REMOTE HEALTH MANAGEMENT
REDUCING BED BLOCKING IN THE NHS

Institution of MECHANICAL ENGINEERS

The NHS's capacity is stretched. This pressure is partly due to the rise in frail and ageing patients who cannot be discharged from acute hospitals. Despite the Department of Health (DH) providing an extra £3.5bn by 2019–20 to enable more patients to leave hospital on time[1], 62% of hospital bed days remain occupied by the over 65s.

The National Audit Office estimated delayed transfer or so-called 'bed blocking' cost the NHS £820m in 2015[2]. While September 2016 saw one of the highest recorded monthly delays in patient transfers since records began in 2010 (the equivalent of 196,246 'delay days' according to NHS England figures)[3,4].

Remote Health Management (RHM) could ease the pressures of bed blocking and support care initiatives for patients outside hospital. However, market growth of incipient RHM systems, such as tele-health and tele-care, remains slow. This is due to a lack of engagement by senior clinical staff; poor public understanding; limited resources and funding; and the lack of successful integration to date with other healthcare systems[5]. RHM technologies can support people to lead healthy and dignified lives into old age, saving money for themselves, the taxpayer and freeing up critical NHS resources for other people in need.

To gain the most benefit from RHM, the Institution of Mechanical Engineers recommends:

1. **Improving public awareness:** The DH should create a programme of national public awareness to encourage acceptance of RHM technology and home-based services provided by the NHS, before the end of the 'Personalised Health and Care 2020' initiative.

2. **Changing culture with existing workforce:** The NHS should draw upon its existing workforce of biomedical engineers to implement change and increase engagement in RHM systems throughout its services. It should carry out a feasibility study before the end of the Five Year Forward Plan to set targets for cost savings that could be made.

3. **Creating a national RHM network:** The DH must commit to a strategy for creating an RHM network to integrate acute and social care sectors by 2020. This needs to ensure implementation of RHM systems is undertaken across both sectors by 2022 at the latest. A key element will be standardisation of RHM technology that enables patient data to be accessed anywhere in the hospital and social care network.

4. **Simplifying funding routes and initiatives:** The Government must ring-fence some of the £20–£30m identified in the Accelerated Access Review, specifically for developing RHM systems. It should also simplify the routes to funding sources for healthcare technology and create a single pathway to funding. Government also needs to focus funding on schemes like the NHS Test Bed programme which optimises the use of different types of technology.

Improving the world through engineering

REMOTE HEALTH MANAGEMENT: REDUCING BED BLOCKING IN THE NHS

THE COST OF GETTING OLD

Older patients are more intensive users of hospital and long term care services, and are more likely to have a number of long-term chronic conditions (LTCC). Research shows that 10% of people aged over 75 are likely to use both hospital and long term social care in the same year[6].

Some frail patients can quickly return to hospital, particularly if they have been discharged prematurely. There has been an average 2.6% increase year on year in readmission of frail patients within 30 days of discharge, since 2001/02[3,7,8]. In 2014, the National Audit Office found that the one million emergency readmissions cost the NHS an estimated £2.4bn a year. However, a patient who can be appropriately cared for outside the hospital environment such as in a nursing or residential home, or with additional support in their own home, offers a less costly treatment path than those who are forced to remain in hospital. In 2015 an NHS bed cost an average £1,925 per week, compared to a residential care home at £558 per week or £357 for care at home[9].

Furthermore, the clinical risks to patients remaining in an acute hospital, when medically ready to be discharged, are often higher than if they are able to go home. They include lethal hospital-acquired infection, pressure sores, and 5% loss of muscle strength per day in bed.

DELAYING DISCHARGE: A RISK TO PATIENT HEALTH

Many Emergency Departments in acute hospitals are no longer meeting their four hour admission targets due in part to blocked beds[10,11]. As the number of patients with LTCC continues to rise, so will the number of costly re-hospitalisations, preventing admission of other acute patients. At current rates of growth, it is estimated that LTCC will cost £5bn a year by 2018. This influx of repeat patient attendance is unsustainable and is a risk to patient health[12,13]. Discharge planners find themselves under increasing pressure to mitigate risk caused by premature discharge, often with little observational data on which to base critical decisions. The lack of patient assessment and poor cross-departmental communication (particularly sharing information between acute and social care providers), compounded by inadequately funded residential or long-term care facilities, are key reasons for the delayed discharge of older patients[14,15].

