



ROYAL
PHARMACEUTICAL
SOCIETY

Updating the RPS Professional Standards for Hospital Pharmacy 2017 – Literature Review



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1. Introduction

The RPS Professional Standards for Hospital Pharmacy were originally published in 2012 so this literature review looks at the key changes since then. The professional standards were revisited in 2014 in light of the findings from the Francis Review of events at Mid Staffordshire Foundation Trust¹ and the response to that review, the report of the National Advisory Group on the Safety of Patients in England (commonly referred to as the Berwick report²). The RPS hospital pharmacy standards update in 2014 also ensured that they aligned with developments in pharmacy and healthcare agendas in Scotland and Wales.

Reports such as Keogh³, Berwick² and Trusted to Care⁴ shaped the approach to healthcare provision in the UK and increased the emphasis on patients – adding ‘patient experience’ to the cornerstones of ‘patient safety’ and ‘patient wellbeing’.

The relevant legislative documents will be listed in an update to the Handbook for Hospital Pharmacy Standards⁵, including the Human Medicines Regulations 2012⁶ that were published following a review and consolidation of the Medicines Act 1968⁷. Changes to legislation and regulation followed the Francis Review. A duty of candour, requiring openness and honesty, is already a statutory requirement in England⁸ and guiding regulations will establish this as a legal duty in Scotland (April 2018)⁹. There is increased emphasis on person-centred professionalism for healthcare professionals, including pharmacy, with updates to the standards of practice required by professional, regulatory and other bodies¹⁰⁻¹³.

The 2014 update to the RPS hospital pharmacy standards increased the emphasis of key themes such as the need to increase patient involvement and feedback in the development, delivery and improvement of pharmacy services. The importance of organisational culture and the need to provide services in a candid, transparent and open way in an environment that supports continuous learning was also given more focus¹⁴.

This review does not include guidance on the handling of medicines or their clinical use as this is covered elsewhere*.

*During 2017 there is a separate multidisciplinary piece of work, with leadership provided by the Royal Pharmaceutical Society, to update “The safe and secure handling of medicines: a team approach”.

In 2017 there is an increasing emphasis on integrated care and clinical pharmacy to provide better patient outcomes¹⁵⁻¹⁹. There has been much activity relating to professional development programmes and competency frameworks. The landscape for delivering hospital pharmacy services is explored further in the review.

2. Literature review - method

2.1 Primary research question

What has changed since the RPS hospital pharmacy standards were last published? Are there any new or updated hospital pharmacy standards (or related standards)? Identify key service developments (especially new roles or service innovation). What are the changes to the hospital pharmacy landscape? Is there any area of practice covered by the existing standards that may no longer be applicable (no longer relevant)?

2.2 Search strategy

A scoping methodology was used to identify suitable material. This included systematic searching to identify key updates as described in the RPS standards, guidance and frameworks process development manual²⁰. The Four online databases (MEDLINE Complete, CINAHL Complete, International Pharmaceutical Abstracts, Biomedical Reference Collection: Corporate – EBSCOhost) were systematically searched to identify English language articles, published between 2012 to date, which identify what is known about hospital pharmacy services – in relation to the current landscape, with a focus on standards and/or quality measures of performance that impact on services to patients. This was a broad search to describe the nature and extent of the evidence. The search terms were orientated towards clinical roles rather than the medicines supply function. Once the studies had been assessed as

meeting the inclusion criteria, and so suitable for inclusion in our review, we looked at the relevance to addressing the research question and their quality.

A search of the 'grey literature', included the NHS England²¹, NHS Scotland²² and NHS Wales²³ websites, to identify drivers for change. In addition, regulatory website were trawled including the General Pharmaceutical Council²⁴, Care Quality Commission²⁵, Healthcare Inspectorate Wales²⁶ and Healthcare Improvement Scotland²⁷. NHS Resolution¹³, NHS National Services Scotland²⁸ and Shared Services Partnership Wales: Legal and Risks Service²⁹ were also included.

