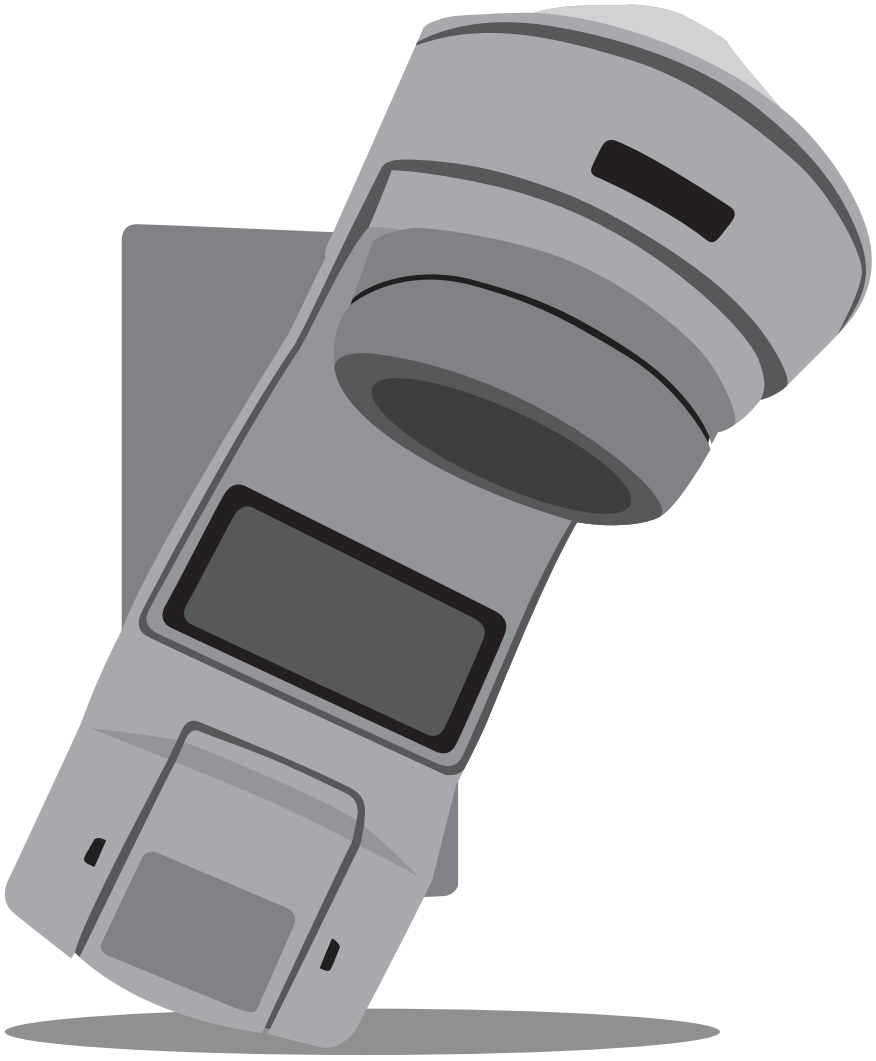
NHS Supply Chain

Why it is important that the NHS has access to the latest medical equipment



Background

Anecdotal evidence suggests that the NHS is failing to optimise the replacement and investment in new technology, which in turn undermines the ability to diagnose and treat patients safely and effectively. This is critical in the fields of medical imaging and radiotherapy where the latest scanners and radiotherapy treatment systems can have a tangible impact on patient experiences, diagnosis and treatment success.

As a result NHS Supply Chain commissioned a leading consultancy, York Health Economics Consortium, to carry out research into the clinical risks associated with the use of older imaging and radiotherapy medical equipment, the benefits of the latest technologies and the barriers inhibiting the timely investment in new equipment within the NHS.

