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The Economics of Interventional Radiology

Healthcare teams naturally strive to provide patients with the most effective treatments, resulting in the best possible clinical outcomes. There are however, inevitable budgetary limits to which treatments and procedures can be made available. The economic impact of clinical decisions should therefore always be considered, especially as new technologies become available and costs rise. This is as true for interventional radiology (IR) as it is for any other specialty, especially given that IR is a technology-centred branch of medicine and is often perceived as expensive.

Maximum Health at a Reasonable Cost

Whereas healthcare professionals may treat patients without full consideration of costs or affordability, hospital managers are often perceived as being in opposition and might focus primarily on budget containment. Budget management is, of course, necessary but it is important not to forget the end objective of healthcare, which is to produce health, and not just save money for its own sake. Many IR techniques have revolutionised the clinical management of certain diseases and so they deserve to be considered and should not be rejected outright due to an assumption of high cost.

As budgets are not infinite, the reality of modern healthcare is that decision-makers and payers consider economic as well as clinical data when making difficult funding allocation decisions. The costs of a treatment are weighed up against the benefits it provides, the legitimate aim being the production of maximum health at the most reasonable cost. In other words, the goal is to obtain value for money, which is often measured in terms of cost per quality-adjusted life-year (QALY).

In the UK, for example, the cost-effectiveness of a new treatment is conventionally assessed as an incremental cost-effectiveness ratio (ICER), which is derived from a comparison of the new treatment's cost-benefit ratio to that of the conventional treatment. In the UK healthcare system, such assessment is based on decision making at the National Institute for Health and Clinical Excellence (NICE) and to be deemed cost-effective a treatment usually requires an ICER below UK£20,000 - £30,000.

Understanding Economics to Defend IR

As well as being aware of the economic landscape of healthcare as a whole, it is useful for radiologists to know some detail about the methods involved in the economic evaluation of treatments and procedures. This will enable them to engage effectively with managers, who might seek to veto a valuable therapy for reasons of cost.

Decision-makers want to be sure that the outcomes of an expensive procedure justify the high purchase cost, so if the long-term benefits of an expensive intervention can be demonstrated then the intervention is more likely to be approved. An IR treatment option that is expensive at face value can often turn out to be the most prudent choice if it saves costs in the long run and is appropriate for the patient group in question. Interventions that offer the best ratio of costs and effects are the ones that should be prioritised and preferred. After asking if a new therapy works, the next natural question should address the cost for society and ask whether the therapy represents value for money.

Is IR Worth the Investment?

Being minimally invasive also means that in many circumstances, IR procedures are an improvement upon the conventional treatment in that they are more effective and less costly. Using imaging to guide biopsy is an example of this, as the alternative (e.g. an open surgical biopsy) is likely to have higher risks and be more expensive. On the other hand, some of the devices that interventional radiologists use do entail comparatively high spending in terms of the initial cost of the device, but this is usually offset by savings in other areas. Although hard to quantify, it is also noteworthy that patients tend to prefer IR treatments due to their being minimally invasive.

Being minimally invasive also means that IR patients may not need to spend time in high dependency care (ITU/HDU) and have reduced hospital stays generally, which produces significant cost savings. This is one of the reasons that interventional radiological techniques have often replaced invasive surgery such as in the common use of vena cava filters to prevent pulmonary embolisation; no one would now consider performing the surgical alternative of open IVC ligation.

Often the value of IR lies in it being lower risk compared to the alternative surgical procedure. Aortic stent grafting to treat traumatic aortic transection is an example of this. Traditionally, major cardiothoracic surgery is performed to repair the damaged thoracic aorta. For a seriously injured patient, after a road traffic accident for example, this has a very high morbidity and mortality rate. In avoiding major surgery, the use of stent grafts reduces this risk as they can be placed from an artery in the groin to cover and seal the damaged aorta. Long-term outcomes are also important when considering the economic value of a procedure. An expensive intervention may prove its worth if it

prevents a disability that would result in more costly long-term care, or loss of quality of life for the patient. The International Subarachnoid Aneurysm Trial (ISAT) showed that endovascular coiling of intracranial aneurysms, though the procedure itself was more costly, resulted in better outcomes for patients compared to surgical clipping, and the long-term costs saved in preventing disability mean that the IR method is not only more effective clinically but is also cost effective.

Increasing Use Lowers Costs

Initially, many new IR procedures are comparatively expensive, but this is partially related to their small market base at the time of introduction. When a new technology with a limited market is developed, prices must understandably be set at a level that covers development costs and prevents the seller making a loss. As acceptance and clinical evidence accumulates, usage increases and the cost may be reduced. For example, there is now an evidence base stating that coronary stents and stents used for treating certain lesions of the superficial femoral artery (particularly drug eluting stents) are more effective compared to angioplasty alone. In terms of cost-effectiveness, however, the details surrounding these devices are still not clear. Nevertheless, with increasing use of stent technology due to proven clinical efficacy, prices have come down and the respective side of the cost-benefit equation is improved.

Building a Case for IR

Only radiologists themselves are in a position to influence funding decisions around IR, as managers may be too focused on the up-front costs. By being involved in developing business cases for new procedures, comprehensively presenting the costs and benefits to payers, interventional radiologists can ensure that the best and most appropriate treatments are funded and made available to patients.

IR has many new and rapidly evolving technologies, a phenomenon that has made cost assessment difficult and has resulted in a lack of cost-effectiveness data. The collection of quality data is expensive, time consuming and would ideally be performed as part of a large-scale clinical trial. However, this is often beyond the scope of the assessment of a new technique or device. Such trials need to be powered correctly and may not be logistically possible. As a result of these obstacles, smaller scale evidence such as case series are critical in showing the cost-effectiveness of new interventions. Any quality data on the cost-effectiveness of a treatment should then be included alongside clinical efficacy in treatment guidelines, strengthening the message of support for the treatment in question.

As well as collecting and reporting data, interventional radiologists should be at the forefront of the tendering and purchasing of devices for their department and should be up to date with evidence on costs and effectiveness of new technologies. Manufacturers are sometimes reluctant to present cost-effectiveness data, fearing that their product might not be shown in the best light. However, as economic evaluation of health technologies becomes standard practice, working with manufacturers to present the relevant data might help this technology's adoption and survival in a competitive marketplace.

Collaboration a Profitable Approach

Cooperation with manufacturers can also allow selected departments to act as a repository for more expensive devices, which may also be consignment stock to help control inventory costs. For example, when a stent graft is required in an emergency it can be made available to other centres through a coordinated network. This system enables more centres to provide an IR service at a reasonable price.

By offering high-quality and wide-ranging IR procedures a centre increases the likelihood that it will receive case referrals. An institution's profit depends on the reimbursement scheme of the particular healthcare system in which it is situated. Nevertheless, as long as the reimbursement for both elective and emergency IR procedures is adequate, then performing more IR is not only beneficial to patients but is also likely to make financial sense for the individual institution.

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