

THE EXPECTED HEALTH ECONOMIC VALUE OF USING CIRCULATING TUMOR CELLS TO PERSONALIZE CANCER TREATMENT

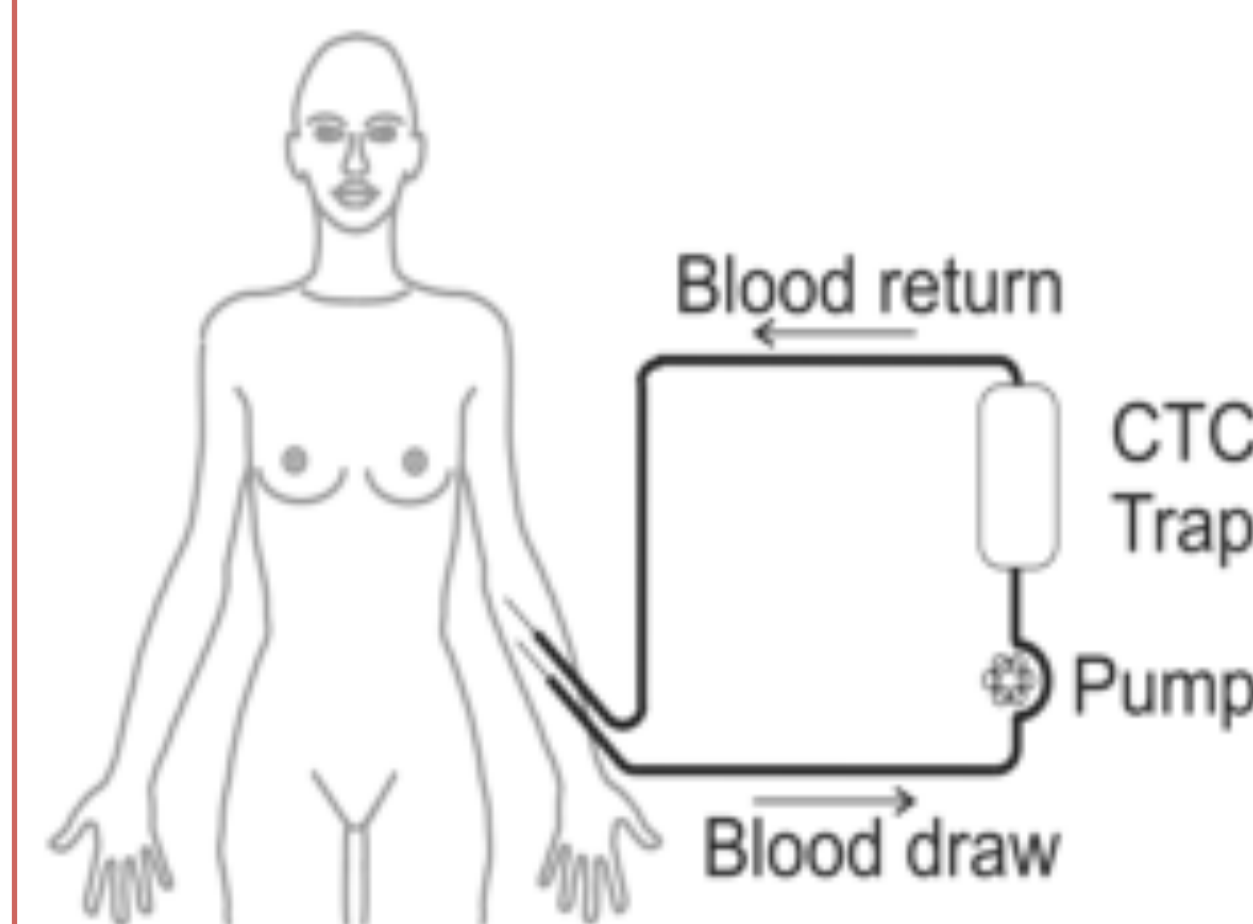
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OBJECTIVES

Circulating tumor cells (CTCs) in the blood can give valuable information about the prognosis and treatment options in oncology. A new device, CTC therapeutic apheresis (CTC trap) is being developed to collect CTC from (whole) peripheral blood in cancer patients. The primary goal of this study is to estimate the most appropriate use and implementation site of the CTC in the care pathway.

METHODS

Consulting guidelines and experts' interviews were used to document the diagnostic track in breast cancer. Systematic literature study is performed to identify possible implementation options. Early assessment of health economic benefit (cost-effectiveness gap analysis) and patient flow analysis are used to estimate the health economic impact of implementing CTC trap at the identified implementation options.

