



**Federaal Kenniscentrum
voor de gezondheidszorg
Centre fédéral d'expertise
des soins de santé**



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HTA - Hadrontherapy

KCE reports 67A

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www.kce.fgov.be

Methodology

- Questionnaire to centres
- Phone recalls follow-up

Results

	Yearly capacity for Belgian patients	Price range
Uveal centres	75 - 100	3.4 – 20 k€
Other Proton - centres	Up to 500	15 - 34 k€
Carbon ion – centres	Up to 500	20 - 40 k€



Sufficient capacity for all eligible Belgian patients (~51)



Cost of a Belgian hadron centre

Base Case centre characteristics

C-ion + P

3 treatment rooms

Infrastructure cost: 116,3 m€

Maintenance price:

- 7,27% equipment

- 3% building

Break-even point after 20 years operation

Hospital subsidy 60%

Working hours

- 12,5 hrs/day

- 5 days/week

90% utilization of rooms

18 fractions per patient

Investment cost

m €

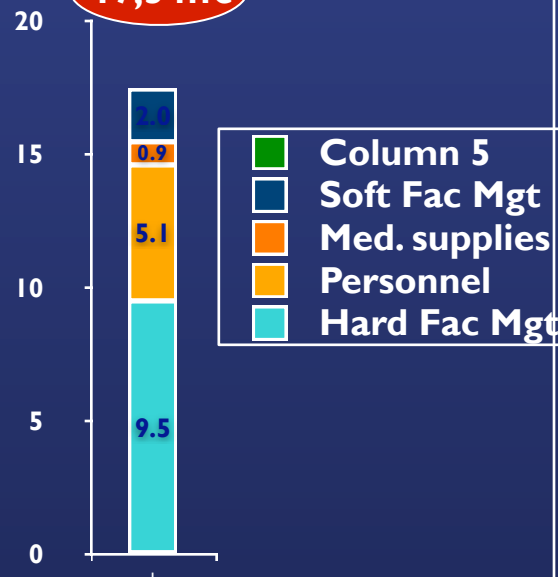
159,6 m€



Operational cost

m €

17,5 m€



- 900 patients yearly
- 6,2 m€ subsidies (20 years)
- RIZIV/INAMI reimbursement 22,2 m€



Results

	Base Case Scenario	Sensitivity Scenarios	Impact of Sensitivity			
			N° pat.	Yearly subs.	RIZIV/INAMI yearly cost	RIZIV/INAMI avg cost per pat.
		Base Case Results	900	6,2 m€	22,2 m€	24,7 k€
Treatment type	C-ion + P	P only	-2%	-33%	-24%	-23%
N° treatment rooms	3	2	-33%	-11%	-14%	+28%
		4	+33%	+10%	+14%	-14%
Working hours	12,5 hrs/day	15 hrs/day; 6 days/week	+44%	-	+10%	-24%
	5 days/week	8 hrs/day, 6 days/week	-23%	-	-4%	+26%
% utilization of rooms	90%	95%	+6%	-	-	-5%
		75%	-6%	-	-	+6%
Number of fractions per patient	18 fractions	16 fractions	+13%	-	-	-11%
		20 fractions	-10%	-	-	+11%
Financing: break-even point	Break-even after 20 years operation	B-E after 25 years	-	-	-5%	-4%
		B-E after 15 years	-	-	+6%	+6%
Financing: subsidy %	60%	50% subsidy	-	-16%	+5%	+5%
		10% subsidy	-	-84%	+26%	+26%
Investment price	116,3 m€	10% reduction in price	-	-10%	-6%	-6%
		10% increase in price	-	+10%	+6%	+6%
Maintenance price	7,27% equipment	20% reduction in price	-	-	-9%	-9%
	3% building	10% increase in price	-	-	+5%	+4%

Conclusions and recommendations

- **Poor evidence in favour of Proton therapy :**
Only 2 modest studies even though > 50 000 patients treated
 - **No single RCT yet for Carbon-ion therapy**
Even though > 3 500 patients treated
- **Only few (51) patients could today benefit from hadron therapy**
- **In the short term, from EBM point of view, an investment in a Belgian centre (159 m€) can not be justified**
 - **Agreements with foreign centres are therefore recommended**
 - **Still, in order to stimulate biomedical research & innovation, qualified Authorities should consider an investment in this promising technology**

Comparison of the lateral scattering of photon, proton and carbon beams as function of the penetration depth

Broadening of the beam (mm)