The International Pharmaceutical Federation^{30,31} and the European Association of Hospital Pharmacists^{32,33} have produced hospital pharmacy standards so their websites were searched. The Royal Pharmaceutical Society³⁴, Specialist Pharmacy Services³⁵, National Institute for Health and Care Excellence³⁶ and Scottish Intercollegiate Guidelines Network³⁷ websites were searched to identify relevant standards and guidelines.

The grading of the evidence is based on Scottish Intercollegiate Guidelines Network (SIGN) criteria and described in the RPS standards development process manual²⁰.

The main inclusion criteria are:

Emphasis of a reference is the provision of hospital pharmacy services* for patient care. A reference's focus is strategic. English language articles. Specified geographical location (UK, EU, Canada, USA, Australia, New Zealand). Publication year 2012 to date.

*References on standards/best practice for delivery of services to patients in hospice, prison, ambulance and mental health services were to be included (but a possible limitation of our search methodology is that not all references on delivery from secondary care to other settings may be located by our broad search concepts/terms [especially if there is a lack of published literature]).

Study design:

All study designs were considered for the review

The main exclusion criteria are:

References to practice already covered by the existing RPS hospital pharmacy standards (where no potential update is identified)

Studies examining medicines or clinical usage of medicines

Non-strategic (eg, an examination of process/procedures for individual services)

Non-English language

Search terms –

The search strategy is described for Medline (corresponding keyword or subject headings used for searching the 3 other database(s) are listed separately). The search fields were title [TI], abstract [AB] and subject heading [MH] (or equivalent keyword field(s)). The search was limited to articles published in English from January 2012 to April 2017.

1. "hospital pharmacy" [TI, AB] OR "hospital pharmacies" [TI,AB] OR "pharmacy service, hospital" [MH] OR ("pharmaceutical services" [MH] AND (hospital [TI, AB] OR hospitals [TI, AB, MH]))

Search step 1 was combined using "AND" for each of these steps:

2. "Quality" [TI,AB] OR "standard(s)" [TI, AB] OR "benchmarking" [MH] OR "key performance indicator(s)" [TI, AB] OR "leadership" [TI,AB,MH]

3. "medicines optimi?ation" [TI,AB] OR "pharmaceutical care" [TI,AB] OR "clinical pharmacy" [TI,AB] OR "patient transfer" [MH] OR "delivery of healthcare, integrated" [MH] OR "integrated care" [TI, AB] OR "patient care team" [MH] OR "patient safety" [MH]

4. "patient satisfaction" [MH] OR patients [MH] OR "patient experience" [TI, AB]

5. "informatics" [TI,AB,MH] OR "technology" [TI,AB, MH]

A text search was also undertaken for:-

6. "Basel statements" [TX] OR "European statements" [TX].

[TX = all text]

Corresponding search terms (subject headings or keywords):

CINAHL Complete [subject heading, MH] ("pharmacy service" AND ("hospital" OR "hospitals")); "benchmarking"; "clinical indicators"; "leadership"; "transfer, discharge"; ("healthcare delivery, integrated" OR "integrated care"); "multidisciplinary care team"; "patient safety"; ("patient satisfaction" OR "patient experience"); "informatics"; "technology"

International Pharmaceutical Abstracts [subject heading, SU] ("pharmacy services" AND "hospitals"); "benchmarking-hospital pharmacy"; "leadership"; ("*transitions of care*" OR "transfer of care"); "clinical pharmacy"; "integrated care"; "interventions pharmacy"; "multidisciplinary team"; "patient safety"; ("*patient satisfaction*" OR "patient experience"); informatics; technology

Biomedical Reference Collection [keyword, KW; Subject heading, SU] "hospital pharmacy"; "hospital pharmacies"; "quality"; "benchmarking (management)"; "key performance indicators (management)"; "leadership"; ("*transitions of care*" OR "transfer of care"); "integrated care"; "multidisciplinary"; "patient safety"; "patients-safety measures"; ("patient satisfaction" OR "patient experience"); "informatics"; "technology".

