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Urgent Update

How financing is enabling improved standards in diagnostic imaging

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Abstract

Healthcare systems across the globe are under increasing financial pressure – whether to contain the cost of healthcare delivery in mature infrastructures or to build universal access systems for the very first time. As a result, a strategic mindset change is taking place. Rather than simply struggling with the increasing burden of escalating healthcare demand, healthcare institutions, policymakers, insurers and governments are now looking to create more healthy communities that use less healthcare.

Fundamental to this approach is access to diagnostics technology – underpinning the ability to detect conditions (or pre-conditions) early and accurately, act preemptively, enable better health outcomes for the patient and prevent the need for expensive acute treatment and/or long-term chronic condition management.

There is a problem in some countries because access to diagnostic imaging technology is insufficient. Even where access is high, a proportion of the technology fleet aging (over 10 years old) and in urgent need of replacement to bring it up to modern standards of accuracy, capacity and reliability.

This short research note focuses on the very modest ambition to replace the most seriously aging segment of diagnostic imaging equipment, and looks at the financing techniques that leading healthcare institutions are using to make these acquisitions more affordable and sustainable, even in the face of today's financial pressures.

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Return on technology investment

What, then, are the key factors that can help reduce healthcare costs and improve healthcare outcomes? Certainly new, or improved, therapies or "cures" are critical. Equally, reforming healthcare processes (known as "pathways") can make a huge contribution to both effectiveness and efficiency. Alongside these critical factors, however, technology often plays a disproportionately positive and significant role. In other words, certain technological innovations and improvements can substantially reduce the need for (and cost of) treatment in the short, medium and long-term. Not only can technological improvements improve efficiency – treating more people, quicker and at less cost. They can also actually improve health outcomes – for instance, detecting a disease or condition and triggering early interventions for radically improved health outcomes.

Healthcare equipment spending in most countries is estimated to be only a small proportion – around 5% – of total cost of healthcare delivery.¹ So, it is clear that a relatively small investment in technology may introduce significant improvements that pay for themselves many times over.² Improvements may be immediate savings, for example through faster and/or more accurate diagnoses, or simply preventing future costs from escalating as healthcare demand grows – the result of an aging demographic along with chronic conditions arising from lifestyle habits that tend to accompany growing prosperity. This of course then has an impact on how the remaining 95% of a country's healthcare budget is delivered. If up-to-date diagnostic equipment results in earlier, less invasive and therefore more cost-effective treatments, less healthcare budget is needed to deliver that treatment.

Financial pressures and healthy communities

Healthcare systems around the world are all under financial pressure. The reasons may be different from region to region (even country to country) but the effect is the same. In the USA, structural change with the Affordable Care Act has imposed new financial pressures on healthcare provision. Generous, largely state-governed healthcare systems in Europe are facing austerity pressures as they struggle to afford delivery of universal and comprehensive healthcare services tax-paid or insurance-paid at the point of consumption. China, India and Turkey – each very different countries and cultures – share the common issue of finding financially sustainable ways of developing their universal healthcare systems for the first time.

Strategic attitudes toward how healthcare is managed in society are also changing. Around the world, a new approach to healthcare is emerging, focused on preventative measures and health education to create more "well" communities that do not develop acute or chronic conditions, and therefore do not incur the escalating and substantial cost of treating those conditions.

The critical role of diagnostic imaging

To sweepingly claim that **all** new healthcare technology introductions can make a material difference to the cost and effectiveness of healthcare delivery would clearly be false. Various academic studies have robustly refuted such a notion.³ That is why well-governed healthcare systems systematically evaluate the efficiency of each innovation before deploying them. Certain categories of technology can, however, be broadly labeled as strategic contributors with clear return on investment in the new world of preventative medicine and streamlined acute and chronic treatment.

One such strategically beneficial technology category is that of diagnostic imaging.⁴ Investing in early, and more accurate, diagnosis is a fundamental tenet of the new style of healthcare. Early, effective diagnosis can radically reduce: lifetime chronic treatment costs; expensive invasive surgery and other procedures; and wasted therapies resulting from diagnostic errors or inaccuracies. Most importantly, it can save lives and create a more healthy society. The financial benefits alone that result from early, accurate diagnosis are widely recognized as far outweighing the cost of treating a lifetime of ill health.

To make diagnostic capabilities in the healthcare system as effective as possible, clinicians need to have access to up-to-date technology. There are exciting developments at the top end of the technology spectrum. Super-magnet imaging will have a particular impact on neurologic and oncological diagnosis and research.⁵ Smart software developments are also appearing on the market that, for instance, allow rapid setup change so that research imaging happens at night while therapeutic diagnostics operate through the same unit during daytime patient hours.⁶

The medical technology category is also at the forefront of the digitalization of healthcare technology.⁷ The availability of digital diagnostic **images**, within an institution, between institutions or – in the case of telemedicine – anywhere on the ground, is a major element of digital healthcare delivery. With access to this visual data and the insights it brings, clinicians can make earlier, better decisions, reduce unnecessary therapies and procedures, and save lives.