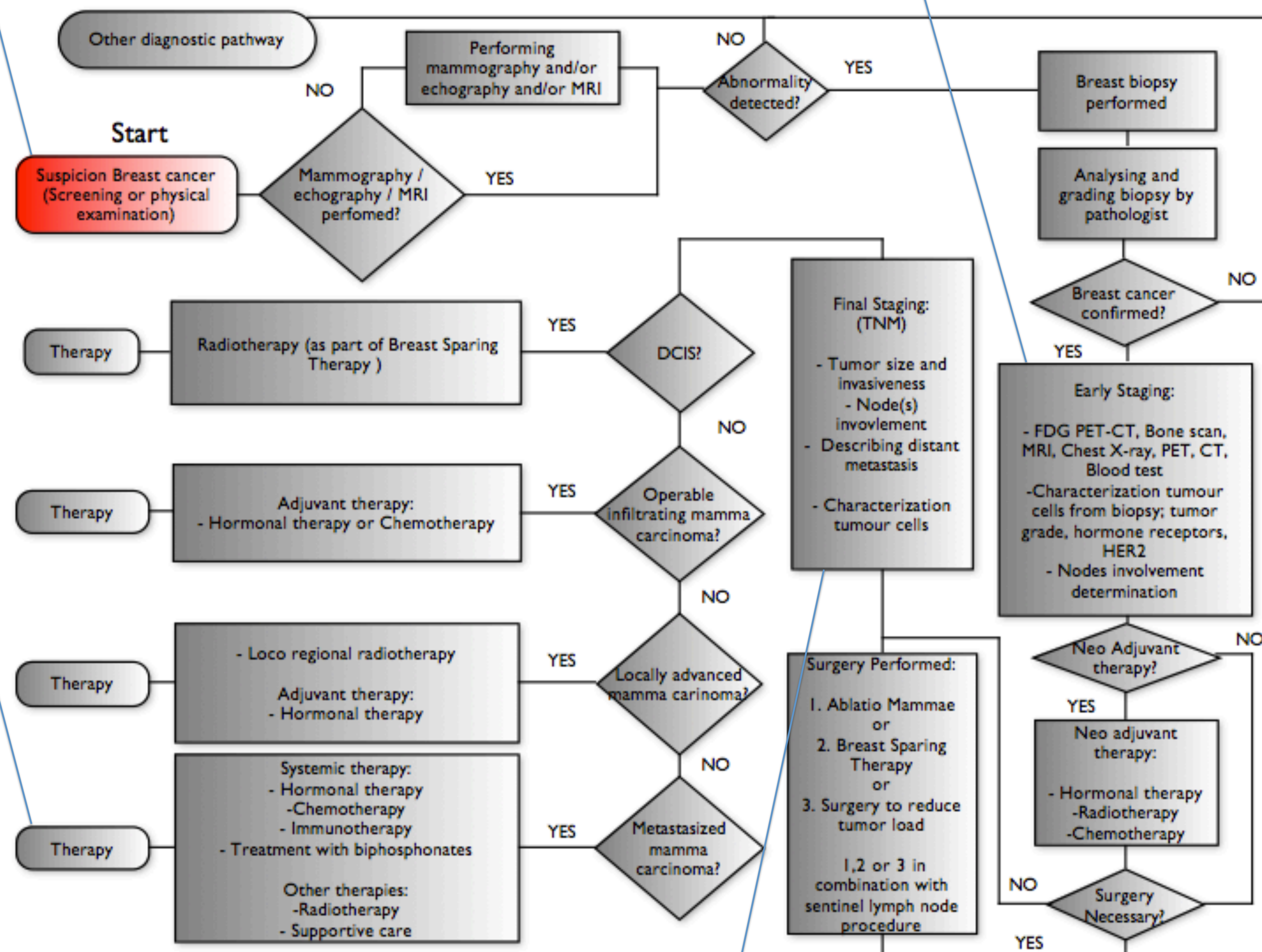


RESULTS

Option 1:	Expected Outcomes:
Screening for breast cancer (Detection)	<ul style="list-style-type: none"> - Eliminating false positive screening results - Eliminating unnecessary follow up diagnostics (indirect health gains, (QALY))

Option 2:	Expected Outcomes:
Early staging of tumors (Enumeration)	<ul style="list-style-type: none"> - Selecting therapy more specifically resulting in health gains (LY, QALY) - Cost savings

Option 4:	Expected Outcomes:
Therapy response monitoring (Enumeration)	<ul style="list-style-type: none"> - Cost savings expected by eliminating inefficient therapies



Option 3:	Expected Outcomes:
CTC Characterization for selecting therapy (Characterization)	<ul style="list-style-type: none"> - Enabling personalizing therapy by analysing discordance (between primary tumour and metastasis) in HR and HER2 expression - Gains in LY/QALY

It is expected that health gains and cost savings can be obtained if CTC trap is implemented as a screening or early staging tool (option 1 and 2). Health gains are also expected in option 3, but are accompanied by extra costs. Using the CTC trap as a monitoring tool only results in cost savings because ineffective therapies may be cancelled. However, the budget impact is low as the number of patients is less. The present study presents some first insights, yet further analysis should include uncertainty in the analysis.

Option	Target Population (Netherlands)	Exp. Health Gain (QALY)/Person	Exp. Cost Savings/Person	GAP (Savings included) WTP: €30.000
1	13.008	0,01	€ 159	€ 514
2	4.069	1	€ 12.351	€ 42.351
3	28	0,17	€ -19.457	€ -14.356
4	144	0	€ 2.214	

Option 3 in detail:

Primary tumor:	Therapy	Progression free survival	CTC's or metastases:	Therapy	Progression free survival	Estimated duration of improved effectiveness (progression free survival)
HR-, HER2-	Chemo	4,5 months	HR-, HER2+	Trastuzumab + Chemo	7,3 months	2,8 months
HR-, HER2-	Chemo	4,5 months	HR+, HER2+	Trastuzumab Hormone therapy	13,8 months	9,3 months
HR+, HER2-	Hormone therapy	4,8 months	HR+, HER2+	Trastuzumab Hormone therapy	13,8 months	9,0 months
HR-, HER2+	Trastuzumab Chemo	9,5 months	HR+, HER2+	Trastuzumab Hormone therapy	13,8 months	4,3 months

