

Chapter 2

Electronic Patient Records

Introduction

Healthcare professionals should maintain records of the patient care activities that they perform. While traditionally this has been a requirement from a medicolegal perspective, it is recognised that good record keeping supports evidence-based healthcare and facilitates audit and quality monitoring, which has become of increasing significance in many healthcare economies.

Over the last three decades, the use of patient medication record (PMR) systems by pharmacists in both hospitals and the community has become universal, and pharmacy professionals are familiar with the use of computerised records to support the dispensing process and provision of advice on medicines in their sphere of practice. However, in both primary care and secondary care, new pharmacy services and innovative ways of working are being developed, which require real-time access to electronic medical records for clinical decision making.

Quality of care and cost benefit monitoring is a pressing need in large economies, where there are considerable public health needs, and where the healthcare system is insurance-based, such as the United States. In recent years, with the increasing use of information technology to support patient records, there has been a focus on standard data recording as a means of facilitating consistency of care across a range of professional settings.

Furthermore, an increasingly multi-disciplinary approach to healthcare demands the use of patient records that are shared between different healthcare professionals. Electronic health record (EHR) systems enable this to happen.

However, electronic patient records contain sensitive, personal information about a patient's medical conditions and treatment, and this information is used to make important treatment decisions. In addition, electronic records have the capacity to be disseminated or accessed from different locations. For these reasons, the security and accessibility of the record are important issues in the development and use of electronic patient records, as is the question of who can or should contribute to the record and how they are identified.

This chapter will explore the development of electronic health records (EHRs) in general, discuss the legal and design issues with EHRs, and describe how EHRs are used in pharmacy practice and how they can support other systems, and enable new initiatives in the profession. It will discuss issues such as access and sharing EHRs, subject (patient) access to records, specific record systems in the United States and United Kingdom, benefits of EHRs and how they might support pharmaceutical care.

Development of Electronic Patient Records

As discussed previously, the ability for healthcare professionals to store and retrieve electronic patient records has developed with the availability of solid state technology and computers that were small enough to be used in the office or clinical environment. Developments in communications and networking technology enabled electronic patient records to be shared within an enterprise – one particular hospital or healthcare provider – and this is commonplace today, in all major world economies. The use of enterprise-wide patient record systems enables a common subset of patient data to be used in all wards, clinics and departments of the provider organisation. However, the patient data available from the enterprise EHR or patient administration system (PAS) may be limited. It will only include patient demographic details (patient name, address, hospital/provider/insurance number etc) and no detailed information on clinical care. Consequently, it is common for enterprise EHR systems to be used as a feed of patient information for clinical or departmental systems which offer richer and more detailed functions – for example, e-prescribing, clinical decision support, clinical workflow and departmental management functions – but across a more limited domain. For example, in hospital pharmacies, many hospital pharmacy management systems have gained their feed of patient data from the enterprise PAS, and have used this to support specific pharmacy functionality such as labelling, decision support for drug interactions etc, pharmacy interventions, manufacturing worksheets etc.

In some situations, a rich medical record with details of diagnoses, medical history, clinical and treatment notes and care plan, will be available to health professionals in provider institutions across a geographical area, using a server and networked workstations. This is the case, for example, with US health maintenance organisation (HMO) records, such as Kaiser Permanente. Regional systems have been successfully developed in Sweden [1] and Italy [2], and the UK NHS IT initiatives have developed care records services in the UK. However, there are various political, professional and technical issues which can make the development of national centralised records services a slow process.

In addition to patient records on enterprise-based PAS and clinical systems, and national or regional centralised systems, there are also various private commercial providers of medical records software. The emphasis with these is that the individual, rather than the care provider or the state, takes ownership of, and

responsibility for, the patient record, and this approach is being endorsed by some governments. Two such commercial EHR solutions are Google Health and MicroSoft Health Vault.

Legal and Professional Framework for EHRs

There are three important concepts in law (legal issues) concerning the generation and subsequent use of records of patient care and professional activity. They are:

- Confidentiality
- Consent
- Liability

These three concepts underpin the need to record medical observations and patient care interventions and are discussed here from the perspective of EHRs.

Confidentiality

The privacy of patient identifiable data (personal information) is governed in England by common law, by the Human Rights Act 1998 and the Data Protection Act 1998, and in the US by Federal law. Requirements for confidentiality in the UK NHS are described in the NHS Confidentiality Code of Practice [3]. Confidentiality is one of the key professional requirements for pharmacists and pharmacy technicians, as with other healthcare professions, and the principle of confidentiality is included in the standards issued by the General Pharmaceutical Council [4] in Great Britain and by other professional regulators.

Patients reasonably expect information collected in confidence in the context of a medical consultation to be stored securely, and treated in a confidential manner (not disclosed in an unauthorised manner). Health professionals, including pharmacists, therefore are said to have a duty of confidentiality, and are required to ensure that the confidentiality of patient information is safeguarded.

Where there is a need to transfer patient information from one care provider to another, professionals should ensure that the transfer of information takes place as securely as possible, in accordance with current information governance and security requirements. When deciding whether or not to share patient information, the pharmacy professional's duty of confidence should be weighed against the need for the continuity of effective care, and the consequences to the patient if the information is not shared, so that a decision is made that is in the patient's best interest.

There are some clearly defined circumstances where a pharmacy professional is required to share a patient information with a third party without the patient's consent [4], for example to assist the police with a criminal investigation.

Consent

In the UK, the Data Protection Act 1998 requires healthcare professionals to obtain a patient's consent to store information about them to support services provided, stating the purpose for which the information is being collected. The principle of consent is established in the General Pharmaceutical Council Professional Standards [5], and in those set by other professional regulators. Pharmacists should therefore seek explicit, informed consent from a patient to store and process information to support any pharmacy services, in situations where there is no other overriding legal requirement to keep records. In the UK, when a medicine is dispensed, pharmacy professionals are contractually obliged to make a record of the supply, and presentation of a prescription by a patient constitutes implied consent to this process. However, for any pharmacy service other than the dispensing of medicines, which requires an activity record containing patient identifiable information, patient consent must be sought to record and store their personal information.

Liability

As well as ensuring quality and continuity of care, records of patient care and treatment have traditionally played a major part in providing evidence of appropriate patient care in situations when allegations of negligence are made. This has not been a major issue for pharmacists in the past, but as pharmacists take on new roles, and provide clinically-focused professional services, they will need to make appropriate documentation of patient care interventions in order to account for their professional decision making.

Some pharmacists may be reluctant to document professional activity in case it is challenged by a patient or relative at a later time. However, pharmacists should bear in mind that there is an equal liability associated with not comprehensively recording details of care provided, and should ensure that information is recorded that will defend their professional decision-making.

The other major liability issue is concerning the use of information from standard records. If the information is available in a standard record, such as a centralized care record like the English summary care record (SCR), then it might be argued that the record must be accessed *every time* that a professional decision needs to be made, in order for the health professional to avoid liability. This is a particular issue for pharmacists who are not working in clinic or office settings, and where records access is not easy, either for technical or feasibility reasons. For example, this issue has arisen in England with the proposed use of the NHS Summary Care Record by community pharmacists who would be working in busy dispensaries.

While specific services (for example, the English SCR) provide guidance for health professionals about liability associated with record use, the current consensus is that health professionals have a number of record sources available to them, and that they should use their professional judgment concerning the best record to access in each instance.

Information Governance and Data Sharing

In a healthcare environment where IT is increasingly used to produce a joined-up service across care settings, it is essential that community pharmacists, who may not be regarded as clinicians by the public, are seen to be handling patient information in a secure way when providing professional services.

This concern has been at the heart of the debate about community pharmacy access to the Summary Care Record, where some medical organisations and civil liberties campaigners have questioned the ability of pharmacists to handle sensitive patient information in what is seen as a “retail” environment. It is essential that community pharmacists fulfil their role as clinical professionals – but take on board the responsibilities that go with that role.

Information governance (IG) refers to the processes by which personal information is collected, managed, transmitted and used in a secure and confidential way in an organisation [6]. In the UK, the NHS Connecting for Health IG toolkit (www.igt.connectingforhealth.nhs.uk) for community pharmacy provides the pharmacy profession with guidance and a compliance framework to enable them to address these information management issues.

