Methods: A probabilistic model with a Markov-type process was used to depict lifetime risks and costs of pneumococcal disease among a cohort of English adults. Epidemiologic parameters, serotype coverage, costs, vaccine effectiveness and coverage were based on published literature or publicly available data. The National Health Service perspective was adopted, health effects were expressed in quality-adjusted life years (QALYs), and future costs and QALYs were discounted at 3.5 percent.
Results: Results suggest that under reasonable assumptions concerning disease burden, vaccine, effectiveness, and vaccine cost, PCV20 implementation of an age-and risk-based strategy targeting all adults aged 65 years or older and younger risk group adults aged 18 to 64 years would reduce a large number of pneumococcal disease hospitalizations and pneumococcal-related deaths compared to currently recommended PPV23.
The incremental cost-effectiveness ratio was well below the current willingness-to-pay range of GBP20,000-GBP30,000 per QALY gained, with PCV20 being cost saving compared with PPV23 in base case and most sensitivity analyses. Probabilistic sensitivity analysis suggests high certainty in recommending PCV20 for vaccination of adults aged 18 to 64 years in risk groups and all aged 65 years or older instead of PPV23.
Conclusions: Our findings support replacing PPV23 with PCV20 to directly protect adults against pneumococcal disease, reducing hospitalizations and saving lives in the UK.

OP79 Gene Expression Profiling In The Diagnosis Of Aggressive Large B Cell Lymphoma: An Early Exploratory Economic Evaluation

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Introduction: The addition of gene expression profiles (GEP) to the current clinicopathological diagnosis of aggressive large B cell lymphomas may lead to the reclassification of patients, treatment changes and improved outcomes. A GEP test is in development using TempoSeq technology to distinguish Burkitt Lymphoma (BL) and Primary Mediastinal Large B Cell lymphoma (PMBCL) from Diffuse Large B Cell Lymphoma (DLBCL). This study aims to inform developers about the potential impact of the test on costs and health outcomes, and pricing and evidence generation strategies.
Methods: Decision models compared current diagnosis with current plus GEP signatures over a lifetime horizon using a UK health and social care perspective. Inputs were taken from the literature and based on assumptions. Threshold estimates were made of the maximum price of the test and impact of incorrect disease classification using a threshold of GDP30,000 (USD37,155) per Quality Adjusted Life year (QALY). One way sensitivity analysis was conducted.
Results: At base case values the BL signature delivers incremental QALYs of 0.0249 at an additional cost per patient of GBP508 (USD629). This results in a net monetary benefit (NMB) of GBP239 (USD296). The PMBCL signature delivers 0.0011 QALYs, a cost saving of GBP202 (USD250) and an NMB of GBP236 (USD292). The maximum threshold price for a combined test to be cost effective is GBP776 (USD961) (base case GBP400 (USD495)). Results are sensitive to cost differences in first line treatments and impact of false diagnoses.
Conclusions: A combined test could be cost-effective in a UK context at a price around GBP750 (USD929). The developers can use this estimate to inform return on investment calculations. The number of patients who were reclassified as a result of the addition of GEP in our model was taken from small retrospective studies and the impact of false diagnoses was based on limited evidence. If the developers choose to proceed with the development, these aspects should be incorporated in evidence generation strategies.

OP80 Diagnostic Molecular Sequencing Of DNA (Exomes And Genomes) Is Not Perfect: Implications For HTA

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Introduction: The recent release of powerful next-generation sequencing platforms, which can provide whole exome sequencing (WES) or whole genome sequencing (WGS) in quicker timelines and at reduced costs, has resulted in proposals for these diagnostic testing methods to be routinely integrated into clinical practice in multiple settings. However, the complexities of these diagnostic approaches, and the minimal comparative evidence available on them, creates difficulties in the evaluation of their diagnostic performance. Novel approaches need to be developed to improve the health technology assessment (HTA) of WES and WGS.
Methods: Several HTAs on genetic testing and the use of WES or WGS in fetal medicine were reviewed. Information on factors associated with this diagnostic modality that affect typical test accuracy assessment (e.g., sensitivity and specificity) was extracted. The multiple steps required for completing a WES or WGS test, and the potential for the introduction of errors (type I or type II) at each of these steps, were mapped and examples provided. The clinical and economic implications associated with imperfect and uncertain test accuracy were described.
Results: Limited data on analytical and clinical validity were identified. WES and WGS are multistep processes and errors were found in sampling, molecular sequencing, bioinformatic filtering, and variant interpretation; therefore, the assumption that WES or WGS is 100 percent sensitive or specific is not reasonable. Although alternative evidence-based estimates are unlikely to be available, the inevitability of such errors, and their implications in terms of comparative effectiveness, safety, and cost effectiveness, should be described in HTAs.
Conclusions: While unknown diagnostic accuracy remains an issue with WES and WGS testing, formal sensitivity analysis of test performance characteristics should be conducted as part of HTAs. A checklist has been developed to assist those involved in HTA and

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policy to understand the potential for inaccurate test results in clinical practice, and the risk-benefit implications of these diagnostic errors for patients.

