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WEARABLES AND HEALTHCARE

Are we just suckers for the latest gadget or is this trend representative of an increase in levels of patient activation?

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WEARABLES AND HEALTHCARE

Top UK health officials recently advised that the nation needs to go on a diet as part of a drive to cut calorie intake by 20% by 2024. But can the gadgets that many of us sport help to save us and the NHS before it's too late?

Looking around the office I can see numerous Fitbits and a handful of Apple Watches all monitoring and relaying colleagues' health-related data. You may yourself have overheard conversations about 'numbers of steps' or 'calories burned today'. Hardly surprising given that a recent survey showed that more than 8 million people in the UK are now users of some form of health-related technology.[1]

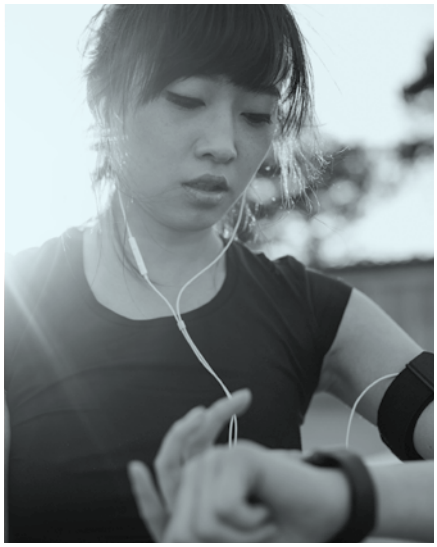
But what place do wearables have in the broader context of healthcare?

Can we exploit their undeniable attraction if they are put in the hands of *patients* as opposed to *consumers*? Can they improve wellness and prevent illness?

more than

8m

people in the UK are now users of some form of health-related technology[1]



What purpose do they serve?

At a time when both the average age and the proportion of older people are increasing, the creaking of the NHS is practically audible. These issues are compounded by the relatively riskier lifestyle choices made by younger generations.

Millenials – the birth cohort born between 1980 and 1995 – are giving up smoking at a lower rate than other generations, drink less often but drink more heavily when indulging, are losing their virginity earlier and having sex with more people, and are probably going to be the first generation in England where over half of the population are overweight while in their mid-twenties.[2]

Factors such as these, among others, have increased the prevalence of chronic diseases, which account for around 70% of the health service budget.[3,4]

To ensure the sustainability of the NHS (read as: save billions of pounds per year), the approach taken in healthcare has fundamentally shifted from one of treatment to one of prevention, as was made abundantly clear within the NHS Five Year Forward View.[4]

Instrumental in this approach is the concept of *patient activation,* which involves improving the knowledge, skills, and confidence a person has in managing their own health and healthcare.[5] It appears that levels of patient activation may already be on the up, with studies showing that there has been a dramatic increase in the number of patients – now approaching 70% – who speak to healthcare providers more regularly, actively research aspects of their own healthcare, and join patient portals.[6]

So patients are investing more time in putting themselves in a more informed position when it comes to their own health and wellbeing – that much we know – but how are wearables tapping into this shift?

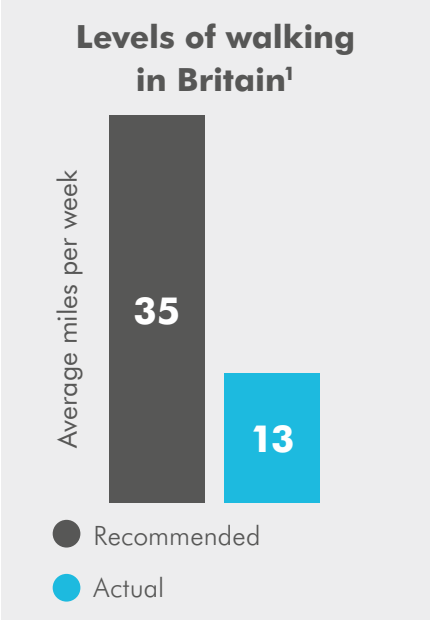
Increase in levels of patient activation[6]

Almost **70%** of patients

- speak to healthcare providers more regularly
- actively research aspects of their own healthcare
- join patient portals

Wearables are not just fancy pedometers

Currently, the average Briton walks a mere 13 miles per week, which is barely a third of the recommended 35 miles a week; 35 miles equates to 70,000 steps for those who measure distances in steps nowadays.[1]



Most wearables will provide you with instant data on your step count and to those with a vested interest in activity levels, this has been shown to be a motivating factor that increases levels of fitness. Interestingly however, this type of wearable has not yet been shown to affect health overall.[7]

Beyond acting as a sort of digital personal trainer, encouraging behavioural change and thereby modest improvements in overall fitness, it is the potential for the implementation of **telehealth** where wearable technology is touted to be most successful in affecting broader health outcomes. With the wearables market set to grow exponentially, it will be those associated with healthcare, as opposed to fitness, which take the lion's share.

