# Cost-utility of liquid chromatography-tandem mass spectrometry (LC-MS/MS)-based urine analyses to improve adherence to antihypertensive treatment

Van Schoonhoven, A.V.; Van Asselt, A.D.; Gupta, P.; Patel, P.; Postma, M.J.

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PMD99
COMPARISON OF UTILITY COST IN THREE COMMERCIALLY AVAILABLE PRECISION MEDICINE APPROACHES IN ONCOLOGY
Russell KJ[1], Janssens J[2], Dean A[3], Hernandez A[1], Voss A[1]
[1]Caris Life Sciences, Basel, Switzerland, [2]University Hasselt, Hasselt, Belgium, [3]St John of God Hospital, Subiaco, Australia
**OBJECTIVES:** The introduction of molecular profiling as standard of care in cancer has led to the launch of a number of commercial precision medicine services, which differ largely in their approaches. It can be difficult for payers, physicians, and patients to distinguish between these services and determine which testing is most appropriate for an individual case. An understanding of the clinical utility and the utility cost (cost of finding one patient with clinical benefit) of the different approaches can help to set expectations for all stakeholders involved. The aim of this study is to define the utility cost of three leading commercially available oncology precision medicine approaches, Caris Molecular Intelligence® (CMI), FoundationOne® and PCDx™. **METHODS:** A systematic review of all published clinical evidence for the three services was performed, to determine the number of patients treated in line with the profiling results and the clinical benefit resulting from these treatment choices. Utility cost was defined as the list price divided by the fraction of patients treated based upon the profiling results and the clinical benefit in treated patients. **RESULTS:** Based on the number of profiled patients treated and the corresponding number of patients with clinical benefit, 34% of CMI-profiled patients had clinical benefit (184 of 534 profiled patients), compared to 6% of those profiled with FoundationOne® (166 of 2,675 profiled patients) and 11% profiled using PCDx™ (19 of 168 profiled patients). Utility cost was calculated as $19,118 for CMI, $43,636 for PCDx™ and $96,667 for FoundationOne®. **CONCLUSIONS:** The results of this study shows that the multiplatform approach of CMI brings the highest clinical utility, based on the use of conventional chemotherapies in the majority of patients profiled. A low clinical utility means that almost 20 cases of FoundationOne® must be purchased to find one patient who benefits.

PMD100
COST-UTILITY OF NOVEL TESTS AFTER A NEGATIVE PROSTATE BIOPSY
Dragomir A[1], Palenius E[2], Aprikian A[3], Kassouf W[3], Bonnevier E[2], Nazha S[3]
[1]McGill University, Montreal, QC, Canada, [2]Lund University, Lund, Sweden, [3]McGill University Health Centre, Montreal, QC, Canada
**OBJECTIVES:** Transrectal Ultrasound-Guided Biopsies (TRUSGB) are today the main approach of diagnosing prostate cancer but overdiagnosis and sampling errors are major limitations. Magnetic Resonance Imaging-Guided Biopsies (MRGB) have been researched and previously published as an alternative approach. In this study, five tests for use after an initial negative biopsy for better patient stratification were assessed: PCA3, ConfirmMDx, Prostate Core Mitomic Test (PCMT), Prostate Health Index (PHI) and the 4Kscore. The resulting costs and QALY were compared to the use of TRUSGB and MRGB. **METHODS:** A Markov model was used over 5, 10, 15 and 20 years. All tests were performed on patients referred to a second biopsy due to a remaining suspicion of prostate cancer after an initial negative biopsy. The Markov model considers the probability of harboring prostate cancer, diagnostic accuracy of the tests, the stratification of patients after performing the tests and probabilities of being assigned to different treatments. The included costs were direct cost in the Quebec health care system perspective. **RESULTS:** Introducing PCA3 resulted in cumulative effects at 7,24, 9,12 and 10,21 QALY after 10, 15 and 20 years. The corresponding values for ConfirmMDx were 7,24, 9,13 and 10,21. PCMT, PHI and 4Kscore were excluded during the systematic literature review due to lack of data. The cumulative costs using PCA3 after 10, 15 and 20 years were $11525, $14951 and $17480. The corresponding costs for ConfirmMDx were $11706, $15092 and $17598. The costs and QALY were compared to the approach used today, TRUSGB, and the incorporation of MRGB. Both strategies, PCA3 and ConfirmMDx, demonstrated similar costs and QALYs as the standard strategy TRUSGB. **CONCLUSIONS:** Introducing the new tests showed potential of use in clinical practice, demonstrating similar clinical and economic outcomes when compared to TRUSGB.