Where the database(s) did not have a keyword or subject heading that corresponded with the Medline subject heading term [MH] the additional terms used to search the title and abstract are shown in *Italics*.

For these 3 databases - a limited number of search results found when search step 3 was combined with search step 1 so "hospital", "hospitals" were added to search step 1 to broaden the search.

2.3 Results

The search generated 2,373 references. Initial selection was based on the title and abstracts and 49 papers were identified as suitable for full review. Refinement was based on the inclusion and exclusion criteria and removal of duplicates. 2,258 references were removed. The results are presented by the themes identified within the literature.

102 references were descriptive/non-analytical (narrative reviews, expert opinion, case report or case series, cross-sectional descriptive study, service evaluation) and 13 references were analytical/experimental (including 8 systematic reviews of randomised controlled trials, 3 randomised controlled trials, 2 observational cohort studies).

An additional 2 studies (descriptive/non-analytical) were identified following intelligence from steering group members who provided feedback on an initial draft of the literature review.

3 Discussion

3.1 Legislation and regulation

In terms of legislation, it is the changes 'on the horizon' that are expected to impact significantly on hospital pharmacy services. In the United Kingdom, work on the Medicines Act around supervision aims to enable new ways of working by rebalancing of medicines legislation with regulations that affect pharmacy practice, so that it is fit for purpose. This provides less emphasis on dispensing/supply and will enable increased clinical pharmacy activities. A consultation on dispensing errors in hospital pharmacy and on superintendent pharmacist and responsible pharmacist roles is due. A report from the Hospital Pharmacy Expert Advisory Group to the Rebalancing Medicines Legislation and Pharmacy Regulation Programme³⁸ sets out the context and conclusions of a UK-wide review of governance in the hospital pharmacy sector, including the pivotal role of the Chief Pharmacist (or equivalent post).

Legislative changes to decriminalise dispensing errors in pharmacy are due and there has been work before this change to increase the reporting and learning from medication incidents, including the publication of professional standards on incident reporting by the Royal Pharmaceutical Society, Pharmacy Forum Northern Ireland and Association of Pharmacy Technicians UK³⁹.

There are national frameworks for learning from adverse events through reporting and review³⁹⁻⁴¹.

Keypoint (for standards review): Include the professional standard on incident reporting under standard 6 'Safe use of medicines', dimension 6.2 'Safety culture'. It is proposed that the standards review team consider inserting a sentence after "Senior pharmacists must be party to, or lead on Serious Incidents (SIs) involving medicines". Insert - "Medication incidents, including medication errors, side effects of a medicine, defective and counterfeit medicines, medical device incidents are reported following professional standards¹⁶ and processes for national reporting". Followed by - "Local systems and processes are in place to ensure all medication errors (including 'omissions') are identified, recorded, monitored, appropriately reported and investigated".

It is considered that the UK's planned departure from the EU does not remove the need to comply with the Falsified Medicines Directive 2011/62/EU^{42,43} and its delegated Act that provides for serialisation so suppliers and healthcare institutions will need to scan the 2D barcodes on medicines' packaging to improve the traceability of products (due to be implemented by February 2019. See 'Developments in digital technology and informatics' section – 3.12) or the Clinical Trials Regulation EU No. 536/2014⁴⁴ (due to be implemented in 2018).

Increased harmonisation of the clinical trials legislation could lead to more clinical research and opportunities for pharmacy. New medicine technologies will impact on pharmacy, for example, biosimilars, personalised medicines, cell and gene therapy. The impact of Brexit on research funding is not yet known. (More details are available in the 'New medicine technology' section – 3.15).

The role of Controlled Drugs Accountable Officer (CDAO) is not new (first established in 2006) but in 2013 there were significant changes with the introduction of new regulations⁴⁵ that give the CDAO more flexibility on discharging their duties and functions in relation to controlled drugs. The role is not only procurement and supply of CDs but also monitoring and oversight to ensure safe practices.