To reduce readmissions, healthcare providers need to recognise that patients are never fully discharged; rather they move between levels of being an acutely unwell inpatient; to a recovering inpatient; to a home patient, and eventually home independent. Improving the flow and visibility of patient information and medical data should change the speed and ease with which the patient moves through these stages. However, data must be gathered from many sources, taking account of clinical needs and the preferences of not just the patient, but their families and health care workers as well.

REMOTE HEALTH MANAGEMENT: CONNECTING CARE NATIONWIDE

RHM systems have been available since the 1960s but have only come into their own in the last couple of decades with widespread wireless networking and digital connectivity. There are currently over 100,000 mobile health apps available via smartphones and about 75% of the UK population goes online for health information.

RHM allows clinicians to access real-time data from the patient, such as physiological trend analysis and early detection of patient deterioration. It allows the focus to move from treatment to prevention. There is a growing need for more advanced levels of connectivity of this kind, particularly to overcome the traditional "black hole" of care that occurs in the period between initial hospital discharge and a patient's first follow-up clinical appointment.

Currently, mobile and digital health technologies such as wearable devices and smartphone apps, are used mainly by those who are fit and well, for their own health surveillance, rather than by health care providers of ageing and frail patients[16]. Yet among healthcare professionals, 89% agree that better integrated care could improve the health of the UK's population, and 77% believe it would reduce NHS costs[17]. The Good Governance Institute estimates that savings from the widespread use of RHM and advances in sensor and network technologies could save the NHS up to £1.2bn over five years[5]. However the adoption of these systems, particularly in social care settings, has been mixed at best[18,19].

Government has tried previously to drive adoption of RHM systems, such as the Whole System Demonstrator (WSD) in 2008 and '3millionlives' campaign in 2012. Where uptake of RHM systems has taken place under these schemes, local councils, Clinical Commissioning Groups (CCG) and trusts have shown significant improvements in rehospitalisation and LTCC. Yet many of these schemes have been discontinued or rebranded[5]. There seems to be a lack of confidence in their ability to achieve long-term results. There is certainly no discernible long-term strategy to implement an NHS-wide RHM system.

The Institution recommends a unified plan to engage all stakeholders to ensure a nation-wide RHM network is created. DH must commit to a strategy for creating an RHM network to integrate acute and social care sectors by 2020. This needs to ensure implementation of RHM systems is undertaken across both sectors by 2022 at the latest. A key element will be standardisation of RHM technology that enables patient data to be accessed anywhere in the hospital and social care network.

PATIENT-CENTRIC CARE & CHANGING PERCEPTIONS

The Government's framework document 'Personalised Health and Care 2020[20], recognised that "better use of technology and data is a prerequisite for supporting and enabling the key developments needed to reshape the health and care system". In its present form the UK patient experience is conveyed through multiple clinical and social care departments. These often have conflicting incentives and deliverables with little to no integration of technology between them. The focus is on short term financial and patient targets, rather than patient priorities and LTCC management, and results in fragmented and often temporary successes for both patient and clinician[21,22].

People living with LTCC account for 70% of the money spent on health and social care but more than 99% of the time they manage their conditions themselves. Today's patients are relatively well informed about technology and often want to be engaged in decisions and processes regarding their treatment. Indeed, several organisations have recommended that digital technology can and should put diagnosis and management of healthcare more firmly into the hands of patients themselves[23]. RHM is one way of enabling patients to gain such involvement[24,25]. Where older people have had an opportunity to engage with RHM systems they have reported high satisfaction and improved perception about the quality and safety of care that they received[26]. Nonetheless, if RHM is to become an integrated part of the long-term care of older people, then patients and their caregivers must be fully engaged in managing the technology and be receptive to following care plans.

New models of care such as 'supported self-care' and home-based services offer significant opportunities to the NHS in improving patient discharge times[21, 25,26]. A three-year study by NHS Liverpool Clinical Commissioning Group (CCG) and Philips plc, showed that tele-health reduced emergency admissions by 22% to 32% for patients with above-average risk and more than 90% of patients felt more in control of their conditions. This outcome encouraged the Liverpool CCG to include tele-health as part of its routine social care packages[27].

The med tech industry however must continue to create and deliver RHM systems for which the clinical application has been well researched and which the patient has been actively involved in developing. They must address patient's concerns related to the privacy and security of data and continue to work with NHS clinicians, social care providers and patients to ensure patient perceptions are addressed, through education and ongoing aftercare support.

The Institution therefore advocates greater emphasis on patient-centred care for older people with LTCC and believes that a programme of public awareness of RHM technology is required nationwide. The DH should incentivise public/private partnerships, like the Liverpool CCG and Philips, before the end of the Personalised Health and Care 2020 initiative. This engages the med tech industry to address society's knowledge gaps and enable patients to make informed decisions about their care and address perceptions of RHM technology.