PMD101
COST-UTILITY OF LIQUID CHROMATOGRAPHY -TANDEM MASS SPECTROMETRY (LC-MS/MS)-BASED URINE ANALYSES TO IMPROVE ADHERENCE TO ANTIHYPERTENSIVE TREATMENT
van Schoonhoven AV[1], van Asselt AD[1], Gupta P[2], Patel P[2], Postma MJ[1]
[1]University of Groningen, Groningen, The Netherlands, [2]University of Leicester, Leicester, UK
**OBJECTIVES:** In the UK, over 28% of the population are estimated to suffer from hypertension. A high systolic blood pressure (SBP) increases the risk for cardiovascular disease (CVD). While antihypertensive medications, along with lifestyle changes, are deemed effective in combatting hypertension, adherence to drug treatment may not be optimal. Data from UK patient samples show that discussion of the results from LC-MS/MS-based urine analyses with patients can improve adherence significantly. The objective of this study was to determine whether performing LC-MS/MS–based urine analyses is cost-effective by improving adherence in hypertensive patients. **METHODS:** Cost-utility analysis was performed from a UK healthcare payer perspective over a lifetime horizon. A Markov model was adapted from an existing published model in a UK setting. Hypertensive patients entered the model event-free, but at risk for cardiovascular events. Effectiveness of urine analysis was modelled by lowering the probability of having an event, as a consequence of lowered SBP by improved adherence to drug treatment, as found in the empirical study. Cost and utilities were derived from literature. The base case cohort consisted of males aged 65. Further analysis varied sex and age of the population. Subgroup analysis concerned those with resistant hypertension, and univariate and probabilistic sensitivity analyses were also performed. **RESULTS:** The intervention resulted in an incremental health benefit of 0.020 quality-adjusted life-years (QALYs) per patient, and incremental cost was -£867 per patient, i.e. the intervention strategy is dominant compared to care as usual. Sensitivity analyses showed that targeting younger patients (aged 45) or only patients with resistant hypertension would increase cost savings and QALY gains. **CONCLUSIONS:** Using LC-MS/MS-based urine analyses to improve adherence in hypertensive patients is an effective and cost-saving strategy, especially in patients with resistant hypertension, since non-adherence is found to be higher in this population.

PMD102
PATTERNS IN WORKING DAYS LOST BY PARENTS OF CHILDREN NEWLY-DIAGNOSED WITH TYPE 1 DIABETES (T1D)
Ridyard CH[1], Blair J[2], Hughes DA[1], On behalf of the SCIPI Trial Investigators[3]
[1]Bangor University, Bangor, UK, [2]Alder Hey Children's NHS Foundation Trust, Liverpool, UK, [3]Clinical Trials Research Centre, Liverpool, UK
**OBJECTIVES:** Continuous subcutaneous insulin infusions (CSII) are an alternative to multiple daily injections (MDI) for glycaemic control and reducing the risk of developing long term microvascular and macrovascular complications in type 1 diabetes (T1D). The objective of this study as part of a randomised clinical trial (SCIPI, ISRCTN29255275) was to assess patterns of work-related absences, and whether a difference was apparent between treatment groups. **METHODS:** Patients between 7 months and 15 years of age, newly diagnosed with T1D were eligible to participate in this pragmatic, open, multicentre, parallel group, randomised, controlled trial. Parental work-related absences in days from the preceding 3-months were measured by parental interview at randomisation, 3, 6, 9 and 12 month intervals. **RESULTS:** Actual time taken off work was reported by parents and/or guardians for 78% of participants (CSII=113, MDI=117). Absence from work between randomisation and 12-month follow-up in parents of patients in the CSII group was 3.6 days (95% CI 2.3, 4.9) compared to 2.7 days (1.9 to 3.4) in the MDI group [difference in means of 0.9 days (95% CI -0.6, 2.5)]. In the 3-month period prior to randomisation, however, absence from work in parents of patients in the CSII group was 5.5 days (95% CI 4.7, 6.3) compared to 4.9 days (4.1 to 5.7) in the MDI group [difference in means of 0.6 days (95% CI -0.5, 1.7)]. **CONCLUSIONS:** T1D diagnosis for a child can have a temporary disruptive influence on parental work commitments. However, there is no evidence to suggest that one treatment is associated with any more or less work-related absences than the other.