All patient information used by pharmacists, whether accessed from NHS services such as the Summary Care Record or stored in local or networked systems is subject to NHS information governance requirements in England. These requirements (currently 16 for community pharmacy in England) cover many aspects of good practice in information management and security and include, among others:

- Data transfer and sharing
- Risk assessment of data flows
- Staff Policies and Training
- Appointment of an IG lead
- Management of critical incidents
- Patient consent and awareness
- Use of mobile devices
- Physical security of hardware
- Use of mobile devices

Over the last few years, NHS Connecting for Health has rolled out IG requirements to various health professions in the UK – including GPs, pharmacists and dentists. Community pharmacies were required to undergo a baseline assessment by March 2010, and to have put into place a plan to achieve Level 2 IG toolkit compliance by March 2011.

Not only are the principles of IG essential for information security within individual organisations, they also have a key role in promoting intraoperability of systems, because it will assure the security of information transmitted between organisations in a standard format. It is clear from the UK government’s recent Information Revolution consultation that IG requirements will support some of the UK Government’s stated aims with healthcare IT, such as greater intraoperability and aggregation of outcomes data.

However, despite this clear requirement for IG compliance from an ethical and professional perspective, there are some pharmacists who regard IG requirements as another regulatory and bureaucratic burden that they have to work around. In the UK at present, the payor organisations, primary care trusts (PCTs), are responsible for implementing the IG agenda. Some PCTs have pushed for early pharmacy compliance with IG requirements – an approach that has not always been helpful. Some other PCTs have made little or no attempt to engage with the IG agenda, which has been equally unhelpful.

IG provides a useful framework of information security for the professional duty of confidentiality in the electronic information age, and should be taken seriously by the pharmacy profession, in order to assure public trust and be in a good position to develop patient-centred services in a consistent way across different localities.

UK Health Records Standards Initiatives

In the UK, there have been a number of initiatives that have shaped the medical records and information management agenda. The Shared Record Professional Guidance (SRPG) project was commissioned by NHS Connecting for Health in England, and led by the Royal College of General Practitioners [7]. The aim of the project was to develop guidelines on the issues surrounding the use and governance of shared electronic patient record systems in primary care, and a range of professional bodies and stakeholder groups were engaged with this project. The project published a report which described includes 16 principles for record sharing in primary care. These were:

1. The success of shared records programmes should be measured alongside the operational characteristics of these programmes allowing evaluation of such systems in a wider context.
2. Joint guidance on record sharing should be produced and maintained collaboratively by professional regulatory bodies and representative organisations to ensure a multiprofessional approach to record quality, consistency and clarity
3. A community using a shared record system should establish clear governance rules and processes that ensure the clear allocation of responsibility and define the rules and mechanisms for its transfer.
4. Shared record systems should be designed to support the governance principles outlined in Principle 3.
5. Health professionals should have a shared responsibility for maintaining and assuring data quality in a shared record system.
6. The education and training of health professionals should enable them to meet their legal, ethical and professional responsibilities for using and managing shared record systems. This should form part of their ongoing professional development.
7. Semantic issues should be considered in the design and implementation of shared record systems so that meaning is preserved and must be sensitive to issues of language, interpretation and context.

8. Governance arrangements should be in place to deal with errors and differences of opinion in shared record systems.
9. Organisations should have the facility to update/correct erroneous information added to their records from other sources, (with the original information retained in the audit trail).
10. The content and provenance data should identify unambiguously the originator or editor of each entry in the shared record system.
11. Shared record systems should be able to store and present information in styles that meet the particular user's needs.
12. Shared record systems should improve the quality and safety of care by facilitating communication and coordination between health professionals and informing best clinical practice.
13. Shared record systems should support structured communications between users.
14. Health organisations should be able to explain to patients who will have access to their shared record systems and must make information available to patients about such disclosures.
15. Health professionals should respect the wishes of those patients who object to particular information being shared with others providing care through a shared record system, except where disclosure is in the public interest or a legal requirement.
16. There should be an organisational guardian with clinical and information governance responsibilities for that organisation's shared record system in order to assure best practice is followed.

Another key issue with records standardization is that, in the past, records design has largely been the work of system suppliers, informatics specialists and some interested clinicians (largely doctors). However, for EHRs to be used universally in healthcare, there needs to be involvement of all healthcare professionals in record design, so that systems reflect the information needs and working processes of all healthcare professions.

In 2008, the UK NHS Connecting for Health (CfH) funded a project to broaden professional engagement in the development of clinical record standards, and to develop standards for the structure and content of health records. This project was led by the Royal College of Physicians (RCP), and engaged representatives from healthcare professional bodies, regulators, government agencies and other stakeholders. Following a national workshop and a consultation, the report "*Developing Standards for the Structure and Content of Health Records: Workshop Report*" was published in 2009 [8].

The report made the following recommendations:

- The rationale for professionally agreed record standards should be incorporated into pre- and post-registration educational curricula, and continuing professional development, as soon as possible.
- The standards agreed for the medical admission record, and handover and discharge communications, published by the RCP, should be disseminated widely and incorporated into the induction training of junior doctors as soon as possible.

- Healthcare professional bodies should work with stakeholders to take forward the development of standards for the structure and content of records appropriate to their own profession, specialty or discipline.
- This work should develop evidence and consensus based record standards for individual clinical specialties, care processes, and settings according to agreed priorities.

This initiative led not only to professional bodies taking steps towards formulating standards for record content which reflected their own disciplines, but also encouraged professional bodies to work together on record standards issues.

EHRs – Principles of Design and Use

What Is an EHR?

An electronic health record (EHR) may be defined as an information source in electronic form which contains identifiable information concerning a patient's medical care, and which is used to enable quality and continuity of care, and provide a record of care should subsequent queries arise.

The EHR may include, but is not restricted to:

- Diagnoses
- Medical History
- Allergies and ADRs
- Results of pathology and other tests
- Prescribing History

Systems Used for EPRs

A variety of electronic systems may be used to store EHRs. In pharmacy practice, these might include:

- Pharmacy systems or Patient Medication Record (PMR) systems for community pharmacy (see Chap. 6)
- GP systems and primary care medical record systems (see Chap. 5)
- National summary or emergency record services (e.g. the England Summary Care Record), which may be accessed via a pharmacy PMR system or by some other application.
- Other systems used by specific healthcare providers.

While this chapter will discuss the patient information within the systems, the detailed operation and workflow of pharmacy systems and GP systems will be considered in subsequent chapters. One or more of these systems may be available within a pharmacy or dispensary, depending on the type and affiliation of pharmacy (independent or multiple, separate organization or part of a medical practice).

Pharmacy professionals should exercise professional judgment concerning what information might be available from different systems, and should seek to make professional decisions with as much relevant information as is possible.

In multidisciplinary environments, the influence of pharmacy staff on the implementation and configuration of EHR systems may be limited. However, where possible, pharmacists should ensure that systems that they use comply with the principles of the UK NHS Care Record Guarantee [9] and other relevant information governance requirements, and industry standards. Pharmacy professionals also have a professional duty to ensure that EHR information is safeguarded from actions of non-pharmacist employers, which might compromise the integrity and confidentiality of the information.

EHR systems should provide appropriate access security, and should contain a comprehensive metadata set, including time and date stamps for each entry and an audit log of users making changes to records. The data fields on the EHR system should be adequate to provide the level of pharmaceutical care provided by the pharmacy.

Creation of EPRs

An EHR may be made available to pharmacists through a shared system such as a GP system, institutional medical record system or a national care record service, such as the English SCR. In this case, pharmacy professionals are not responsible for the creation of the record, although they are responsible for the safe access and appropriate use of the information in their sphere of practice.

However, pharmacy staff create a patient record *de novo* when patients seek a pharmacy service, and the pharmacy does not have access to a shared record.

When a patient brings a prescription or medicine order into a pharmacy to be dispensed, consent to the process of supply is implied and pharmacy contractual arrangements generally stipulate that a record of the supply must be kept on the PMR. Consent for the creation of a record relating to the supply of a medicine is therefore implied.

