

# Navigating the electronic health record in university education: helping health care professionals of the future prepare for 21st century practice

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Traditionally, many undergraduate health-care students are taught that ‘80% of the diagnosis is in the history’,<sup>1</sup> and that to formulate a plan, they should take a history, examine the patient and make a working diagnosis. In reality, many clues to diagnosis and management may already be in the electronic health record (EHR). In primary care, reception staff usually indicate the presenting problem in the electronic appointment log, and may have uploaded photographs from the patient using tools that became popular during the covid pandemic, such as ‘accuRx’.<sup>2</sup>

Clinicians, especially in primary care, often use information in the EHR to build a preliminary diagnosis and management plan before even seeing a patient. Looking at information in a patient’s EHR, provided by reception staff, clinicians or by patients themselves, represents an important part of the data gathering process. We need to be aware of the risks of confirmation bias,<sup>3</sup> but while a history and examination are often essential to clarify, confirm or refute such preliminary diagnoses, they often prove to be correct.

Despite the EHR’s importance, relatively little attention is paid to how to best use this valuable resource in many healthcare professional (HCP) undergraduate curricula or postgraduate training programmes. Education has not kept pace with digital innovation in the National Health Service (NHS) and needs to align with the ways technologies are used in practice. The Topol review<sup>4</sup> identified that the NHS ‘needs to make sure that the education and training for future staff equips them with their full potential in the technology enhanced NHS’. The capture of high-quality data by all HCPs will enable better patient outcomes and improved use of real-world data for prognostic modelling,

personalised medicine, patient-centred care and more targeted recruitment of patients to clinical trials.

Learning how to interpret and enter data into the EHR are essential skills, and navigating poorly developed EHRs can be a cause of work-related stress and burnout.<sup>5</sup> New challenges are emerging; NHS England have announced plans for all adult patients in England to have online access to all new information entered into their primary care record.<sup>6</sup> With the increasing digitisation of hospital records,<sup>7</sup> this is also likely to happen in secondary care. Tomorrow’s HCPs need to know how to write in the EHR in a way that will benefit their colleagues and be medico-legally sound and will also now need to cater for a patient audience. This will also apply to hospital discharge letters, letters between specialties and comments added to test results.

These challenges are being addressed through our ongoing pedagogical research at The University of Manchester. We are working alongside patients, clinicians, educators and service providers to understand how electronic records can serve multiple functions and cater to multiple audiences.<sup>8</sup> A national working group (led by KW) defined domains of competencies relating to the use of EHRs<sup>9</sup> and highlighted that future HCPs need to develop competencies to access data, generate data, communicate and work with other HCPs in the context of technology. Inclusion of an authentic EHR in undergraduate healthcare education is necessary to develop these competencies, since access to real-world systems is variable, often with only ‘observer’ permissions during placements. We are exploring using patient-donated primary care records in collaboration with systems



providers to ensure students can interact with genuine records rather than the overly simplistic synthetic records commonly in use.

We aim to develop and deliver a programme of teaching related to digital skills and literacy, building on our research and expertise in digital health and are exploring options to expand the EHR-related competencies of the GP training curriculum. We recognise the importance of developing such skills regardless of professional identity, and that using digital technologies requires multidisciplinary working to bring about effective digital collaboration and communication. Investigating the pedagogical approaches being used to integrate EHRs into curricula and their outcomes shows that teaching alongside EHRs positively impacts student confidence, preparedness for clinical practice and improved communications skills.<sup>10</sup>

We believe that such work will not only equip students and clinicians to put data in the record to better use and write entries benefiting their colleagues and patients, but also inspire them to consider how electronic medical records and systems could evolve in the future beyond their current functions to become a collaborative tool to enhance and encourage better patient-centred care.

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#### REFERENCES

- 1 Cooke G. A is for aphorism - is it true that "A careful history will lead to the diagnosis 80% of the time"? *Aust Fam Physician* 2012;41:534.
- 2 AccuRx. Where patients and healthcare teams communicate. Available: [www accurx.com/](http://www accurx.com/) [Accessed 6 Feb 2023].
- 3 Nickerson RS. Confirmation bias: a ubiquitous phenomenon in many guises. *Review of General Psychology* 1998;2:175-220.
- 4 Topol E. The topol review: preparing the healthcare workforce to deliver the digital future. 2019. Available: <https://topol.hee.nhs.uk/> [Accessed 31 Oct 2022].
- 5 Li C, Parpia C, Sriharan A, et al. Electronic medical record-related burnout in healthcare providers: a scoping review of outcomes and interventions. *BMJ Open* 2022;12:e060865.
- 6 Access to the patient record through the NHS app. 2022. Available: <https://digital.nhs.uk/services/nhs-app/nhs-app-guidance-for-gp-practices/guidance-on-nhs-app-features/accelerating-patient-access-to-their-record> [Accessed 31 Oct 2022].
- 7 Introducing the GM care record. 2022. Available: <https://gmwearebettertogether.com/> [Accessed 31 Oct 2022].
- 8 InPact - increasing patient activation by encouraging and enhancing online records access in primary care. 2022. Available: <https://fundingawards.nihr.ac.uk/award/NIHR300887> [Accessed 31 Oct 2022].
- 9 Pontefract SK, Wilson K. Using electronic patient records: defining learning outcomes for undergraduate education. *BMC Med Educ* 2019;19:30.
- 10 Vlashyn OO, Adeoye-Olatunde OA, Illingworth Plake KS, et al. Pharmacy students' perspectives on the initial implementation of a teaching electronic medical record: results from a mixed-methods assessment. *BMC Med Educ* 2020;20:187.