INVESTING OUR MONEY WISELY

It is predicted that the UK will have nearly 9% (£3.9bn) of the global digital health market by 2018[18] and as the role of RHM expands, there is great potential for future growth in the UK market. Clinicians are continually seeking technology that will provide patients with high-quality social care to enable them to manage their conditions safely. It therefore falls to the engineering community to find solutions that enable the NHS to do more with less. The key to this is funding for both the development and implementation of appropriate technology such as RHM. The NHS Test Bed programme[28] which began in 2015/16 has already shown that enabling industry to directly address specific healthcare issues, such as LTCC, can accelerate the introduction of new technology[29]. However, there are numerous funding streams which are complex to access for many businesses and benefit only a small number of innovations at a time.

Consolidating the Coffers

There are increasing opportunities for public organisations and venture capital investors to embrace healthcare technology and innovation, for example the Institution of Mechanical Engineers' Stephenson Fund[30]. However, the larger Government and NHS-managed funding programmes remain central to facilitating rapid integration of technology at scale.

The Government's Accelerated Access Review (AAR), for example identifies how access to devices and diagnostic systems might be speeded up, based on patient need. The AAR proposes a ring-fenced fund of £20–£30m over 5 years to support the development of technologies that will 'significantly change care pathways' and have the potential to improve efficiency. Disappointingly only 5–10 products will be selected each year to receive this funding. The Institution recommends that Government reserves a portion of this fund for projects which specifically address the issue of bed blocking and re-admission.

Other programmes such as the NHS and Academic Health Science Networks (AHSNs) 'Innovation Accelerator', early-stage funding from the National Institute for Health Research (NIHR) as well as initiatives such as Innovate UK's 'delivering assisted living lifestyles at scale' (DALLAS) and 'Long-term Care Revolution' seemingly provide a plethora of funding opportunities. But each has its own application process, with limited or little guarantee of funding; a costly and time-consuming process for most healthcare technology companies.

The Institution therefore recommends that the Government dispenses with the multiple application routes to its own funding sources and instead creates a single pathway to funding initiatives. It also recommends that Government focuses on 'at the coalface' issues where private industry can work directly with the NHS such as the NHS Test Bed programme. The expansion of this programme would enable the NHS to assess a greater number of solutions and combinations of technology more rapidly and at scale.

Redirecting the flow

The Care after Cure report[31] proposed a 'Fast Track Discharge Fund', worth more than £3bn over the next five years, funded out of existing NHS budgets with the same money that would have been used for the patients' in-hospital care. This would be used to pay both for residential care beds to accommodate patients with no immediate clinical needs, and to invest in skills, training and facilities within the residential care sector. The Institution believes that expanding this proposal further, to include patients capable of returning home, would ease the pressure on NHS acute care.

FROM CULTURAL CONFLICT TO CONSENSUS

108 CCGs commissioned RHM systems in 2013/14, spending around £15.2m in total across the year. Of those, a disappointing 28% reported problems with implementation, including lack of staff training, the way in which systems were introduced, and disruption to existing processes[5].

Whilst recent studies on the performance of RHM systems, such as tele-health and care, have been shown to be extremely successful[5]; particularly the Technology Enhanced Care Systems (TECS) programme, there is still a perception from many healthcare professionals that the technology is flawed and brings minimal benefit to patients. This perception leads to a lack of commitment from senior clinical staff and poor implementation of RHM schemes.

As the UK demography ages over the coming years, changes in clinical and social organisational strategy will be a significant challenge to the NHS[32]. If it is to successfully implement RHM and reduce bed blocking as reflected by its 'Better Care Fund' and Five Year Forward Plan commitments, then it will require a collective culture change across the whole health and care sector.

Discharge decision-making and patient LTCC data interpretation, lends itself to engineering expertise. The NHS should look to its existing workforce of Allied Health Professionals, Clinical and Biomedical Engineers to start this cultural change. Their training and skills provide them with many of the competencies needed to implement RHM systems and expedite the complex process of patient discharge. Engineers should be empowered to lead on some of the complex, technological changes needed across the NHS to redesign services with both patient and process in mind

The Institution therefore proposes the NHS should draw upon its existing workforce to implement change and engagement in RHM systems throughout its services. The mobilisation of these biomedical engineers would go some way to addressing the NHS's care and quality, funding and efficiency gaps. The Institution calls for the NHS to carry out a feasibility study before the end of the Five Year Forward Plan to set targets for the cost savings that could be made in this way.

RECOMMENDATIONS

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