However, where a service is provided by the pharmacy which may or may not involve the supply of a medicine, then the patient must give informed consent to use of the service, which includes recording of patient information relating to the service on the EPR system. Therefore, if the patient presents for, or is recruited to, a pharmacy service in the community such as medicines review, management of long term conditions or smoking cessation, explicit consent must be given by the patient for their information to be recorded on the EPR system.

However, it is debatable how explicit, informed consent should be given to enable creation of an EHR. Health services, such as the UK NHS, have a legal duty to maintain adequate patient records, and patient records are routinely created by hospital staff according to the IG framework for the hospital or health trust, without the consent of the patient. Conversely, however, the provision of any pharmacy service in the community by a contractor body would require consent from the patient for creation of the record at the point where the service is provided.

In line with the Data Protection principles, pharmacy staff must ensure that patient information is relevant but not excessive. Where possible, to ensure completeness of the medication record, pharmacy staff should ensure that details of all medicines, including OTC and herbal medicines, are included in the EPR medication history.

Access to EHR Systems by Pharmacy Professionals

Pharmacy staff may access EHR systems for patient information in order to discharge their professional duties, in a way that is appropriate to their role and remit within the organisation.

There will be times when other pharmacy staff other than registered professionals will need to access the EHR system (for example technicians, assistants or counter staff), but they should do so under the supervision of a registered pharmacy professional.

Pharmacy staff must not access a patient record for any reason other than to enable provision of a pharmacy service. Use of the EHR for personal reasons would be unethical.

Where the EHR needs to be accessed for any other reason than the supply of a medicine – for example, to answer a patient query, or for an initial or follow up appointment for a pharmacy service – the patient's explicit consent must be obtained. This should be stated in any standard operating procedures (SOPs) for pharmacy services.

Consent for the use of the service and EHR should be sought in accordance with the appropriate legal requirements and professional standards for patient consent [5]. In England, an adult with the capacity to give consent or a child who understands the nature of the service (so-called Gillick competence) must give consent for use of the EHR. Consent for a young child should be given by a parent or guardian, and consent for an adult without capacity to give consent should be given by an appropriate person according to the Mental Capacity Act 2005.

Often, access to the record is requested by the representative of the patient, rather than the patient themselves. Pharmacy professionals should bear in mind that no-one can give consent on behalf of a competent adult and, depending on the circumstances, pharmacy professionals should consider whether it is necessary to speak to the patient directly. However, the pharmacy professional should act in the best interests of the patient in this situation, if it is not possible to speak to the patient directly.

Access to the patient's EHR by a health professional should be based on the professional's role, and whether they have a relationship with care with the patient. Thus, for a pharmacist to be able to access a patient's record, not only should the pharmacist be a registered pharmacist with an appropriate license to practice, they should also be the pharmacist who has been chosen or assigned to provide care to the patient concerned. These principles of role based access (RBAC) and legitimate relationship (LR) have been specifically developed in the English NHS care records service, and will be discussed in more detail later in this chapter.

There may be various access controls to systems holding EHRs within organisations. This may be a username and password system in many organizations, and these require a robust policy of routine password changes and timed log-outs to ensure that information is not viewed with someone else's log on ID. Biometric access (i.e. finger print or retinal scanning) is becoming more commonly used in many systems but is still too expensive to be scaleable in larger healthcare organizations. The UK national healthcare IT initiatives have a Smartcard and PIN system for gaining access to records services. The Smartcard and PIN, allows them access only to appropriate records, and to perform appropriate tasks in relation to those records. The process for obtaining a Smartcard involves the healthcare professional proving identity beyond reasonable doubt, and then they are given appropriate access privileges based on their NHS role. The NHS has had to ensure that there are appropriate procedures for Smartcard issue and maintenance, both for healthcare practitioners and students/trainees. This must be based on verification of identity, just as for other NHS staff and contractors.

The issue and maintenance of Smartcards for healthcare professionals is controlled by a Registration Authority (RA) in each area. The RA is an NHS body, usually the PCT (payor) organization. At present only NHS organisations can set up a Registration Authority and this has two implications:

- RAs need to work jointly with educational establishments to manage the process of identity checking and issuing of Smartcards to students and placement trainees.
- Non-NHS bodies may not act as a RA, even if they have the resources and the governance framework to do so. This is of particular importance to pharmacy; for some time, large pharmacy multiples have wanted to set themselves up as RAs, in order to better manage the issuing and use of Smartcards held by employee pharmacists, wherever they are based. There is a sound operational argument for pharmacy multiples to be designated RAs.

Liability for Record Use

Pharmacy professionals are responsible for the completeness, accuracy and timeliness of information on EHR systems used in the pharmacy setting, if they are able to make entries to the record.

If a pharmacy professional makes a professional decision in good faith based on information in the EPR that is subsequently found to be inaccurate, they should not

be liable for any unintended clinical consequence. However, pharmacy professionals would be expected to be alert to any obvious errors or discrepancies in the record, according to their qualifications and experience.

If a pharmacy professional identifies an error in an existing EHR, and they have write access to the record, they should correct the error and amend the record appropriately, if they have the correct information to do so. If the pharmacy professional does not have write access to the record, they should inform the record's originator.

As mentioned, a pharmacy may have one or more EHR systems available. Pharmacy professionals should use the most appropriate information sources to support their professional decision making. Pharmacy staff should review any information that may be feasibly accessed in order to reach a professional decision, according to their professional judgment.

However, pharmacists should bear in mind that if they chose not to view a patient's records stored on the PMR or not to contact a doctor to ask for the medical records to be checked then, were the patient then to come to harm or subsequently complain because of an issue that arose as a result, it might be difficult to defend the case.

Subject Access to EHRs

Under the UK Data Protection legislation, the subject of any personal information has a right of access to that information. In the UK, the patient's right of access to their medical records is established in the NHS Constitution [10] and the Information Commissioner's Office provides guidance about subject access to patient records [11]. In addition, the Royal College of General Practitioners has issued guidance on providing patients with access to their medical records, which covers legal and ethical background; security, registration and authentication; guidance for health professionals writing records that can be shared with the patient; self management and shared decision making; test results; the patient sharing the record with someone else; third party data; psychiatric and mental health data; children; and responding to issues of accuracy and interpretation identified by the patient.

Evidence from the medical profession suggests that access to EHRs by patients has benefits in patient care, and does not lead to increased litigation [12]. So-called triadic consulting where both the clinician and the patient view the EHR on the computer screen during the course of the consultation is common in many areas of medicine [13].

The presence of a consulting room/area in pharmacies for the conduct of medicine reviews (medicines use reviews (MURs)) and other pharmacy services, with a workstation in the consulting room enables pharmacists to discuss medicines with a patient, with the EHR available to view for both parties. However, it should be remembered that there may be occasions where the pharmacist will need to view the patient's record prior to a consultation, without the patient being present.

If the patient identifies an error in their record when viewing the EHR, then the pharmacy professional should use their professional judgment to take appropriate steps to correct the record, validating any new information from the patient, and liaising with the patient's GP as necessary.

Viewing the EHR

The availability of the EHR on a workstation in the consulting room has made it easy for the health professional and the patient to view a patient's record during the course of the consultation, although healthcare professionals may need to develop consultations skills that enable them to use an EHR as part of the consultation in an appropriate way.

Pharmacists are increasingly providing a wider range of healthcare services to patients, and many community pharmacies have consultation areas on their premises. However, while some of these consulting areas may be specific, separate rooms for the purposes of patient consultation, others may be no more than booths or kiosks offering little privacy away from the dispensary or retail space.

While it is to be hoped that all community pharmacies invest in adequate consultation rooms, there may be circumstances where space and resources limit the facilities that can be made available. Nevertheless, pharmacists will need to consider how an EHR workstation may be appropriately used in the consulting room, and how the security of the information available on the workstation can be maintained.

Pharmacy managers should take steps to ensure that a patient's record is only on screen for the duration of the consultation and that systems are in place to ensure that the workstation cannot be accessed in an unauthorised manner when the consultation room is not in use.