OP81 Cost Effectiveness Of Human Papillomavirus Extended Genotyping For Cervical Cancer Screening In Singapore

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Introduction: The World Health Organization recommends the human papillomavirus (HPV) test for cervical cancer screening. HPV partial genotyping (PGT) identifies HPV16 and HPV18 individually and the 12 other high-risk HPV genotypes (hrHPV) collectively. In contrast, HPV extended genotyping (XGT) identifies six hrHPV individually (HPV16,18,31,45,51, and 52) and the other eight in three groups (HPV33/58, HPV56/59/66, and HPV35/39/68). XGT allows better risk stratification for patient management and monitoring of persistent same-genotype infections (PSGI), which convey a higher risk for cervical cancer. This study compared the cost, quality-adjusted life-years (QALYs), and resource use of XGT with PGT when used as the primary cervical cancer screening method in Singapore.
Methods: A discretely integrated condition event simulation was developed for screening 500,122 women aged 30 to 69 years over five years from the health system perspective, using a three percent annual discount. For XGT, women with HPV35/39/51/56/59/66/68 and reflex cytology of atypical squamous cells of undetermined significance were recalled for a repeat screening in one year, instead of the immediate colposcopy referral that occurs with PGT. At repeat screening, colposcopy was only provided for women with PSGI on XGT. Published data from Singapore were used for inputs and supplemented with data from international literature. Deterministic and probabilistic uncertainty analyses were conducted. Scenario analysis was conducted to simulate various HPV burdens among women. XGT was cost effective when the incremental cost-effectiveness ratio (ICER) relative to PGT was below SGD100,000 (USD118,906) (gross domestic product per capita in 2021).
Results: XGT was cost effective relative to PGT (ICER SGD16,370 [USD19,465]), with fewer colposcopies (n=7,130; 19%), liquid-based cytology tests (n=6,027; 7%), and clinic consultations (n=9,787; 2%) but more HPV tests (n=2,446; 0.5%). The ICER was most sensitive to the relative cost of XGT and the cost of PGT. XGT remained cost effective in one-way sensitivity analysis in all 1,000 probabilistic uncertainty simulations and in scenario analysis with various HPV burdens.
Conclusions: XGT can provide a cost effective, risk-based approach to primary cervical cancer screening, with lower resource utilization than PGT.

OP82 Positron Emission Tomography Combined With Computed Tomography Using 18F-Sodium Fluoride

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Introduction: Positron emission tomography combined with computed tomography (PET/CT) using 18F-sodium fluoride (18F-NaF) is used for functional imaging in diseases to detect abnormally altered osteogenic activity, such as benign and malignant bone diseases and inflammatory or traumatic changes in skeletal bones.
Methods: A systematic search of literature using keywords in the MEDLINE database was conducted to identify literature on the clinical and cost effectiveness of using PET/CT with 18F-NaF-based radiopharmaceuticals in the diagnosis of bone and cartilage cancer. The search retrieved 323 publications. The analysis included 11 publications that met the selection criteria, including one meta-analysis and ten literature reviews.
Results: The pooled sensitivity, specificity, diagnostic odds ratio (DOR) and area under the receiver operating characteristic curve of 18F-NaF-based PET/CT for the detection of bone metastases were 0.98 (95% confidence interval [CI]: 0.95, 0.99), 0.90 (95% CI: 0.86, 0.93), 123.2, and 0.97, respectively. 18F-NaF-based PET/CT was highly effective in detecting bone metastases during staging and restaging of patients with high-risk prostate cancer. The effectiveness of 18F-NaF-based PET/CT was superior to bone scintigraphy with technetium-99m and single-photon emission computed tomography (SPECT) and was comparable to diffusion-weighted imaging.
Conclusions: PET/CT with 18F-NaF is a more accurate method of localizing and characterizing malignant bone lesions than SPECT. This method has improved clinical accuracy and provides greater convenience for patients and referring physicians. PET/CT with 18F-NaF in malignant neoplasms is a more specific, sensitive study than 18F-fluorodeoxyglucose PET/CT. These results were submitted to the Ministry of Health for a decision on the inclusion of 18F-NaF-based PET/CT in the state reimbursement system.

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