Keypoint (for standards review): It is proposed the role of Controlled Drugs Accountable Officer is included under standard 9 'Governance and financial management', dimension 9.1 on 'Systems governance' to expand on the sentence on "governance arrangements" by adding a requirement to report any concerns about controlled drugs to the Controlled Drugs Accountable Officer (CDAO) (or for smaller organisations without a CDAO to another identifiable lead person).

There are key changes anticipated to EU data protection legislation, with increased emphasis on the importance of explicit consent for the sharing of confidential information⁴⁶. A new EU Regulation on data privacy must be implemented across EU member states by May 2018. Integrated health and social care relies on access to patient information and the sharing of data. (More details are available in the 'Developments in digital technology and informatics' section – 3.12).

The General Pharmaceutical Council has updated its guidance on consent, with additional requirements on informed consent – to make sure the person knows about 'material risks'⁴⁷. This follows a legal judgement (Montgomery vs Lanarkshire Health Board)⁴⁸. 'Material risks' are those a reasonable person would think are significant in the circumstances, but also those the particular person would find significant.

Integrated healthcare, with greater collaboration between different care providers, is a key theme emphasised across all three countries.

3.2 Drivers for change – policy direction England

A Hospital Pharmacy Transformation Programme was formed as a result of the Carter Report on efficiency savings and unwanted variations in productivity and performance in English NHS hospitals⁴⁹. All acute trusts are required to produce a Hospital Pharmacy Transformation Plan on how, by 2020, they will reduce unwanted variations and improve productivity and efficiency. Work is being undertaken to develop a 'Model Hospital' and associated metrics, including top 10 medicines, activities of pharmacist prescribers, number of antimicrobial pharmacists, hours of service – with a Model Hospital dashboard to enable comparisons between organisations⁵⁰.

Three priority projects are:

- Medicines optimisation
- Developing the Model Hospital and associated metrics
- Infrastructure projects (including a review of all non-clinical pharmacy services to identify those that might be delivered differently in the future).

Methods of delivering non-clinical pharmacy services differently include outsourcing of medicines supply and consolidation of some services with an aim to free up resource to focus on clinical services.

The RPS Hospital Expert Advisory Group has developed definitions for benchmarking metrics relevant to acute hospitals and for use by hospital pharmacy teams across Great Britain. The aim is to provide a consistent basis for the collection of data which will allow acute hospitals to benchmark performance against each other most effectively⁵¹.

Operational productivity in Community Health Service organisations ("Carter 2") is due to be published in Autumn 2017⁵².

NHS RightCare is a programme of work in England that aims to reduce unwanted variation and medicines optimisation is a crucial element of NHS RightCare's innovation work⁵³.

Medicines optimisation focuses on value rather than costs. The Royal Pharmaceutical Society has produced good practice guidance detailing four guiding principles for medicines optimisation⁵⁴. These are:

1. Aim to understand the patient's experience
2. Evidence-based choice of medicines
3. Make sure medicines use is as safe as possible
4. Make medicines optimisation part of routine practice

A medicines optimisation dashboard, first launched in 2014 by NHS England, is based on the medicines optimisation principles and includes a hospital trust dashboard with corresponding metrics. Relevant medicines optimisation documents will be listed in an update to the Handbook for Hospital Pharmacy Standards⁵.

In 2017 the work of four Regional Medicines Optimisation's Committees will begin with a key objective of achieving best value and patient from all medicines by helping to eliminate unnecessary duplication of effort from the area prescribing process⁵⁵.

NHS England has a five year forward strategy document⁵⁶ that looks at the next steps and a current workforce crisis in primary care and emergency care which can be partially addressed by pharmacy. NHS Improvement is working with hospitals to consolidate pharmacy infrastructure such as medicines stores across wider geographies to deliver further efficiencies and free up pharmacists' time for clinical work. Clinical work will help to drive efficiencies in the use of medicines. The need for more integrated care is highlighted, including services need to be integrated around the patient with an increase in out-of-hospital care.

An NHS England report on seven day hospital clinical pharmacy services supports delivery of the 10 seven day clinical standards as set out by the NHS Services, Seven Days a Week Forum and the Hospital Pharmacy Transformation Programme (HPTP) - as set out by Lord Carter's recent report⁵⁷.