Sharing of Data

There may be occasions when data on a patient from an EHR system used by pharmacists may need to be shared with another healthcare professional or provider to provide the most appropriate care for the patients. Where a shared record system is established, and the other healthcare professional is a system user, this issue presents no specific difficulties. However, if the patient's information is to be shared with healthcare professionals and providers from external organizations, pharmacists would need to consider how patients are advised of the need to share data with third parties.

When sharing patient data with other health professionals, pharmacy professionals should ensure that appropriate confidentiality and data security measures are in place, in accordance with information governance requirements (for example when sending faxes). While pharmacists have a duty of confidentiality, the need for absolute patient

confidentiality should be balanced with the need for the continuity of effective care, and the consequences to the patient if the information is not shared because the patient's consent could not be obtained.

Under the UK NHS CfH Information Governance requirements for pharmacy, pharmacy organisations should make patients aware of what data are collected and stored about them at the pharmacy (or available to the pharmacy), and with whom this data might be shared. This process would be via an information sheet that is available at the pharmacy, and given to new patients coming to the pharmacy.

If a patient's information needs to be shared with a health professional or provider not mentioned in the patient awareness leaflet, the patient's explicit consent should be sought to share the data.

Pharmacy staff should be aware that there are some statutory situations where a patient's data may be disclosed to a third party without the patient's consent, for example, cooperation with the police in a criminal investigation.

Use of Data for Purposes Other Than That for Which It Was Collected

Patient data on EHR systems should be used only for the provision of pharmacy services and for identification of individuals eligible for pharmacy services under the supervision of a pharmacist. Patient data on EHR systems must not be used inappropriately or in an unprofessional manner.

The use of EHRs in the pharmacy must be in line with appropriate legal requirements, information governance arrangements and professional standards. Data from EHRs must not be used for commercial purposes, other than the provision of pharmacy services. Furthermore, EHR data should not be used for research purposes without the appropriate patient consent and ethics approvals being secured from the appropriate authority.

Business Continuity

Pharmacy organisations using EHRs routinely for patient care should satisfy themselves that system suppliers and other IT support services have appropriate business continuity arrangements in place to ensure that, if systems fail, there is an appropriate level of EPR access to ensure the safety and quality of patient care.

There is a requirement for business continuity in the England Information Governance requirements for pharmacy, for which more detailed guidance is currently being prepared.

Archiving and Destruction of Records

EPRs must be retained by organisations in accordance with legal requirements for records retention, and local records management policies. The usual UK legal requirement is that personal health records should be retained for 8 years after the date of last treatment/record access.

Electronic Health Record Initiatives

Large, integrated health record systems have been installed by healthcare maintenance organisations (HMOs) in the United States, such as the Veterans' Administration (VA) and Kaiser Permanente (KP). These systems provide a medical record, with supporting functions, to support medical centres across large regions. These systems will store patient data and also support medication records, clinical decision support, test results and electronic billing and claims. With a common technical infrastructure and within a single HMO, the use of these systems may be critical for ensuring the quality of care and appropriate resource management in patients with long term conditions [14]. However, to date, there has been little research to quantify the benefits of EHRs to support integrated healthcare delivery by US HMOs.

Graez et al. [15] studied the effect of EHRs on the coordination of healthcare in the KP north California scheme, and found that clinicians with 6 months or more experience of using EHRs were more likely to report timely access to complete medical information, and a broader consensus on treatment goals among clinicians involved in a patient's case. These findings are likely to lead to a reduction in the number of medication related errors in this environment.

In a study of the KP Ohio scheme, Khoury [16] indicated that the system improved compliance with clinical guidelines, improved classification of asthma patients, provided streamlined electronic billing and reduced operating costs for the organisation.

A study of clinician attitudes to the North-western KP programme, based at Portland, Oregon (Marshall and Chin [17]) showed that clinicians perceived an improvement in the quality of patient care with the use of the EHR with increased ability to coordinate care with different departments and to detect medication errors, and improved timeliness of referrals and test results reporting.

Nevertheless, not all experiences of EHRs for integrated care in HMOs have been positive. In a study of the KP Hawaii scheme, Scott et al. [18] found that the process of EHR implementation was not straightforward. They found that:

- There were software design issues that increased resistance to the adoption of the system.
- The system reduced clinicians' productivity, especially in the early stages of system implementation, an observation that has been made with some electronic prescribing systems.

- The system required clarification of clinical roles and responsibilities, which caused some concerns for clinicians and other staff.

It is possible that some of these implementation issues could be surmounted with an appropriate change management process.

Also in the US, systems have been developed which provide a centralised, aggregated record of medicines information relating to both prescribing and pharmacy activity. The Regenstrief medication hub [19] has been developed in the US to combine patient prescribing records with pharmacy claims data, to produce a complete and integrated medication record, which can then be used to support electronic prescribing. This system also provides benefit eligibility data on treatments and can therefore be used to provide formulary control. The need for an integrated medicines record is discussed in greater depth in Chap. 6.

The English Summary Care Record (SCR) has been developed for use in unscheduled care settings (for example, A&E or out of hours medical care) when the detailed electronic care record is unavailable. The SCR content has been uploaded from GP summary information. The SCR provides four key elements of information – diagnosis, current medications, allergies, and adverse reactions and, in some areas, other aspects of the GP record. The Summary Care Record has been piloted extensively in order to test both the clinical utility of the information displayed and also the procedure for discussing and recording the patient's permission to view SCR data.

The Summary Care Record contains the following information:

1. Allergies.
2. Adverse reactions.
3. Acute prescriptions in last 6 months.
4. Current repeat prescriptions.
5. Discontinued repeat prescriptions in last 6 months.
6. *May* also contain additional information such as diagnoses or patient preferences.

The SCR may also contain additional information such as significant medical history. The SCR offers particular benefits for unscheduled care – for example A&E departments will be able to view a patient's record to assist with the emergency treatment of that patient, for whom they may have no information. The SCR has been shown to be of considerable value for medicines reconciliation by pharmacy staff when patients are admitted to hospital, and has been used for this at the Bolton Hospitals [20]. It is now being piloted to assess its benefits in community pharmacy.

The SCR is a form of EHR and the general principles described above apply to its use in a pharmacy setting. However, the SCR has specific rules and concepts, which will be briefly discussed here. The use of the SCR in pharmacy settings is in its infancy in England and, while a number of localities have used the SCR, official pilot studies will be required to fully understand the practical use of the SCR and any procedural issues associated with it in a pharmacy context. The SCR is one of several possible sources of medicines information available to the pharmacist, and

its use should be considered in the context of the other sources of information available to a patient.

For further information please see:

<http://www.connectingforhealth.nhs.uk/systemsandservices/scr>

Access to a patient's Summary Care Record is governed by the permission to view model developed by NHS Connecting for Health. The patient's permission must be sought to view that patient's Summary Care Record and this process is based on six principles:

1. The explanation to a patient, as part of seeking permission to view, should be simple, straightforward, honest and appropriately communicated.
2. A patient's permission should be sought by the care setting wishing to view their Summary Care Record.
3. Care settings should be explicit about the scope of permission being sought i.e. who is being given permission, for how long and in what context.
4. The scope of permission obtained must be recorded.
5. Before setting the "not to be asked in future" consent status for a patient, the user must be sure of the patient's wishes in terms of scope of this permission.
6. Permission to view does not apply where the patient is unable to give permission to view, and the clinician acts in the patient's best interests.

Pharmacists must therefore seek permission to view from the patient for each episode of care for they wish to access the patient's SCR. However, there are a number of issues that affect pharmacies concerning permission to view. An "episode of care" may be activity-based, for example, the dispensing of one prescription or the installments of a repeat prescription. Alternatively, the episode of care may be time-based – for example, permission to view for all pharmacy activities for that patient in a 6 month period. The activity-based approach is problematic as pharmacy staff would need to ask patients repeatedly for permission to view for different activities taking place concurrently, and would be required to not use information that they already knew from the SCR for a second activity, if that permission were not given.

A time-based approach to episodes of care is therefore more practical, although pharmacists would need to identify suitable means for recording permission and put in place a system to allow for updating of permission to view when the period ends, if a designated time period is agreed.

