting a higher efficacy and safety profile: SG implementation could significantly reduce the number of re-interventions for all patients, especially for those who had thrombosed grafts (Vesely et al., 2016; Mohr et al., 2019)
- ❖ **Despite the advantages related to SGs, their implementation is not standardized yet within the clinical practice, because of their greater acquisition costs, as well as because of the learning curve required for the healthcare professionals involved**



To analyze the multi-dimensional impacts related to the implementation of stent graft (SG), in comparison with percutaneous transluminal angioplasty (PTA), for the management of patients with chronic kidney disease, requiring hemodialysis

Methods

An impact assessment analysis was conducted, focusing on the definition of SG economic, organizational, social, and environmental sustainability, assuming a 12-month time-horizon



Results

Economic
results

Over a 12-month time-horizon, preliminary results reported a total cost per patient of 7,665.42€ for PTA alone and 13,740.56€ for PTA+SG, given the higher medical device acquisition cost

Phase	PTA	PTA+SG	Difference	Difference %
Surgery and follow-up	1,952.96 €	6,022.88 €	4,069.92 €	208.4%
Adverse events	2,197.14 €	1,694.81 €	-502.33 €	-22.9%
Re-intervention	3,515.32 €	6,022.88 €	2,507.56 €	71.3%
Total costs	7,665.42 €	13,740.56 €	6,075.15 €	79.3%

The economic assessment revealed the **cost-effectiveness nature of PTA+SG**, with an **overall probability equal to 66% to be able to optimize the overall patients’ pathway and guarantee a higher efficacy** (measured as Target Lesion Primary Patency=30.2% *versus* 18.2%)

Organizational
results

From an organizational perspective, SG would generate a reduction in the overall hospital accesses devoted to the management of adverse events and/or complications, in terms of inpatient days freed up (-20%) and outpatients’ procedures (-44%)

Organizational analysis	PTA	PTA+SG	Difference %
Average minutes per outpatient, for the treatment of adverse events and re-intervention	691.2	385.2	-44%
Average length of stay, for the adverse events treatment and re-intervention	3.42	2.75	-20%

Social and
environmental
results

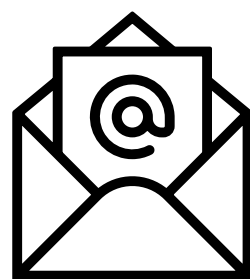
The decrease in the number of re-interventions and complications would also result in a lower patients’ productivity loss (-31%), with a consequent environmental advantage given a reduction in CO2 emission (-38%)

Social analysis	PTA	PTA+SG	Difference (Euro)	Difference (%)
Social costs for outpatient activities (productivity loss + transportation costs)	257,69 €	144,51 €	-113,18 €	-44%
Social costs for inpatient activities (productivity loss + transportation costs)	449,05 €	341,53 €	-107,52 €	-24%
Total costs	706,74 €	486,04 €	-220,70 €	-31%

Environmental analysis	PTA	PTA+SG	Difference (gr di CO ₂)	Difference (%)
CO ₂ emission for outpatient activities	21,470	12,167	-9,304	-43%
CO ₂ emission for inpatient activities	66,797	42,702	-24,095	-36%
Total CO ₂ emission	88,267	54,869	-33,398	-38%

Conclusions

- ❖ From an efficacy point of view, literature demonstrates the superiority of using SG *versus* PTA in terms of TLPP of 30.2% in case of PTA+SG (versus 18.2% of PTA, p-value = 0.008 - Vesely et al., 2016)
- ❖ Besides the evidence-based effectiveness, preliminary results revealed the potentialities of SG in guaranteeing the economic, organizational, social and environmental sustainability over a 12-month time horizon
- ❖ However, to better appreciate SG implementation advantages, final results would assess the patients’ clinical pathway over a long-term time horizon, collecting real-life data based on administrative flow derived from the management control of the Italian hospital involved



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