The Nuffield Trust's independent assessment on the recommendations in the "Now or Never" report considered progress alongside the NHS England Forward View. NHS England's new models of hospital-led integrated care providers mean hospital pharmacists need to be ready to think about how they could coordinate pharmaceutical care services across a local health system⁵⁸.

The Care Quality Commission introduced a new inspection framework in 2015¹⁰ and references on this will be included in an update to the Handbook for Hospital Pharmacy Standards⁵. In 2015 the “Fundamental standards” replaced “Essential standards” and introduced the “duty of candour” and a “fit and proper person” requirement for directors. CQC inspections are based on an assessment tool (using Key Lines of Enquiry, KLOEs) with a set of questions on 5 key components:

- Safety
- Effectiveness
- Caring
- Responsiveness
- Leadership

NHS Improvement has published a single oversight framework⁵⁹ which covers 5 themes, which are linked to CQC's questions but are not identical.

- Quality of care (safe, effective, caring, responsive)
- Finance and use of resources
- Operational performance
- Strategic change
- Leadership and improvement capability.

3.3 Drivers for change – policy direction Scotland

Since 2013 there has been “Prescription for Excellence”, the Scottish government’s vision on improving pharmaceutical care through integrated partnerships and innovation⁶⁰. A refresh is being worked on and it is expected to be relaunched soon. An overriding objective is that all patients, regardless of their age and setting-of-care, will receive high quality pharmaceutical care using the clinical skills of the pharmacist to their full potential.

A priority in Scotland is to bridge the gap between health and social care. Increased integration and collaboration is already a reality in Scotland, with a new framework introduced for integrating health and social care⁶¹. The Scottish Patient Safety Programme (SPSP) includes a whole-system approach to medicines reconciliation^{62,63,64}. The Scottish Government’s vision is that by 2020 everyone is able to live longer healthier lives at home, or in a homely setting⁶⁵.

The Chief Medical Officer for Scotland has reported on ‘Realistic Medicine’⁶⁶ and ‘Realising Realistic Medicine’⁶⁷ which describe the challenges facing doctors and the aim to make it easier across the healthcare system to ‘do the right thing’ for patients which includes being ‘realistic’ and sensible about what can be achieved, also reducing over-treatment and waste. This is not solely about doctors and the delivery of realistic medicine is a multi-professional endeavour. The vision is that, by 2025, everyone who provides healthcare in Scotland will demonstrate their professionalism through the approaches, behaviours and attitudes of realistic medicine. A National Clinical Strategy for Scotland also discusses the need for realistic medicine⁶⁸.

Everyone Matters, a 2020 workforce vision for NHS Scotland with an implementation plan and routemap^{65,69,70}, describe the values that are shared across Scotland’s Health Service - care and compassion; dignity and respect; openness, honesty and responsibility; quality and teamwork. The 2020 vision provides the strategic narrative and context for taking forward the implementation of a quality strategy⁷¹.

Following a review on access to newly licensed medicines, an initiative to develop a “single National Formulary for NHS Scotland” is to be further explored⁷².

The Directors of Pharmacy (DOPs) Group supported the National Acute Pharmacy Service Group (NAPS) have reviewed the Carter report, which was written for English acute hospitals, and made specific recommendations of relevance for Scottish acute hospitals from a pharmacy service perspective⁷³. A core dataset to use for KPIs, quality improvement, business case development and benchmarking and the potential for dashboard development is to be explored for acute pharmacy services across Scotland. The Prescription for Excellence programme must enable the delivery of electronic capability, including transfer of information across interfaces. See ‘Developments in digital technology’ section – 3.12.

3.4 Drivers for change – policy direction Wales

The Trusted to Care report on failings in care at two hospitals in Wales describes the need for health care staff, including pharmacy staff, to be reconnected with their personal and professional responsibilities. Its recommendations include a 24/7 approach to services, including pharmacy services⁴.