The other issue for pharmacies is how permission to view would work if a patient received services from a pharmacy multiple, and could present at two or more of its local branches. Permission may apply to more than one branch, but the pharmacist requesting the permission to view would need to explicitly request this, and the patient would need to fully understand the scope of the permission to view that they have granted.

As already mentioned, a clinician needs to have a legitimate relationship with a patient in order to view a patient's clinical information. That is to say that only healthcare staff actually involved in the patient's care can view their clinical information.

The SCR conventions define several types of LR, but only two LR types are relevant to the use of the SCR in community pharmacy. They are:

- Patient Self Referral LR – created when a patient presents themselves for treatment to an individual or a workgroup (a team, or set of teams, that work together to provide a service to patients) and which has role separation and lasts for 26 weeks. Role separation means that one person sets up the LR and another accesses the clinical information e.g. call handler and clinician or pharmacy worker and pharmacist.
- Clinician Self Claimed LR – created for a single user accessing the SCR without a workgroup or role separation and therefore without validation from a second party, which lasts 5 days.

A concern that many English pharmacists have is how the information provided on the SCR relates to that which they will have available on their pharmacy system. Pharmacists will be confident with the patient medication record information on the pharmacy system/PMR, but there will be times when the use of a national service such as the SCR will supplement the local information available on the pharmacy system. For example, using the SCR may help to resolve a discrepancy between the pharmacy system and the prescription, or between the pharmacy system and the patient's recollection.

Pharmacists have also raised the issue of transfer of information from the SCR into local IT systems. Transfer of information into local systems by cutting and pasting may be beneficial to patients. However, if information from the SCR is placed into a local system, there is no mechanism to ensure that the information is updated. Furthermore, the owners of the local system are then required to maintain the security of their local system in a manner comparable to the national system.

In Wales, the Individual Health Record will be created from the GP summary, and is available to doctors and nurses routinely in out of hours services, and is being used by pharmacists at the Medical Admissions Unit at the Royal Gwent Hospital.

The Individual Health Record contains the following details:

- Name, address and contact details
- Details of current GP practice
- Record of current and recent medication
- Medical problems from GP consultations
- Recorded allergies
- Results of any recent tests – for example, blood tests and x-rays

Only the last 2 years of medication history and 1 year of test results will be shown.

As with the English Summary Care Record, patients need to give consent to allow a health professional to access their record, and there is an opt-out system for patients who do not want to have an Individual Health Record.

The Scotland Emergency Care Summary (ECS) contains the following information:

- Name
- Date of Birth
- CHI Number (NHS Scotland identifier)
- GP Surgery details
- Allergies and ADRs
- Prescribing History

The ECS is viewable by doctors and nurses at out of hours centres, A&E departments and also by NHS 24 staff. Pharmacists have been able to gain access to ECS information through patient contact with NHS 24. In the near future, the ECS will be tested for medicines reconciliation by hospital pharmacists.

The ECS is extracted from the GP record and, as with other national health records in Great Britain, patient consent is required every time the record is accessed. Patients may opt out of the scheme by contacting their GP surgery.

Benefits of EHRs

EHRs provide a number of benefits (benefits of EHRs) to healthcare professionals in their professional practice and in delivery of healthcare services. These include:

- Enabling record security – depending on the design of the system, EHRs are likely to be more secure than paper records.
- Structured content of the record – the record may be structured in such a way as to support each professional activity in the healthcare workflow. Thus, in a GP system, the record content can be displayed in a structured screen to aid the GP consultation process.
- Provision of decision support tools – the availability of the patient record in an electronic format means that electronic decision support tools can be made available in an interruptive or non-interruptive manner at the point where information is entered onto the record.
- Patient record information is legible and may be used to support other IT applications.
- Improved access to patient information for healthcare professionals authorized to view a patient record.

Because of these features, EHRs have the potential to reduce adverse drug events and improve patient outcomes by their effects on the quality of care. However, the results of studies on the clinical benefits of EHRs are mixed. In a transfer of care study, Boockvar et al. [21] concluded that there was no difference between patients with an EHR and non-EHR patients, in terms of the number of medication-related discrepancies in the records, and that specialist tools would be required as part of the record system to facilitate medicines review. Indeed, Hurdle et al. [22] noted

how a large number of adverse events relating to medication remained undetected within a Veterans' Administration (VA) EHR system in the US, despite a prospective chart review study. In any case, even if decision support tools within an EHR are effective, there may not be an obvious link between appropriate decision support alerts and positive patient outcomes. This was observed by Smith et al. [23], in a study on the Kaiser Permanente, North-Western system, where alerts were found to reduce the prescribing of potentially contraindicated agents (e.g. tricyclic antidepressants) in the elderly, but the effect of the alerts on patient outcomes and morbidity was not clear. In a US study, Orrico [24] noted discrepancies between the EHR system record and actual medicine use. It was common for medicines to be recorded on the EHR, but no longer taken by the patient. They indicated that medicine stop/review dates would be helpful to prevent this situation, and that a system of medicines reconciliation and review would be beneficial.

However, the use of structured data within an EHR system has the potential to identify cohorts of patients systematically where intervention may have positive health benefits. In a study looking at the identification of adverse events relating to amlodipine in UK general practice, Mohamed et al. [25] concluded that primary care prescribing databases could easily be used to identify ADRs by looking at cohorts of patients where a medicine has been discontinued. In a data study of 61,251 patients in two US outpatient settings, Buck et al. [26] demonstrated that EHRs could be used to identify potentially inappropriate medication (PIM); they found that female sex, polypharmacy (≥ 6 medicines) and multiple clinic visits were key determinants in identifying patients with PIM. While these factors themselves are well recognised in the literature as pointers to poor prescribing, the EHR system automates the search process by which patients can be identified. The use of EHRs for screening patients for medication related problems was also demonstrated by Roten et al. [27] in a Swiss clinical pharmacy study with 501 patients. They found that the EHR efficiently identified drug related problems in 64.7 % of the 501 patients.

In an Australian study, Berbatis and Sunderland [28] looked at the impact of linked EHRs for the prevention of diversion of pseudoephedrine for abuse purposes. They found that the use of EHRs to monitor supplies of drugs from a number of sources was an effective way of dealing with the pseudoephedrine problem and could be used for other drugs of abuse too.

Frenzel [29] has further conjectured that EHRs could be structured with disease management in mind, and could be used to teach pharmacy students disease management activities, and help them to develop patient care skills.

A benefit of a patient's EHR being available in a controlled electronic format is the potential for direct patient access to the record via a web portal. In the UK and other countries, more patients want to be able to view their medical records and the UK Royal College of General Practitioners has produced guidance to help doctors deal with patient requests for access [12]. However, there is little documented experience of remote patient access to EHRs to date. In a telephone survey of citizens of seven European countries, Santana et al. [30] found that the use of the internet for communications between patients and healthcare professionals was still rare. A Swedish study of a web portal to make medication record information available

to patients [31] found that users of the service appreciated having their medication information available to them on the web, and the authors recognized that there was a need to make more patients aware of the service. However, there may be social and cultural factors affecting the uptake of online access to medical records. Roblin et al. [32] compared use of the KP Georgia scheme personal health record (web access to health records) in white and African Americans, and found that fewer African Americans than white Americans used the internet access scheme, and that differences in education, income and internet access did not account for this difference.

A Nuffield expert report on EHR use [33] indicated that EHRs had the potential to be transformative technology, which could provide end-to-end healthcare and change ways of working. However, the importance of EHRs was about providing clinical benefits, not just managing patient information. The authors highlighted that, while institutional systems in the US, such as VA and KP had the potential to deliver clinical and organisational benefits, there was a lack of evidence on the economic benefits of these systems. The potential benefits of EHR systems for the management of long term conditions are well recognized by governments and policy-makers. Barrett and Jennings [34] reported that the goal of the Canadian Health Infoway programme was to ensure that 50 % of Canadians had a electronic health record by 2010, including a prescribing history, allergy alerts and drug interactions, but this has not been fully achieved. Likewise, the purpose of the meaningful use initiative in the United States was to encourage more widespread use of EHRs by HMOs and providers, to harness patient safety and quality of care benefits. However, a study by Linder et al. [35], looking at the prescribing of antibiotics in response to a EHR respiratory infection dashboard, indicated that the meaningful use initiative in itself was not sufficient to improve care quality, and that improvements in clinical practice were required.

