cancer staging or surveillance in asymptomatic patients. Further studies are needed to characterize patients’ typology who deserve intensive staging and follow-up procedures.

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**DECIDING UPON NEW AND EXPENSIVE TECHNOLOGIES IN HEALTHCARE: REAL OPTIONS ANALYSIS IN PROTON THERAPY**

Guertner J1, Abrams K1, Deruysscher D2, Lambin P2, Pijls-Johannesma M3, Beutner E4, Peters H4, Joens MA1

1Maastricht University, Maastricht, Limburg, The Netherlands; 2University of Leicester—UK; 3MAASTRO Clinic, Maastricht, Limburg, The Netherlands; 4Maastricht University Medical Center, Maastricht, Limburg, The Netherlands

**OBJECTIVES:** Radiotherapy with protons is a promising new treatment modality, for which clinical guidelines and dosimetric data are being made worldwide. However, the investment cost of proton therapy (PT) is high (roughly €90 million) and limited clinical evidence is available. Also, previous studies have indicated that PT may be cost-effective, but show considerable decision uncertainty. Consequently, it is unclear whether we should adopt PT now, or wait for more information. Adoption involves a risk of facing high sunk costs, while delay may impose opportunity losses because patients receive suboptimal treatment. Real options analysis (ROA), a technique originating from financial economics, assists in making this trade-off. **METHODS:** We examined whether to adopt PT, as compared to stereotactic body radiotherapy, in the treatment of stage I non-small cell lung cancer (NSCLC). Three options are available: adopt without further research (AN); adopt and undertake a trial (AT); or delay and undertake a trial (DT). Based on the expected net gain of each option, which is calculated by summing the total costs from expected benefits. **RESULTS:** The expected net gain of at and DT were positive, indicating that we should not decide to adopt without further research (AN); adopt and undertake a trial (AT); or delay and undertake a trial (DT). The decision depends on the expected net gain of each option, which is calculated by summing the total costs from expected benefits. **CONCLUSIONS:** From a ROA perspective, we recommend to adopt PT in the treatment of stage I NSCLC, and to perform a trial with 450 patients. We have shown that ROA provides a transparent method of weighing the costs and benefits of all available options, to assist in decision-making upon new and expensive technologies.

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**SYSTEMATIC LITERATURE REVIEW ON THE INTER AND INTRA LABORATORY VARIABILITY OF MOLECULAR TESTING OF RESPONSE TO TREATMENT OF CHRONIC MYELOID LEUKEMIA (CML) PATIENTS AND THE ASSOCIATED COSTS AND COST-EFFECTIVENESS**

Rutigliano M1, Hudson FE2, Ossu D1

1Phmr Consulting, London, UK; 2Novartis Pharma AG, Basel, Switzerland

**OBJECTIVES:** During disease monitoring of patients with CML, for patients with a complete response, residual leukemia can be assessed by real-time quantitative polymerase chain reaction (RQ-PCR). There are several “home-brew” and commercially available BCR-ABL gene transcript detection methodologies in use, each requiring inter-laboratory validation for the specific laboratory and giving rise to laboratory-specific data. Harmonisation of results according to an international scale is underway, but use is limited for several technical reasons. Information is required for decision makers on the accuracy and reproducibility of the tests and their costs and cost-effectiveness. The objective of this study was to assess the quantity and quality of such information. **METHODS:** English language systematic literature review on the intra- and inter-laboratory variability for BCR-ABL molecular monitoring test, inter-rater reliability across manual assays and the costs and cost-effectiveness of molecular testing in CML. **RESULTS:** From 88 papers retrieved for detailed analysis, we found no studies which conducted a repeated test procedure on the same patient sample using the same technical approach in the same laboratory. There are a large number of studies which have compared alternative approaches using the same patient sample in molecular monitoring in the same laboratory. Several well-controlled studies have examined the variability of results from different laboratories in controlled environments. We found no studies which compared inter-rater reliability or examined the costs or cost-effectiveness of molecular testing in CML. **CONCLUSIONS:** There is a reasonable body of evidence on certain aspects of analytical validity, specificity and reproducibility of BCR-ABL molecular testing, but other aspects of analytical validity and the costs and economics of molecular diagnostics in CML appear to be an unresearched area. Testing variability has potentially serious implications for patient outcomes and more information for decision-makers to assess relative costs and cost-effectiveness is required.