Research methodology

The Consortium conducted a series of in-depth interviews with various key opinion leaders within the NHS, a broad survey of clinicians and other healthcare professionals including radiographers, radiologists and service managers. The study's aims were; to understand the clinical risks associated with the use of older imaging and radiotherapy medical equipment, investigate the benefits of the latest technologies and expose the barriers inhibiting the timely investment in new equipment.

Imaging and radiotherapy equipment – the basics

- CT stands for Computed Tomography. CT equipment produces x-rays which enable detailed images to be taken through a non-invasive examination of different parts of a patient's body. CT machines are a core piece of diagnostic equipment used within the NHS.
- MRI stands for Magnetic Resonance Imaging. MRI equipment uses powerful magnets to produce detailed images of different parts of a patient's body. MRI machines are a core piece of diagnostic equipment used within the NHS.
- LINAC stands for Linear Accelerators. These are radiotherapy treatment systems used to treat patients with cancer by delivering a high energy x-ray to a tumour.

Results

Risks

All participants were asked to identify the most important clinical risks arising from the use of older CT, MRI and LINAC equipment. A number were identified:

Lower reliability

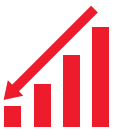
100% of respondents highlighted this as a risk associated with the use of older MRI scanners and 80% for CT equipment

Higher doses of radiation

84% of respondents identified this as a clinical risk associated with the use of older CT equipment

Lower treatment success rates and higher side effects

67% of respondents identified this as a risk associated with the use of older LINAC equipment



Lower diagnostic capability

90% of respondents identified this as a clinical risk associated with the use of older MRI scanners and 80% for CT equipment

Lack of access to new techniques

100% of respondents identified that older LINAC equipment does not enable the latest most effective forms of radiotherapy treatment

Slower throughput

100% of respondents highlighted this as a risk associated with the use of older MRI scanners and 76% for CT equipment

Inability to scan as full a range of patient types

100% of respondents highlighted this as a risk associated with the use of older MRI scanners and 84% for CT equipment

"Recent technology has resulted in the capability to employ a much lower radiation dose to get satisfactory results. To not have the most up-to-date scanner actually puts people at higher risk."

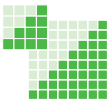
Survey respondent

Benefits

The Consortium also wanted to understand the views of the respondents to ascertain if they felt there was any advantage in using modern technology over old equipment. Participants were therefore asked to identify the most important benefits arising from use of the latest CT, MRI and LINAC equipment. The research highlighted that there are significant benefits to be gained from replacing older CT, MRI and LINAC machines for new equipment:

Improved patient experience

100% of respondents highlighted this as a benefit associated with the latest CT equipment and 90% for MRI scanners



Higher resolution imaging

90% of respondents highlighted this as a benefit associated with the latest MRI equipment and 76% for CT equipment

Reduced downtime and higher throughput

Over 76% of respondents highlighted this as a benefit associated with the latest CT and MRI equipment

Ability to carry out a wider range of treatment

78% of respondents highlighted this as a benefit associated with the latest LINAC equipment

Reduced patient side effects and recovery time

67% of respondents highlighted this as a benefit associated with the latest LINAC equipment

Higher treatment success rates

56% of respondents highlighted this as a benefit associated with the latest LINAC equipment

Improved patient radiation safety

56% of respondents highlighted this as a benefit associated with the latest LINAC equipment

"We replace with new equipment because of the technological advances that are constantly happening in the field. Every so often there is a step change in technology and you can be caught out with old equipment that can't actually provide what rapidly becomes the gold standard of treatment."

Survey respondent

Barriers

All participants were asked which barriers may prevent the timely replacement of CT, MRI and LINAC equipment. The study identified two key factors; **a lack of capital funds and lengthy complex business case approval processes.** Interviewees explained that trusts need to have robust long-term funded capital programmes to take advantage of new technologies. Long term replacement plans also enable the NHS to maximise savings through smarter more strategic procurement. As one key opinion leader explained **"equipment kept beyond its working life usually leads to a rapid and poor procurement process where money is wasted as trusts try to grab all options, as they only get one chance to replace kit."**

How old is too old?

