

# Radiofrequency-Based Renal Denervation For Treatment-Resistant Hypertension in Italy: A Budget Impact Analysis

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## BACKGROUND

- Blood pressure (BP) reduction in uncontrolled hypertension is associated with reduced risk for cerebro-cardiovascular (CV) events and end-stage renal-disease (ESRD).
- The safety and efficacy of radiofrequency-based renal denervation (RDN) to reduce BP has been demonstrated.<sup>1-3</sup>
- One target population is “treatment resistant” hypertension (trHTN, defined as uncontrolled BP despite attempt of ≥3 antihypertensive drugs).

## OBJECTIVE

Evaluate the **economic impact of RDN** in trHTN from the Italian healthcare perspective, considering the potential **economic benefits through avoidance of CV events and ESRD**.

References:

- 1- Böhm, M. et al. SPYRAL HTN-OFF MED Pivotal RCT; Lancet 395, 1444–1451 (2020).
- 2- Kandzari, D. E. et al. SPYRAL HTN-ON MED proof-of-concept RCT. Lancet 391, 2346-2355 (2018).
- 3- Mahfoud, F. et al. Global Symplcity Registry. J. Am. Coll. Cardiol. 75, 2879–2888 (2020).

## METHODS

- A budget impact model with 10-year time horizon.
- Comparison of scenarios with and without RDN (with presumed progressive adoption up to 8%).
- Two scenarios for RDN BP reductions (office SBP): -6.8mmHg (SPYRAL HTN-ON MED pilot study<sup>2</sup>) and -21.6mmHg (Global SYMPLICITY Registry<sup>3</sup>).
- CV events (Myocardial Infarction, Stroke, Heart Failure) and ESRD were estimated from multivariate risk equations; reductions for RDN were modelled from published meta-regression analyses.
- Costs of hypertension-related events and treatment were identified through a literature review; the Italian DRG tariff was used as a proxy for the procedure cost of RDN.

## RESULTS and CONCLUSIONS

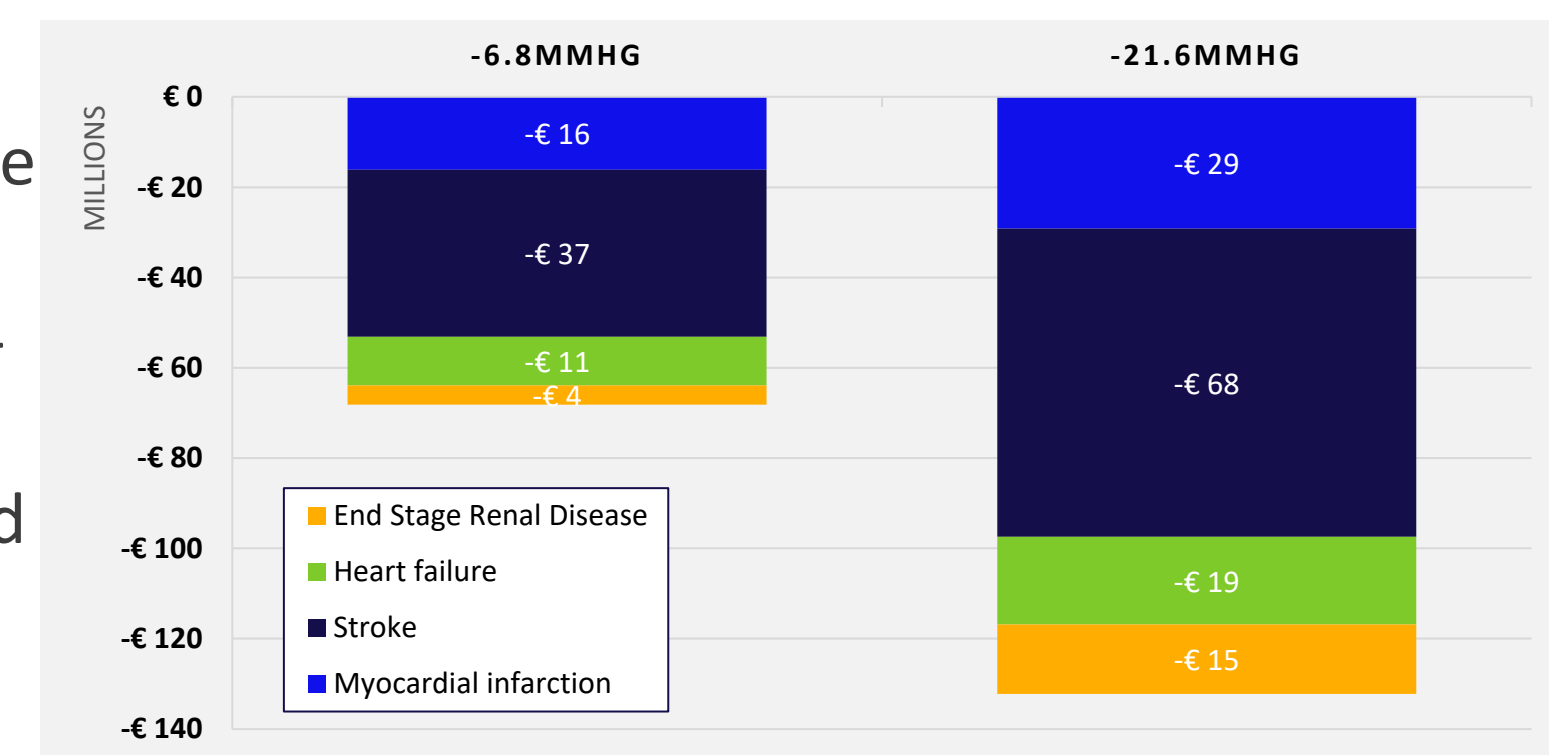
1. Increasing RDN use over 10 years would lead to reduction of CV events and ESRD (see table). Mortality would be reduced by 7-14%.

Events Avoided with RDN for Two BP Scenarios

Events Avoided	3 Years	10 Years
Myocardial infarction	10-18	3'151-5'691
Stroke	14-26	6'068-11'165
Heart failure	11-20	3'857-6'985
End Stage Renal Disease	0-1	29-154
<b>Total</b>	<b>35-65</b>	<b>13'106-23'995</b>

2. These reductions would translate to economic benefits of 68-132 Mio€ in events-avoided costs:

Savings over 10 years for Events Avoided, for Two BP Effect Size Scenarios



3. Overall, considering the upfront procedural costs, the RDN scenario would lead to an additional budget impact to the health care system, representing 1.4-2.3% of the total 10-year budget for treating trHTN. The annual per patient incremental cost would be 65-110€.

**Conclusions: Increasing adoption of RDN would allow the avoidance of CV & ESRD morbidity & mortality, with an estimated impact on the NHS budget for trHTN patients of up to 2.3% in Italy.**