A 2009 report on the impact of EHRs [36] looked at a number of European systems and concluded that, with EHRs, the socioeconomic gain usually outweighed the costs eventually, but that the benefits realization phase was often quite long, in the order of 4–11 years following system implementation.

Clinical Pathways and Content

As well as explicit workflow decision support tools, EHR systems may be used to provide electronic care pathways, where the user is directed along a particular care pathway for a patient, based on the workflow of the system. The NHS in England has been developing care pathways since the 1990s, but progress with the development of electronic care pathways has been slow. A good approach would be the prioritization of electronic care pathways for those areas where there is a substantial national consensus on paper-based care pathways, e.g. stroke, diabetes and falls. A useful UK initiative is the Map of Medicine, which provides evidence-based treatment pathways for a range of disease areas [37].

Related to the development of electronic care pathways is the development of electronic templates for clinical assessment tools for use by healthcare professionals in provider organisations. The templates will enable staff to directly record assessment data into the patient's EHR. Once recorded electronically, the assessment data can be used by all healthcare staff involved in that service user's direct care, and for secondary purposes, e.g. clinical research, audit, performance management and commissioning. In the UK, these tools have been developed by various healthcare professions, most notably occupational therapists, but the use of these in pharmacy practice is still in its infancy because pharmacists have traditionally not conducted their consultations in an office environment with a workstation at the point of consultation.

While various software tools have been developed to support pharmacist consultations (within and beyond pharmacy management systems) for new pharmacy services, it is to be hoped that there would be more standardization of clinical assessment tools and content to support pharmacist activity in future. This may involve the adoption of clinical content or workflows developed in a multidisciplinary way, but there will be a need to develop material specifically to support pharmacist working processes.

The following elements are needed to develop authoritative and useful clinical content:

- An appropriate sponsor, e.g. healthcare professional body
- Widespread use and best practice recommendation for a specific assessment purpose
- No copyright or licensing issue for use in relevant health provider organizations.

Once clinical content has been developed and endorsed by professional bodies, it can then be adopted by suppliers of EHR and other systems.

Optimisation of EHRs for Pharmaceutical Care

Hospital pharmacists in the UK have undertaken some important pioneering work in creating pharmaceutical care record templates and recording systems to support their field of practice [38, 39]. However, while a number of centres around the UK have developed record templates, this work has not been undertaken consistently around the country and a national standard for pharmaceutical care has long been sought by clinical pharmacists.

The development of a pharmaceutical care record standard has the potential to provide the following benefits:

- Providing an agreed standard for format and content of pharmaceutical care records, which is patient-centred and therefore independent of care setting and area of pharmacy practice. This may be used as a foundation for the development of innovative services.

- Promoting a unified approach to pharmaceutical care and intervention recording across the pharmacy profession, and therefore improve communications across the profession.
- Provision of a standard to support professional teaching and development.
- Increasing awareness outside the profession of the contribution that pharmacists make to patient care.
- Improving communications between pharmacists, other healthcare professionals and patients.
- Providing a standard for future development of IT systems in medicines management.
- Providing a foundation against which key outcome measures may be determined.

However, the development and adoption of an agreed standard for data content and format in recording pharmaceutical care and pharmacy interventions highlights a number of important issues that would need to be acknowledged or addressed in the development of any record standard.

Firstly, any standard produced for pharmaceutical care would need to support aspects of care of particular importance to pharmacy (e.g. formulation types, compliance and use of compliance aids), but would need to be consistent with the work of other healthcare professions in this field. In the UK, the most prominent standard for record keeping on medicines is Royal College of Physicians medical records standards for admission and discharge.

Secondly, a standard for record keeping will highlight pharmacy practice more which could then be open to scrutiny. While a culture of record keeping and recording details of care provided has been in place in the medical profession for many years, this is a new concept for many pharmacists. A standard care record for pharmacy practice may therefore be perceived as a threat by some pharmacists, and they may need training in note-taking and maintaining records of interventions. Work in other professions has shown that failure to make records can be detrimental to patient care and professional accountability.

Thirdly, some pharmacists have been routinely maintaining records of interventions made and care provided in their specialist areas of practice for some years now. The adoption of a standard pharmaceutical care record will need to take into account and affirm the good work that these pharmacists are already doing.

Applications of EHRs for Pharmacists

EHRs of different forms may have a number of applications for pharmacists in their professional practice. These include:

- When dispensing prescriptions to check for interactions, contraindications and allergy status. It is recognised that PMR systems already provide functions to check allergy status and interactions.

- Supporting self care and promoting healthy lifestyles – knowing what (other) medication a patient is taking.
- For conducting medicines reviews.
- For conducting medicines reconciliation at the point of hospital admission.
- During a medicines use review (MUR) to verify and compare medications currently being prescribed for the patient and their allergy status.
- When supplying over the counter (OTC) medication from the pharmacy.
- When dispensing private prescriptions.
- When dispensing an emergency supply (at the request of the patient) to allow the pharmacy professional to verify the name, form, strength and dose of medication previously had by the patient.
- When recording details of interventions made by the pharmacist concerning a prescription or over the counter medicine sale. The Royal Pharmaceutical Society of Great Britain has previously issued guidance on the recording of interventions [40] giving advice on when to record interventions, where to record interventions and how long to retain intervention records for. However, while the guidance gives outline advice on what information to record, this is not covered in detail.

The Content of a Pharmaceutical Care Record

The best approach to developing the requirements for a standard EHR designed for use for a particular healthcare professional practice is to consider the scenarios that the healthcare professional faces in their professional practice. This will enable the development of a use case for each scenario, and for the specific information requirements around the scenario or activity to be understood. These scenarios should describe the care activities for the patient – so, from a pharmacy perspective, the process planning to design the EHR should be focussed on the care of the patient, rather than the supply of the product.

This would mean that:

- An outline as to the type of processes and formatting required could be identified.
- The required data items would be clearly identifiable from the scenarios described.
- The correct set of patient information would follow the patient from one care setting or scenario to another.

Each pharmacy practice scenario described should be analysed by asking the questions:

- Who?
- Where?
- When?
- What?

This approach would ensure that the pharmaceutical care processes are fully understood. Subsequent implementation of a well-designed pharmaceutical care record would ensure that the pharmacy team providing care is able to identify and meet the pharmaceutical needs of a patient and take responsibility for delivering the appropriate care.

A pharmaceutical care record should take into account the interdisciplinary care of the patient. The pharmacist may therefore also want to know and record:

- What other HCP are involved in their care (are any professionals not involved who should be?)
- Recommendations made by other healthcare team members
- Referrals made to other healthcare team members arising from disease monitoring
- Any professional concerns that have been recorded – whether they have been followed up or alerted to other professionals (e.g. social care)?

The boundaries between healthcare and social care may not be clearly delineated within a healthcare economy, and professional bodies and policy makers may need to make scope decisions concerning the adoption and use of record systems.

Appendix B gives a suggested domain map for a standard pharmaceutical care record. A pharmaceutical care record would therefore need to have the following basic elements:

1. Patient Demographics – sufficient to identify the correct patient beyond reasonable doubt.
2. Patient Details – age, weight
3. GP Details
4. Social Information
5. Previous Medical History
6. ADRs/Allergies
7. Current/Recent Medication
8. Tests & Investigations
9. Pharmacist Recommendation – medicine and counselling
10. Referral Information
11. Recent referrals, new referral

A key assumption of the process is that all information recorded is date, time and user stamped, in order that an audit trail of care could be established.

Pharmaceutical care records should support the following situations.

Medicines Reviews

Pharmaceutical care records should support the process of medicine review in an iterative manner. There are two distinct types of review scenario:

- (a) Medicines Use Review (MUR) (primary care based review and probably a subset of a clinical review) (a specific remunerated service in the English pharmacy content)
- (b) Clinical review (broader more in-depth review).