Updating – near-term objectives

Of course, healthcare organizations need to act within their specific budgetary requirements and restrictions. Nevertheless, they do at least require access to reasonably recent technological capabilities. Apart from the size of medical technology inventories, it is widely attested that equipment age and sophistication are also important because ultimately these factors underpin the quality of services⁸ and drive improved patient care. Modern computed tomography (CT), magnetic resonance imaging (MRI), positron emission tomography (PET)-nuclear medicine and angiography medical diagnostic imaging technologies improve the quality of healthcare services and offer many possibilities for rationalization of diagnostic facilities.

From an organizational point of view, having up-to-date equipment specification is also critical. In the **private** medical sector, healthcare organizations compete for patients and, within certain travelling distance limitations, technology capability is one of the key factors with which to attract patients and the income they bring with them. This consideration is also increasingly pertinent in the **public** healthcare arena. While reimbursement levels are set by the state, patient choice about where they are treated, with funds following the patient, is already a hallmark of public healthcare provision in Europe. Therefore, technological capabilities in these largely public healthcare systems are an increasingly important factor in attracting patients and reimbursement income. Where, therefore, does a healthcare system focus its first efforts in ensuring that its institutions have access to reasonably modern diagnostic imaging technology? Moreover, once the main area of focus has been identified, how can that technology acquisition be enabled and made sustainable?

The following sections of this short research note define the priority areas for diagnostic imaging technology investment, and then talk about the financing techniques that make this possible and transparent for the majority of healthcare organizations.

Focusing on urgent technology replacement

There is an international consensus that medical equipment over 10 years old is "in urgent need of replacement".⁹ Older medical equipment – especially in the diagnostics area – becomes expensive to maintain, fails more often and impairs a hospital's ability to deliver high-quality patient outcomes.¹⁰ As a result, this research note confines itself to simply the replacement of the 10+ year old technology in medical institutions that should be urgently replaced.

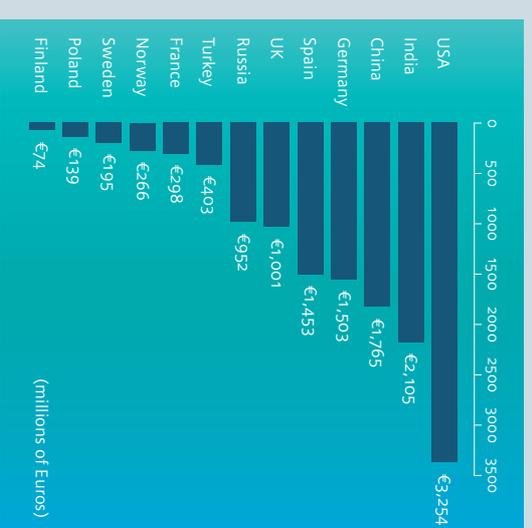
Research conducted by one national institute¹¹ helpfully encapsulates the dangers of continuing to use very out-of-date diagnostic imaging equipment. In summary, they are:

- Lower reliability
- Lower treatment success rates and more side effects
- Lack of access to new techniques
- Inability to scan as full a range of patient types
- Higher doses of radiation
- Lower diagnostic capability
- Slower throughput

Accordingly, Siemens Financial Services has commissioned independent research in 13 countries across the globe – in order to estimate the cost of replacing 10+ year-old diagnostic imaging equipment in each of these countries. This work builds on studies compiled in previous years by the European Coordination Committee of the Radiological, Electromedical and Healthcare IT Industry.¹² The estimates in this research confine themselves to current equipment implementation rates, even though many countries have low access to diagnostic imaging technology. If the cost of bringing access to diagnostic imaging up to the higher end of European standards were also considered, the resulting figures would be vastly greater.

Estimates for the cost of replacing 10+ year old diagnostic imaging equipment may be seen in the table below. Variations in the financial resources needed to complete this urgent replacement task are the product of several factors. The primary ones are: population; historical access to diagnostic imaging (devices per 1,000 of population); economic pressure on health systems that has encouraged historical lack of investment; and advised or regulated technology replacement guidelines/rules in each country.¹³

Cost to replace diagnostic imaging equipment over 10 years old



Sustainable financing techniques

Whatever the scale of the urgent replacement challenge in each country, all healthcare systems remain under progressively severe financial pressure. Therefore, sustainable and affordable ways have to be found to acquire the necessary technology. Recent research projects completed by SFS among healthcare CFOs in each of the countries mentioned above,¹⁴ have revealed an increasingly clear picture of how financial professionals in healthcare are meeting this kind of challenge. They are utilizing an increasingly diverse range of financing tools that are easy and flexible to arrange, that represent appropriate and transparent packages from specialist financiers that are expert, reliable and sustainable over the long-term planning horizons particular to healthcare. Each of these qualities is briefly described in the following pages.