In light of these findings, NHS Supply Chain led further work to understand the age of the CT, MRI and LINAC equipment in use within the NHS.

Equipment age is important as it is generally recommended that CT and MRI equipment should be replaced when it is seven years old and LINAC equipment when it is 10 years old. There is therefore a greater likelihood that the risks identified by the healthcare professionals surveyed will materialise if equipment is not replaced in line with these recommendations.

The NHS does not have a comprehensive register of its medical equipment and an understanding of 'who owns what' within trusts and treatment centres. To improve the healthcare community's level of understanding, NHS Supply Chain is working with the NHS to collate an extensive database of its' install base of CT, MRI and LINAC equipment in the NHS. Analysis of this data to date summarised in the diagram overleaf demonstrates that:

- There is equipment in operation within the NHS that is significantly older than the recommended useful life
- The average age of this equipment is approaching or over 70% of the equipment's recommended useful life
- Over £200m of investment is required to replace all CT and MRI equipment that is older than seven years, and over £90m of investment is required to replace all LINAC equipment older than 10 years
- The NHS is failing to adhere to the majority of the European Coordination Committee of the Radiological, Electromedical and Healthcare IT industry's (COCIR) [1]golden rules of procurement.

Unless equipment replacement is optimised to meet service needs, the NHS will be unable to access the latest technological advancements that provide greater diagnostic capability, enhanced treatment accuracy, improved patient safety and lower ownership costs.

[1] COCIR is a European Trade Association representing the medical imaging, health ICT and electromedical industries. They produced three golden rules to assist healthcare organisations gain the right mix of medical equipment across their install base. Golden rule one states that at least 60% of the installed equipment base should be younger than five years. Golden rule two states that not more than 30% should be between six-ten years old. Golden rule three states that not more than 10% of the age profile should be older than 10 years. With the exception of CT for golden rule three, the NHS is failing to adhere to these rules for CT, MRI and LINAC equipment.

How old is too old? (continued)

CT

Recommended useful life

1 2 3 4 5 6 **7** 8 9 10 11 12 13 14 15 16 17

Time line: 483 systems in the installed base

Average age: 4.9 years

Age of oldest: 13 years

No of Machines over seven years: **148**
Investment required: **£71.3m**

MRI

Recommended useful life

1 2 3 4 5 6 **7** 8 9 10 11 12 13 14 15 16 17

Time line: 380 systems in the installed base

Average age: 6.2 years

Age of oldest: 17 years

No of Machines over seven years: **181**
Investment required: **£144.4m**

LINAC

Recommended useful life

1 2 3 4 5 6 7 8 9 **10** 11 12 13 14 15 16 17 18

Time line: 311 systems in the installed base

Average age: 6.3 years

Age of oldest: 17 years

No of Machines over ten years: **46**
Investment required: **£92m**

Data: NHS Supply Chain Dec 2014

Conclusion

A number of key themes emerge from the research findings. Firstly, there is a consensus amongst the healthcare professionals interviewed and surveyed that there are clear risks associated with the use of older CT, MRI and LINAC equipment. It is also evident that the latest medical equipment technologies are capable of delivering a range of clinical and service benefits.

Analysis of the CT, MRI and LINAC equipment within the NHS reveals that the NHS has equipment which is older than the recommended replacement age, and does not fully adhere to equipment replacement guidance. The research also provides a number of factors that may explain this and these include financial barriers and complexities in the business case approval process.

Our overriding conclusion is that the NHS requires financially sustainable medical equipment replacement and investment plans. The hallmarks of this include:

- Clear alignment of equipment needs with clinical strategies
- A long term, multi-year approach
- Financial sustainability through a robust funding strategy
- Evidence based decision making to identify investment priorities
- Compliant and effective procurement processes.

Further information

For further information on these findings or to get a copy of the full report please contact Paul.Turton@supplychain.nhs.uk

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