MURs can happen without an appointment, and therefore can be opportunistic. An MUR can be conducted in response to an intervention, or to determine if a full clinical review is warranted. With an MUR, information on medication use is obtained from the patient, to initiate a two way dialogue concerning concordance, to determine the patient's views and beliefs about their medicines. MURs are practically and socially based. Patients need to consent for an MUR to be conducted and communication to GPs or onwards as necessary. For medicines reviews, a pharmaceutical care record should be able to record reason for the review, consent to the review, comments concerning specific medicines, and provide decision support for specific medicines.

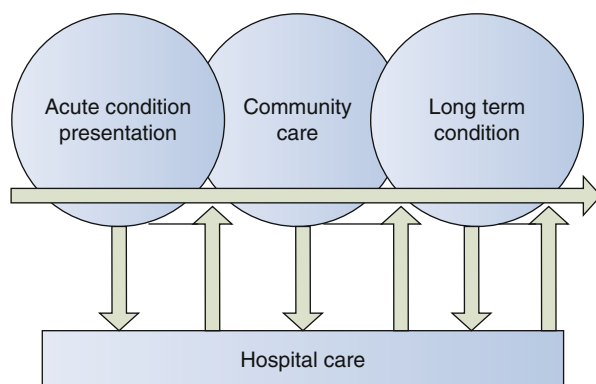
Medicines Reconciliation

The process of medicines reconciliation is where a pharmacist or pharmacy technician reviews a patient's medication when the patient is admitted to hospital or other healthcare institution, by taking a full medication history from the patient. The medication history taken from the patient is then compared with the actual medicines brought in by the patient, and available medication records, in order to ascertain exactly what medicines a patient has been prescribed and what medicines they are actually taking. The availability of a centralised medication record from the patient's usual physician is an important part of establishing an exact medical history and therefore ensuring that (a) important medicines that the patient has been taking are not inadvertently omitted, or (b) that the patient does not suffer adverse effects from being given a medicine in hospital that was prescribed but was not actually taken prior to admission. Consequently, centralised systems such as HMO systems in the US and summary records such as the SCR, ECS and IHR in the UK have an important role to play to enable medicines reconciliation in hospitals. Smith [20] has reported the use of the SCR for medicines reconciliation at Bolton Hospital, UK. The use of the SCR for medicines reconciliation provided the following benefits:

- The system provided an accurate source of up to date information.
- The system was accessible outside the opening hours of doctor's surgeries/offices, and meant that doctors did not have to spend time responding to routine medication enquiries.
- There was an improvement in patient safety and quality of care.
- The system provided an auditable record of access to patient data.

Similar benefits have been reported by users of the Scottish ECS and the Welsh IHR. In addition, specialist software has been developed to enable local medicines

Fig. 2.1 Care process for treatment of long-term conditions



reconciliation. Schnipper et al. [41] conducted a quantitative study on an electronic medicines reconciliation system, and found that its use led to a small decrease in medicines discrepancies, from 1.44 per patient, to 1.05 per patient.

Shared Care

This encompasses medicines that are managed jointly between different elements of the NHS. It thus covers medicines that are wholly secondary care managed as well as those that are managed jointly, and may also include community-based services (e.g. family planning etc). These are medicines for which an incorrect assumption that the hospital is managing the monitoring, prescribing etc is made when this may or may not be the case.

The pharmaceutical care record requirements for this situation should therefore facilitate the sharing of information about care in another setting (formal and informal), and identify specific responsibilities for care, as well as manage the transfer of care process.

Care across interfaces can cover the following clinical situations – chemotherapy, epoetin, renal dialysis, anti TNF agents, pharmacist clinics, ‘red’ drugs – hospital only, pumps, implants, specialist imports, CIVAS items and various others.

Long Term Condition Management

The pharmaceutical care record should facilitate exchange of information and continuity of care between acute treatment settings and chronic care of long term conditions. It should be able to provide support to the pharmacist who takes on responsibility for monitoring and support of, and supplementary prescribing for, patients with long-term conditions in the community. Figure 2.1 summarises the possible relationship between acute condition, community care and long term condition management in primary care. Pharmaceutical care records should be designed with this or a similar process in mind.

Homecare Supply

Clinical homecare is where a patient is prescribed a specialist treatment by a hospital consultant that is supplied directly to the patient in their own home by a homecare pharmaceutical supplier. The homecare service may include healthcare professional support (specialist nurse support) for the administration of the homecare product. Details of the treatment will be made available to community healthcare professionals via a discharge advice note from the hospital. Homecare may be concerned with the provision of specialist drugs, but may also deal with the supply of ostomy products or enteral feeds.

At the current time, homecare is a separate silo to healthcare provided by other providers and there are many variations in practice and governance with homecare supply systems.

There are a number of successful outcome criteria for a homecare service:

- Provision of a safe, effective homecare treatment service
- There are good communications and all healthcare professionals involved in patient care know what has been supplied within homecare arrangements.
- Continuity of cover of homecare supplies
- Systems in place for updating homecare records in a timely and accurate way

Appliances

Medical devices and appliances may be supplied by pharmacists but also by other suppliers and delivery services (e.g. appliance contractors). A wide variety of people, other than the patient and the lead healthcare professional, may be involved with the use of a device, or need to know about a device. These might include: practice nurses, specialist nurses, carers and relatives, nutritionists and dieticians (stoma etc), physiotherapists, occupational therapists, other AHP, teaching staff (with children and young people) and various others.

Devices might include:

- Ostomy bags and consumables
- Catheters
- Dressings
- Nebulisers

The usual pattern is that diagnosis, surgery or acute treatment occurs in hospital and first fitting or use of the device takes place in hospital (either before discharge or at a subsequent outpatient appointment, if the device/appliance needs to be ordered).

Once the patient is discharged, the appliance or device may be used in any community setting. Routine assessments and supplies of devices will take place during working hours, but there may be out-of-hours queries (patient use queries, emergency cases or complications). Specialist suppliers may take over patient supplies

on a longer term basis, and the danger is that the patient's progress is not then reviewed by the pharmacist or other healthcare professional.

The success criteria for the supply and use of devices and appliances are:

- Seamless provision of the correct device and ancillary equipment
- Minimum waste
- Single point of contact for the patient
- Underlying condition is controlled with minimum complications
- Emergencies/unexpected situations can be dealt with easily

Patient Group Direction (PGD) Supply

The Patient Group Direction (PGD) is a means of supplying or administering a prescription only medicine without an individual prescription. While a record of supply should be made, the PGD supply can take place on a confidential basis (e.g. with Emergency Hormonal Contraception). The purpose of PGDs is to widen patient access to treatment in areas where there are specific public health needs.

PGD supply may take place in a number of settings, for example, the patient's home, a walk in clinic or a residential home, not just in the pharmacy.

Public Health and Screening

Pharmacists may be involved in local public health or disease screening initiatives. These initiatives are designed to improve health and screen for disease in hard-to-reach groups of the population or people who do not go to see their GP.

These people may not have health records stored elsewhere in the health service so the recording of intervention information with these services is particularly important.

These services may take place in a wide variety of settings in order for them to be accessible to patients. These might include pharmacies, but also community centres, village halls, pubs, places of worship etc. Because of the variety of settings, IT access may not always be possible and pharmacists involved with such initiatives should consider carefully the way in which information might be recorded and stored. These services are likely to take place in an opportunistic way, as directed by the local payor or provider. The unique aspect of these services for pharmacists is that they are not medicines driven.

Home Visits

The pharmacist or member of pharmacy staff visits a patient at their own home for one or more reason. The visit may be because the patient is housebound, but may also be association with a delivery service.

Conclusions

Electronic health records (EHRs) for patients facilitate improved access to patient records for health professionals and patients alike. However, as they contain personal identifiable information, EHRs are subject to stringent confidentiality and information governance requirements and an appropriate consent model and ethical framework of use for EHRs is essential. Due to increased accessibility of the patient information on the EHR and the potential for the data to be manipulated for specific purposes or instantiated into other healthcare IT applications, EHRs may be used for improving quality of care and leveraging new services and new ways of working. National care record services may have considerable benefits in providing consistency of patient care and making basic information available to facilitate emergency treatment. However, the relationship of national to local care records is one that requires further research and experience. For all aspects of pharmaceutical care to be supported by EHRs, there is a need to develop a standard format and content for a pharmaceutical care record. This may require considerable work to develop a record structure that supports all aspects of pharmaceutical care in a patient-centred manner and in a way that is consistent with other patient record development initiatives.