“Our biggest pressure to invest comes from diagnostics, but IT is important to us too.”

CFO, Sweden

“We face the biggest pressure to invest in imaging technologies.”

CFO, France

Diverse

Healthcare CFOs are drawing on a wide range of financing sources and techniques to maximize their access to finance and to find the most appropriate financing solution for their particular needs. This contrasts with the former position where hospitals and clinics used to be primarily reliant on tax-derived capital budgets or traditional loans. Techniques cited by respondents cover asset finance, extended payment terms, pay-per-use, and more. Asset finance is the most widely used of these techniques today.

“You can lease practically anything ... and it can often be better value than buying from capital funds.”

CFO, Poland

“A diverse range of financing sources is what we have now built up, along with an imaginative approach to which is right for which of our needs ...”

CFO, France

“The main reason for us to use diverse funding methods is to manage risk and try to minimize the financial risks involved.”

CFO, China

Easy and flexible

Healthcare CFOs emphasize that applying for traditional loans can often be a long and bureaucratic process. Therefore, they have a growing requirement for financing techniques that are quick and straightforward to arrange. Such agile financing methods are increasingly valued by respondents as separate lines of finance, offering the flexibility to fit the hospital or clinic's precise needs, and allowing institutions to quickly and incrementally build their new-generation technology base.

“These alternative financing methods are hassle-free and less time-consuming than acquiring a bank loan.”

CFO, India

Expert, appropriate and transparent

Healthcare CFOs across a number of recent SFS studies also underlined the benefits of obtaining finance from expert financiers who understand both technology and sector applications and are able to offer customized packages that flex to fit the institution's particular circumstances and cash flow needs. CFOs note that these packages can be made comprehensive, embracing equipment acquisition, service, maintenance and even software upgrades. Moreover, these tailored financing packages make it easy for CFOs to understand total lifetime costs and therefore calculate a reliable cost-per-procedure – a significant advantage for transparent financial planning to guard against cost escalation.

“We worked with our current equipment financier, who is expert in medical technology, to create a hybrid financing arrangement – part loan, part lease, with staggered repayment level triggers – to make it affordable for us and to match our cash flow needs.”

CFO, USA

“We were looking to create a structured leasing facility for radiology equipment over a seven-year period, including the financing of an initial grace period for setup where we were not yet getting benefit from the technology.”

CFO, Turkey

“We find that specialist financiers offer more flexible and appropriate terms, and they are willing to combine the complete technological solutions (whichever vendors it comes from), and even offer an umbrella arrangement for future tech acquisition.”

CFO, Germany

Reliable and sustainable

Finally, healthcare CFOs note that finance providers specializing in healthcare tend to remain committed to serving the sector, even when economic circumstances tighten. This is important for the long-term planning characteristic of healthcare policy – knowing there is a reliable financing partner who will be prepared to finance technology needs over time, whose funding is not reliant on the cyclical waves of the capital markets, and who will not abandon the market when times get tough. Respondents also described the advantages of dealing with long-term, specialist financing partners who will create future-orientated arrangements that make it easier for healthcare organizations to embrace additional technology acquisitions without having to go through a separate, detailed financing application every time.

“Financing packages that offer flexible terms that really match our operating needs, along with stable reliable payment rates across the financing period, are hugely attractive and will become more so over the coming years.”

CFO, Russia

“Using financing tools to acquire at least a proportion of your medical technology also encourages a more strategic approach to asset management.”

CFO, UK

“We worked hard to access more stable financial arrangements that do not risk radical rate changes or the risk of foreclosure.”

