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Evidence-Based Purchasing in Cardiology: Cost-Effective Healthcare Technology Assessments

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The Centre for Evidence-based Purchasing (CEP) was created within the UK National Health Service (NHS) Purchasing and Supply Agency (PASA). Funded by the UK Department of Health (DH) it delivers free, independent and impartial evidence to healthcare providers to underpin purchasing decisions and to drive adoption of useful, innovative healthcare technologies in the NHS. This article will focus on CEP projects relating to innovations in cardiology management and report on how we contribute to the evidence-base for demonstrating cost-effectiveness in procurement.

Our central role is to provide assessments on clinical utility and cost-effectiveness, supporting the delivery of DH and NHS policies and priorities. Our multi-faceted work programme is planned through extensive consultation with national organisations and professional bodies, ensuring best use of our resources and an impact on procurement.

CEP commissions projects from a range of multidisciplinary expert groups, many in NHS and academic institutions in the UK. Our reports, summarised here, and freely available to download from the CEP website, include:

- Advances in Cardiac Imaging
- Surgical Intervention and Post-Intervention Care
- Vacuum Assisted Closure® (VAC) Therapy
- Implantable Cardiac Devices
- Centralised Telehealth Services
- Ultrafiltration Therapy & Heart Failure

Advances in Cardiac Imaging

CEP published an evidence review of multi-channel radiofrequency (RF) and parallel imaging technologies for magnetic resonance imaging (MRI) scanners. Multi-channel RF and parallelimaging technologies are hardware and software implementations respectively, aimed at improving the coverage, signal, resolution, and speed of MR examinations. CEP reached a verdict that these advances have significant potential for delivery of cardiovascular imaging services.

Faster scanning could increase patient throughput, as well as dramatically improve patient comfort during scans. The ability to achieve higher resolution without increased examination times is particularly valuable in most MRI cardiovascular examinations.

Surgical Intervention and Post- Intervention Care

We also published an evidence review of oesophageal doppler monitoring (ODM) in patients undergoing high-risk surgery and in critically ill patients. For such patients, cardiac output monitoring may be used to guide fluid replacement and drug treatment, helping to maintain adequate blood supplies to the tissues. ODM may therefore have the potential to reduce mortality, complication rates, length of stay in critical care facilities and overall hospital stay.

Studies Question Use of Pulmonary Artery Catheter

Recent studies indicate that the pulmonary artery catheter, traditionally used to monitor cardiac output, may not be beneficial in these groups of patients. Patients undergoing surgery or critical care may receive only non-invasive assessment of markers such as heart rate, systolic blood pressure, and urinary output (conventional clinical assessment), with or without catheter-based measurement of central venous pressure (CVP); the anaesthetist generally decides which patients also need monitoring of their cardiac output.

ODM is already widely used in the NHS: one such type of monitor is used in around 25,000 patients each year; but considering the large number of potential patients, its use seems to be relatively infrequent. CEP reached a verdict that ODM offers significant potential for these two categories of clinical use, including the potential cost benefits of reduced hospital stay, with the report presenting these conclusions in more detail.

Vacuum Assisted Closure® (VAC) Therapy

CEP has published an evidence review of Vacuum Assisted Closure® (VAC) therapy, a device that applies topical negative pressure to accelerate wound healing of complex and non-healing wounds, such as diabetic ulcers or infected sternal wounds. VAC therapy uses a combination of vacuum suction and specialised dressings to facilitate wound drainage and influence the growth of surface tissues.

The majority of evidence does indicate a benefit in comparison with 'standard wound care' e.g. saline moist gauze, however the benefit is less clear when compared with 'advanced wound care' (e.g. hydrocolloids, alginates), in the treatment of chronic and acute wounds. CEP is currently working on a project to review the evidence for these advanced wound care dressings.

Implantable Cardiac Devices

An evidence review and economic report on implantable cardiac devices with remote monitoring facilities is in preparation. Patients with pace makers, implant - able cardioverter defibrillators (ICDs) and other implanted cardiac devices require regular monitoring to ensure that the implanted device is working optimally and still suits the cardiac disease for the individual patient. This monitoring is usually undertaken at hospitals with specialised equipment and highly experienced staff.

Additional follow-up visits may be required to investigate symptoms that may or may not relate to either the implanted device or patients' cardiac condition. Home monitoring could allow many of these follow-up visits to be carried out remotely, without the patient having to attend hospital. The economic evaluation compares the costs and outcomes associated with the treatment pathway for remote monitoring to the current monitoring pathway.

Centralised Telehealth Services

A national framework agreement launched by the NHS Purchasing and Supply Agency, cover telehealth equipment, installation, maintenance, monitoring and response services. Services relating to cardiology management in the home were evaluated by CEP and include remote monitoring of blood pressure, blood glucose and cardiac arrhythmia, plus integrated health monitors and medication reminder systems.

This 'once-only' EU tendering exercise allows commissioners to access telehealth products and services directly from the framework, without the requirement to run a local EU tender exercise, thereby saving costs and staff time. The provision of a teleheath service allows patients to remain under observation at home, improving their lifestyle and wellbeing, whilst minimising unnecessary hospital admissions and enabling cost and efficiency savings to the NHS as a result.

Ultrafiltration Therapy & Heart Failure

CEP completed an extensive project reviewing the evidence and developing a cost analysis for ultrafiltration (UF) therapy for the removal of excess fluid in patients with heart failure, with a subsequent evaluation of the performance of one commercial product, the CHF Solutions Aquadex Flexflow. Ultra - filtration is a non-pharmacological therapy for removing excess water and salts from the bloodstream.

CEP reached a verdict based on the evidence reviewed and evaluation of the Aquadex Flexflow that UF offers significant potential to become a routine therapy for excess fluid removal in patients with congestive heart failure. However, further work is needed to establish the patient groups who would benefit most, the optimal rates of fluid removal, the conditions for termination of therapy, and the cost savings associated with long term quality of life benefits.

The cost analysis modelled the clinical pathway associated with the use of ultrafiltration compared with diuretics, for patients with chronic heart failure in an inpatient setting. Consumables were identified as the key driver for the higher treatment cost of ultrafiltration; however, its use in a day case setting significantly reduced treatment costs. The analysis was limited by the data available and an interactive model is available on the CEP website to allow the input of individual data to encourage further data collection at local level to support local purchasing decisions.

Full copies of all CEP reports are free to download from: www.pasa.nhs.uk/cep

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