Wearables are being developed that combine sensors to unobtrusively monitor motion, biometric, and environmental data that translate into clinically meaningful parameters, including, but not limited to:

- **activity recognition**
- **falls detection**
- **physiological sensing of heart rate**
- **respiratory rate**
- **blood pressure**

They not only provide instant information to those people involved in a patient's care, they also generate large amounts of data over periods of time, which can then be analysed to identify trends.

The value of this data in terms of healthcare is starting to gain recognition. **Big data** is a term that describes incredibly large data sets. In the context of the NHS, making efficient and informed use of this data is thought to have the potential to positively affect health outcomes for patients and economic outcomes for the healthcare system. This can be done on a longitudinal basis for an individual patient, or on a larger scale by analysing masses of pooled historic healthcare data.

The outputs of this process are predictive algorithms that reliably map the likely touchpoints and foreseeable complications for those patients with chronic diseases, allowing for proactive interventions that **prevent rather than treat**.

A shining example of data hard at work in healthcare comes from north of the border in Scotland. As early as 2001, the value of informatics technology was recognised and put to work in order to provide an integrated care model for patients with diabetes (SCI-diabetes). This resulted in a 40% fall in major amputations and a 30% fall in total amputations; extrapolated to the UK as a whole this could lead to a saving of £37 million per year from reduced amputations alone.[8]

£6bn

potential saving to the NHS afforded by informatics[8]

So impressive was the success of SCI-diabetes, the Scottish Government in collaboration with various stakeholders including MSD Healthcare Services, decided to unlock the data potential of the entire nation's comprehensive primary care records via the Scottish Primary Care Information Resource (SPIRE); this went live on 7 March 2018.

Informatics, as applied to the NHS generally, has been estimated to have the potential to save the NHS up to £6 billion per year.[8]

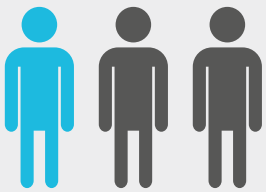
Wearables will undoubtedly play an increasingly large role in the generation of data to feed into such systems.

So what's the problem?

As we've seen, wearables are encouraging positive behaviour change on an individual basis, and also have the potential to feed data into systems of analysis that improve health outcomes more generally. So why are we not embracing their use more?

From the perspective of the doctors who would perhaps be expected to be proponents of wearables as a means by which to improve health, their concerns have been noted to include the consistency and accuracy of the data, the lack of a means by which to integrate the data into existing healthcare systems, and a lack of time and skills necessary to interpret results accurately. As such, only around a third of doctors volunteered themselves as being confident in recommending wearable tech devices to their patients.[9]

Confidence in wearables[9]



Only one in three doctors are confident in recommending wearables to patients

To the patients who would be the end user of such wearable devices, data privacy is an understandable concern, tied with the fact that a lot of the older generation of patients are relatively naïve to the requisite technology.

Moreover, with the arrival of the General Data Protection Regulation (GDPR) further restrictions on the flow of clinical information will surely follow and this will necessitate careful consideration of data governance arrangements within the NHS.

What is the prognosis?

As more and more ingenious methods of employing wearables to aid in various aspects of healthcare come to the fore, their convenience and consumer pull is undeniable.

In order to leverage health benefit through full integration into the healthcare system, significant investment in time, technology, systems, awareness campaigns, education and training will be necessary over the coming years.

That said, the potential benefits to the NHS and the contemporary and future wellbeing of a more health conscious, physically active, and activated nation are surely worth it.

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Michael is a trained biomedical scientist who went on to read medicine at Durham University.

Choosing not to pursue a career in medicine, Michael began working in medical writing; first in medical information and, upon joining IGNIFI, medical copywriting.

Michael draws on first-hand clinical experience and ongoing research to explore issues facing patients, the pharmaceutical industry and the healthcare sector.