CFO, Spain

Key references

- ¹ See, for instance: Office for National Statistics, ‘Expenditure on healthcare in the UK 2013’, 26 March 2015 and The World Bank, ‘Health Expenditure Total (% of GDP) 2014 and OECD Capital Expenditure in the Health sector’, 9 October 2015.
- ² See, for instance: Deloitte, Working differently to provide early diagnosis, 2013, which notes the disproportionately positive impact of advanced imaging technologies on long-term costs, noting ‘health services need to “develop a robust understanding of the value for money of existing diagnostic services and capture the real-time impact of new diagnostics on downstream costs”’. Corroborated by: MIT Technology Review, Dr. R. Lee and Dr. G. Davies, ‘Technology: The Cure for Rising Healthcare Costs’, 3 Sept. 2013; Hinchingsgrove NHS Trust, Business Case for the Replacement of the MRI Scanner, 11 March 2016, which notes a throughput increase resulting from technology replacement of 50%; ‘Use of medical imaging—CT, MR, ultrasound, or x-ray—in hospitals is associated with lower patient mortality: Study led by David Lee, Ph.D.’, Senior Director, Health Economics and Outcome Research at GE Health Care (2009); ‘Life expectancy increased more rapidly in states with increased utilization of advanced medical imaging: Study by Dr. Frank Lichtenberg, Ph.D., Columbia University’, ‘The Quality of Medical Care, Behavioral Risk Factors, and Longevity Growth’, Released through the National Bureau of Economic Research; Coronary CT imaging in the emergency room can save billions: Research by Dr. Harold Litt, Chief of cardiovascular imaging in the Radiology Dept. at the Perelman School of Medicine at the University of Pennsylvania, published in the New England Journal of Medicine (March 2012); ‘Early diagnosis of lung cancer: Cost-benefit analysis conducted by Millman, Inc. and published in the April 2012 edition of Health Affairs. The analysis was commissioned by The American Legacy Foundation and Lung Cancer Alliance after the National Cancer Institute announced the results of the National Lung Screening Trial (NLS7), which proved that low-dose CT screening could reduce lung cancer deaths by at least 20% in a high-risk population of current and former smokers ages 55 to 74; ‘Reduction in planned abdominal surgeries after CT scans’, Han H. AbuJudeh, ‘Abdominopelvic CT increases Diagnostic Certainty and Guides Management Decisions’, Aik196, February 2011; Reducing the negative appendectomy rate: ‘Effect of computed tomography of the appendix on treatment of patients and use of hospital resources’, Rao PM, Rhee JT, Mowelline RA, Mostafaei AA, McCabe CJ, New England Journal of Medicine, January 1998 Jan;338(3):141-6.
- ³ See, for instance: Phil Fasanio, Transforming Healthcare: The Financial Impact of Technology, Wiley, March 2013.
- ⁴ American College of Radiologists, Imaging 3.0 Case Study: A Targeted Approach, 2015; Center for Diagnostic Imaging, Miami, Mobile Diagnostic Imaging, 10 May 2016; GE Healthcare, Expanding MRI Imaging capacity through data-driven workflow optimization at Houston Methodist Wilbrook Hospital, 2014; SixSigma, C-Pexon, Applying Six-Sigma to Improve Diagnostic Imaging; Deloitte, Working differently to provide early diagnosis, 2013.
- ⁵ See, for instance: News Medical, New collaboration set to deliver innovative MRI research facility at Institute of Translational Medicine, 15 Sep 2016.
- ⁶ Ibid.
- ⁷ See, for instance: Bloomberg, The Digitization of Healthcare, 23 Feb 2012; A new era for the healthcare industry.
- ⁸ See, for instance: Fraser Institute, Old and Outdated Medical Equipment, May/June 2011; also Esmail, Nadeem, and Michael Walker, How Good is Canadian Health Care? An International Comparison of Health Care Systems, 2008 Report; Fraser Institute.
- ⁹ CQIR, Age Profile, 2014.
- ¹⁰ See for instance: European Society of Radiologists, ‘ESR takes action to encourage replacement of aging equipment’, 6 Mar 2015; Royal College of Radiologists, ‘CT Equipment, Operations, Capacity and Planning in the NHS’, June 2015; N. Esmail, M. Walker, Fraser Institute, Old and Outdated Medical Equipment, May/June 2011; N. Esmail, M. Walker, Fraser Institute, How Good is Canadian Health Care? An International Comparison of Health Care Systems November 2008.
- ¹¹ NHS Supply Chain, Why it is important that the NHS has access to the latest medical equipment, 2014.
- ¹² CQIR, Age Profile, 2014.
- ¹³ METHODOLOGY: In order to calculate the acquisition cost of replacing 10+ year-old diagnostic imaging equipment (based on an average viable equipment lifetime of seven years), predicted spending on diagnostic imaging equipment per country (sources: EpiScan, Forrester, et al) over that average equipment lifetime was combined with estimates by the relevant EU industry-governmental group (www.cocir.org) into the age of the diagnostic imaging equipment fleet, along with original research into the issue conducted in non-EU countries. These projections were then validated with a range of diagnostic imaging equipment vendors in each country.
- ¹⁴ Siemens Financial Services, Champions of Change, Sep 2015; SFS, Taking the Pulse, February 2016.

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