References

1. Sjoborg B, Backstrom T, et al. Design and implementation of a point-of-care computerised system for drug therapy in Stockholm metropolitan health region – bridging the gap between knowledge and practice. *Int J Med Inform.* 2007;76:497–506.
2. For example, the Umbrian regional healthcare system in Italy (see Barbarito F. Regional service card health and social care information system. Presented at opportunities in e-Health, London, 30 Nov 2006).
3. Department of Health. Confidentiality: NHS code of practice. 2003. http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4069253. Accessed January 2012.
4. General Pharmaceutical Council. Guidance on patient confidentiality. 2012. http://www.pharmacyregulation.org/sites/default/files/Guidance%20on%20Confidentiality_April%202012.pdf. Accessed January 2012.
5. General Pharmaceutical Council. Guidance on consent. 2012. <http://www.pharmacyregulation.org/sites/default/files/GPHC%20Guidance%20on%20consent.pdf>. Accessed January 2012.
6. Pharmaceutical Services Negotiating Committee, Royal Pharmaceutical Society, NHS Employers. NHS information governance: pharmacy contractor workbook. 2010. http://www.psn.org.uk/data/files/IG/psnc_ig_workbook_2010web.pdf. Accessed January 2012.
7. RCGP Informatics Group. Shared record professional guidance report. 2009. http://www.rcgp.org.uk/pdf/Health_Informatics_SRPG_final_report.pdf. Accessed January 2012.
8. Royal College of Physicians. Developing standards for the structure and content of health records. London. 2008. www.rcplondon.ac.uk/clinical-standards/hiu/medical-records. Accessed January 2012.
9. National Information Governance Board. NHS care records guarantee. <http://www.nigb.nhs.uk/guarantee/2009-nhs-crg.pdf>. Accessed January 2012.

10. The NHS Constitution. 2010. <http://www.nhs.uk/choiceintheNHS/Rightsandpledges/NHSConstitution/Documents/nhs-constitution-interactive-version-march-2010.pdf>. Accessed January 2012.
11. Information Commissioner's Office. Subject access to health records by members of the public. 2010. http://www.ico.gov.uk/for_organisations/sector_guides/health.aspx. Accessed January 2012.
12. Royal College of General Practitioners. RCGP records access guide for GPs: sharing records with patients – an evolving process. 2010, v1. http://www.rcgp.org.uk/pdf/Health_Informatics_RecordAccessGPGuide.pdf. Accessed January 2012.
13. Department of Health, Royal College of General Practitioners, British Medical Association. The good practice guidelines for GP electronic patient records. 2011, v4, p. 174. <http://www.connectingforhealth.nhs.uk/systemsandservices/infogov/links/gpelec2011.pdf>. Accessed January 2012.
14. Shane R. Computerised physician order entry: challenges and opportunities. *Am J Health Syst Pharm*. 2002;59:286–8.
15. Graez I, Reed M, et al. Care coordination and electronic health records: connecting clinicians. *AMIA Annu Symp Proc*. 2009;2009:208.
16. Khoury AT. Support of quality and business goals by an ambulatory automated medical record system in Kaiser Permanente of Ohio. *Eff Clin Pract*. 1998;1:73–82.
17. Marshall PD, Chin HL. The effects of an electronic medical record on patient care: clinician attitudes in a large HMO. *AMIA Annu Symp Proc*. 1998;150–4.
18. Scott RT, Rundall TG, et al. Kaiser Permanente's experience of implementing an electronic medical record: a qualitative study. *Br Med J*. 2005;331:1313–6.
19. Simonaitis L, Belsito A, et al. Aggregation of pharmacy dispensing data into a unified patient medication history. *AMIA Annu Symp Proc*. Nov 6, 2008;1135.
20. Smith B. Presented at the guild of Healthcare Pharmacists/United Kingdom clinical pharmacy association Information Technology Interest Group (ITIG) Seminar, Birmingham, Nov 2009. <http://www.ghp.org.uk/ContentFiles/ghpitig0911e.pps>.
21. Boockvar KS, Livote EE, et al. Electronic health records and adverse drug events after patient transfer. *Qual Saf Health Care*. 2010;19:e16.
22. Hurdle JF, Weir CR, et al. Critical gaps in the world's largest electronic medical record: ad hoc nursing narratives and invisible adverse drug events. *AMIA Annu Symp Proc*. 2003;2003:309–12.
23. Smith DH, Perrin N, et al. The impact of prescribing safety alerts for elderly persons in an electronic medical record: an interrupted time series evaluation. *Arch Intern Med*. 2006;166:1098–104.
24. Orrico KB. Sources and types of discrepancies between electronic medical records and actual outpatient medication use. *J Manag Care Pharm*. 2008;14:626–31.
25. Mohamed IN, Helms PJ, et al. Using primary care prescribing databases for pharmacovigilance. *Br J Clin Pharmacol*. 2011;71:244–9.
26. Buck MD, Atreja A, et al. Potentially inappropriate medication prescribing in outpatient practices: prevalence and patient characteristics based on electronic health records. *Am J Geriatr Pharmacother*. 2009;7:84–92.
27. Roten I, Marty S, et al. Electronic screening of medical records to detect inpatients at risk of drug-related problems. *Pharm World Sci*. 2010;32:103–7.
28. Berbatis CG, Sunderland VB. Linked electronic medication systems in community pharmacies for preventing pseudoephedrine diversion: a review of international practice and analysis of results in Australia. *Drug Alcohol Rev*. 2009;28:586–91.
29. Frenzel JE. Using electronic medical records to teach patient-centered care. *Am J Pharm Educ*. 2010;74(71).
30. Santana S, Lausen B, et al. Online communications between doctors and patients in Europe: status and perspectives. *J Med Internet Res*. 2010;12:e20 Accessed January 2012.
31. Montelius E, Astrand B, et al. Individuals appreciate having their medication record on the web: a survey of attitudes to a national pharmacy register. *J Med Internet Res*. 2008;10:e35.

32. Roblin DW, Houston TK, et al. Disparities in use of a personal health record in a Managed Care Organisation. *J Am Med Inform Assoc.* 2009;16(5):683–9.
33. Singleton P, Pagliari C, et al. Critical issues for electronic health records: considerations from an expert workshop, Wellcome Trust/Nuffield Trust, London, 2007.
34. Barnett J, Jennings H. Pharmacy information systems in Canada. *Stud Health Technol Inform.* 2009;143:131–5.
35. Linder JA, Schnipper JL, et al. Electronic health record feedback to improve antibiotic prescribing for acute respiratory infections. *Am J Manag Care.* 2010;16:e311–9.
36. EC Information Society & Media. The socio-economic impact of intra-operable electronic health record (EHR) and e-prescribing systems in Europe and beyond: final study report. 2009.
37. Brennan N, Mattick K, et al. The map of medicine: a review of evidence for its impact on healthcare. *Health Info Libr J.* 2011;28:93–100.
38. Smith L, McGowan L, Moss-Barclay C, Wheeler J, Knass D, Chrystyn H. An investigation of hospital-generated pharmaceutical care when patients are discharged home from hospital. *Br J Clin Pharmacol.* 1997;44(2):163–5.
39. Blagburn J, Acomb C. Implementing and evaluating evidence based clinical pharmacy for older people admitted to a secondary care trust. Presented at UKCPA. 2008.
40. Royal Pharmaceutical Society of Great Britain. Guidance on recording interventions. 2006. Available from the Royal Pharmaceutical Society, 1 Lambeth High Street, London, SE7 4JN, UK
41. Schnipper JL, Hamann C, et al. Effect of an electronic medication reconciliation application and process redesign on potential adverse drug events: a cluster randomised trial. *Arch Intern Med.* 2009;169:771–80.



<http://www.springer.com/978-1-4471-2779-6>

Information Technology in Pharmacy

An Integrated Approach

Goundrey-Smith, S.

2013, XII, 240 p., Hardcover

ISBN: 978-1-4471-2779-6