Personalised pharmaceutical care plans are part of the vision for patient-centred care in Wales described in joint work between the RPS and Welsh Pharmaceutical Committee. Other new ways of working include seven day services, integration of pharmacy into all multidisciplinary hospital and community teams, use of new technologies to improve communication⁷⁴.

1000 Lives Improvement is the national improvement service for NHS Wales delivered by Public Health Wales. This aims to support the NHS to improve outcomes for people using services in Wales⁷⁵. 1000 Lives Improvement is supporting NHS Wales to take forward prudent healthcare, which includes value-based healthcare and aims to empower people to maximise their own wellbeing⁷⁶.

3.5 New standards for hospital pharmacy services

3.5.1 New international hospital pharmacy standards

The literature search identified new hospital pharmacy standards (or standards relevant to hospital pharmacy services). There has been a large programme of work undertaken by the International Pharmaceutical Federation (FIP) to produce hospital pharmacy standards for use worldwide³¹. Some of the work pre-dates this review and in 2015 there were further updates⁷⁷. A global hospital self-assessment tool helps hospital pharmacies evaluate their practice against the FIP standards, a pilot study supports the validity and reliability of the survey tool⁷⁸. The European Association of Hospital Pharmacists re-worked the FIP standards to make them more applicable to hospital pharmacy practice in Europe⁷⁹.

References describe the methodology to develop the EAHP standards ⁸⁰⁻⁸⁵ .	Level 3
Keypoint (for standards review): The process of creating the European Statements involved patient organisations and healthcare professionals as equal partners, with positive feedback from both groups.	
References describe the methodology to implement the EAHP standards. An online survey of hospital pharmacists in EAHP member countries looked at the main barriers to implementation of the European standards and identified information to target EAHP implementation activities ^{86,87,88} .	Level 3

The literature review also noted that the USA, Canada and Australia have produced standards for pharmacies in hospitals^{89,90,91}. Canada and Australia are advanced in providing data and benchmarking hospital pharmacy activity. The Canadian Society of Hospital Pharmacists publishes an annual report with comprehensive data that enables individual hospital pharmacy services to compare themselves against others across the country⁹².

In USA, in addition to the American Society of Health-System Pharmacy minimum standard for pharmacies in hospitals, the American College of Clinical Practice has Standards of Practice for Clinical Pharmacists. These do not specifically focus on the hospital pharmacy sector⁹³.

Surveys have looked at the Western Pacific region and found that nearly all hospitals provide clinical pharmacy services and a large proportion have well-developed formulary systems^{94,95,96}.

In Australia there is a programme of work to update the Society of Hospital Pharmacists of Australia's (SHPA) standards of practice. There is already comprehensive suite of detailed standards which reflect the move towards clinical pharmacy including: Clinical pharmacy (including medicines reconciliation) (2013); Emergency medicine (2015); Manufacturing (2010); Medication safety (2012); Medicines information (2013); Mental health (2012). The standards also provide guidance on staffing levels required to provide optimal services⁹⁷⁻¹⁰².

3.5.2 Additional standards for delivering hospital pharmacy services

Specific professional standards for optimising medicines for people in secure environments have been developed by the RPS and NHS England Immigration Removal Centres Medicine Improvement Programme Working Group, working with the health and justice sector. These are based on the RPS Hospital Standards, alongside recommendations in the Shaw review ¹⁰³ .	Level 4
Keypoint (for standards review): Include the RPS secure environment standards ¹⁰³ as a reference under 'Introduction'.	
The RPS standards under revision include under scope (section 1.2) the core standards required by system regulators, the NHS Litigation Authority ¹³ (and their equivalents in devolved countries*), the General Pharmaceutical Council ¹² and, for Controlled Drugs, the Home Office. The latest standards for these organisations now highlight a duty of candour.	Level 4
<p>Keypoint (for standards review): The standards review team need to consider some key changes in the scope for the introduction to the standards (section 1.2 of the current document):</p> <ul style="list-style-type: none"> the General Pharmaceutical Council has published revised standards for pharmacy professionals (in effect from 12 May 2017)¹² the NHS Litigation Authority changed its name in 2017 to NHS Resolution¹³ (a modification will be required to reflect the name change). <p>Additional references, including changes to controlled drugs legislation, will be listed in an update to the Handbook for Hospital Pharmacy Standards⁵. The significant role of the Controlled Drugs Accountable Officer is described earlier - see section 3.1.</p>	

