TECH TONIC

The course of innovation has rarely run smooth. The 15th century Benedictine monk, Trimethius, was sceptical about the value of Johannes Gutenberg's printing press: parchment lasted longer than paper, and monks, he claimed, were less likely to make transcribing errors than machines. More recent inventions such as the motorcar, the telephone and the iPhone received cool initial receptions — Western Union turned down Alexander Graham Bell and Gardiner Hubbard's offer to sell them their patent, and the iPhone, was described as 'a luxury bauble that will appeal to a few gadget freaks'.

Healthcare technologies produce a range of interesting responses, too. At one end of the spectrum of opinion you can hear the sea water lapping around Canute's sandals, while at the other there is an unshakeable belief that there is nothing wrong with healthcare, or with the human condition, that technology can't put right. In their editorial, stimulated by the withdrawal of the Natural Cycles fertility app, Lara Shemtob and Rebecca Littlewood comment that the NHS is struggling to keep up with new healthcare technologies: 'drowning in a sea of innovation'.

Given the heterogeneity of technologies and the diversity of opinion, it might be helpful to think about four general categories of technology that have different implications for their use in healthcare, as well as for evaluation: administration, backup, communications, and diagnosis.

Administration refers to 'back office' functions such as information management, document retrieval and storage, scheduling, timetabling, procurement, and audit. Automation in this area is likely to progress relentlessly, and without the need for evaluation at every step. Backup technologies are those which support activities that are part of current practice by making them routine, and safety proofing them. This includes automated telephone/text reminders for appointments, follow-up, screening appointments, prescriptions, and investigations. This could be extended to bespoke, systematised safety-netting for patients with undiagnosed but persistent symptoms, or database analysis with machine learning to identify at risk groups for example, frail older people and patients at high cancer or cardiovascular risk.

These technologies are already being used

and need to be disseminated as examples of good practice.

Communications technologies relate to access, doctor-patient communication and interprofessional communications. They include telephone triage and consultation, e-consultations, video and other remote, non-face-to-face consultations, GP-specialist consultations, and the use of ITC to create and work with virtual groups, such as multidisciplinary teams, patient groups, and teaching groups. Many of these innovations are in daily use, and some are the subject of scrutiny and evaluation.

Coming to the theme of this issue of the *BJGP*, diagnostic technologies may hold the most allure, but are also the most elusive. Computerised decision support, as described in Summerton and Cansdale's editorial, has the potential to correct some of the biases, heuristics and oversights inherent in human decision-making, but the best way to incorporate it into the consultation is yet to be determined. Co-consultation with a doctor and a co-bot listening in and giving a guiding nudge when a possible diagnosis of Addison's disease has been overlooked, perhaps? Sarah Price and colleagues' finding that only one in five practices makes use of computerised risk assessment tools for cancer suggests that we may be some way away from this scenario. The holy grail — fool-proof, AI-based remote, autonomous diagnosis — is further away still. The papers on inflammatory markers by Jessica Watson and colleagues and the importance of the 'clinical gestalt' described by Ariella Dale and colleagues serve as reminders of the complexity of the diagnostic process. Louise Hall and colleagues report on the effect of GP burnout on patient safety: the computer may not get exhausted, but you have to wonder about the Maslach Inventory scores of doctors doing remote video consultations with patients that they do not know and will never see again.

Finally, read *Machines Like Me* and be entertained and slightly worried; Adam might possibly make a good doctor, but I doubt he'd agree to take the Hippocratic Oath.

Roger Jones,
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