PMD103
IMPACT OF ADENOMA SURVEILLANCE GUIDELINES ON THE FUTURE DEMAND OF COLONOSCOPIES ASSOCIATED TO A POPULATION-BASED COLORECTAL CANCER SCREENING PROGRAM
Comas M[1], Andreu M[2], Juárez D[2], Louro J[1], Bessa X[2], Buron A[1], Castells X[1]
[1]IMIM (Hospital del Mar Medical Research Institute); Red de Investigación en Servicios de Salud en Enfermedades Crónicas (REDISSEC), Barcelona, Spain, [2]IMIM (Hospital del Mar Medical Research Institute), Barcelona, Spain
**OBJECTIVES:** Recent European guidelines recommend colorectal cancer screening of average-risk population. Besides colorectal cancer, adenomas are found. Adenomas deserve surveillance through colonoscopy, but there is no clear recommendation on its frequency and several guidelines are proposed. Our objective was to estimate the demand of colonoscopies to undergo recommended surveillance of adenomas found under a population-based colorectal cancer screening program following three different guidelines. **METHODS:** A previous discrete-event simulation representing a colorectal cancer screening program for a target population of 100,000 women and men aged 50 to 69 years was used to account for resources at the follow-up phase after screening. The underlying conceptual model was based on the European Guidelines for the screening process. For follow-up after adenoma removal, three guidelines were implemented and compared: that of the Catalan Society of Gastroenterology, that of the European Society of Gastrointestinal Endoscopy and that of the US Multi-Society Task Force. Parameters were estimated from the Colorectal Cancer Screening Program of Barcelona and follow-up colonoscopy results from the literature. A 10-year horizon starting in 2015 was simulated. The model included the population ageing and projections. **RESULTS:** The predicted 10-year cumulative number of colonoscopies was 16,180 for the Catalan, 15,415 for the European and 15,266 for the US guidelines, representing the Catalan guideline 5% and 6% more colonoscopies than the European and the US guidelines, respectively. The number of colonoscopies after a positive FIT was similar, while the number of adenoma surveillance colonoscopies was higher for the Catalan guideline: 26.1% and 35.6% higher than the European and the US guidelines, respectively, while the European guideline presented a 7.5% more surveillance colonoscopies than the US guideline. **CONCLUSIONS:** The choice of the surveillance guidelines for follow-up of adenomas found under a population-based colorectal cancer screening program is relevant in terms of its impact on the demand of colonoscopies.

## MEDICAL DEVICES/DIAGNOSTICS – Patient-Reported Outcomes & Patient Preference Studies

PMD104
PATIENT INSIGHTS IN COPD MEDICATION ADHERENCE FROM PHARMACY DATA
Sperber CM, Samarasinghe S, Collins C, Lomax G
Patient Connect, Guildford, UK
**OBJECTIVES:** Over half of patients with chronic obstructive pulmonary disease (COPD) struggle to use a metered dose inhaler correctly. Strikingly, therapies seem to vary from country to country. For instance, the three strengths of a specific dry powder inhaler prescribed in Germany are consistently 20%/25% lower for their two active ingredients than the corresponding three strengths dispensed in the UK. This study attempts to quantify the impact of this difference on patient behaviour. **METHODS:** To quantify adherence we used two comprehensive anonymised patient level datasets comprising 13,337 and 20,252 unique patient IDs for the UK and Germany, respectively. Each patient was followed for 365 days and a Medication Possession Ratio (MPR) trend calculated using the FMPR methodology. We then compare the two patient groups applying different filters. **RESULTS:** This study indicates that patients in the UK exhibit a significantly higher adherence than patients in Germany. However,