*NHS National Services Scotland²⁸ (<https://nhsns.org/services/legal/litigation/>). Shared Services Partnership Wales: Legal and Risks Service²⁹ (<http://www.wales.nhs.uk/sites3/home.cfm?orgid=255>) are the equivalent litigation organisations in Scotland and Wales.

Additional standards are described under the relevant sections.

There has been research undertaken on quality indicators for pharmaceutical care¹⁰⁴ and on pharmaceutical care assessment tools¹⁰⁵.

A systematic review of pharmaceutical care interventions on health-related quality-of-life outcomes found pharmaceutical care interventions can significantly improve at least 1 domain of health related quality-of-life outcomes. A total of 31 randomized controlled trials, 9 nonrandomized studies with comparison groups, and 8 before-after studies were included ¹⁰⁴ .	Level 1+
A service evaluation project to design a pharmaceutical assessment screening tool (PAST) is described. The tool was developed to measure patient acuity and help the pharmacy department prioritise pharmaceutical care but was only used correctly in approximately half of the patients studied. Larger scale studies using validated tools in a more diverse patient population are needed ¹⁰⁵ .	Level 3

In the current standards (under review) there is a note under dimension 2.2 ('Care as an inpatient') that "timing and level of reviews adjusted according to patient need". The targeting of clinical pharmacy support has been further described:

An uncontrolled before-and-after study on eight medical wards in a UK hospital to describe the impact of the pharmacy seeing a drug chart every other day, so the pharmacist has time available to focus on the pharmaceutical needs of newly admitted patients and those with more complex needs. A much larger study would be needed to study the impact on patient outcomes ¹⁰⁶ .	Level 3
A case study describes that NHS Greater Glasgow and Clyde has developed an IT solution, PharmacyView, to allow the clinical pharmacist to visibly record those patients most in need of pharmaceutical care ¹⁰⁷ .	Level 3
Keypoint (for standards review): The targeting of clinical pharmacy support is not new and is already included in the existing standards, an update is not proposed. It is noted that digital developments will provide further opportunities to prioritise clinical pharmacy support for patients. IT developments are further described in sections – 3.9 and 3.12.	

3.6 New or extended roles for pharmacy teams

3.6.1 The pharmacy team within an emergency department

Pilots indicate that new roles could exist for advanced clinical practice qualified pharmacists in emergency departments.

In England, a national study (18,299 patients at 48 sites) was undertaken following initial concept studies in the West Midlands (782 patients – 2 sites). The prospective observational studies confirmed the potential for pharmacists to clinically manage up to 36% of patients in emergency departments, as part of the multidisciplinary team, under the overall supervision of a doctor. These were well-designed observational cohort studies ¹⁰⁸ . Further research is planned to align with a structured training pathway nationally.	Level 2-
A smaller prospective observational study in an American medical centre's emergency department reports on the potential for pharmacists to improve patient care associated with suboptimal prescribing ¹⁰⁹ .	Level 3
A policy statement from the American College of Emergency Physicians states that pharmacists have a critical role in the emergency department. It also encourages clinical research regarding pharmacist access in the emergency department ¹¹⁰ .	Level 4
In 2013 a national survey in Canada showed that the establishment of ward-based pharmacy services in Canadian emergency departments had increased ¹¹¹ . Medication reconciliation practices were also described ¹¹² .	Level 3
As a result of the lack of evidence nationally and internationally regarding pharmacists clinically managing patients, HEE West Midlands (HEE-WM) and its national partners began a three-year research programme in 2013. A national cross-sectional observational study of 18,299 patients attending the emergency department at 48 sites describes that paediatric patients attending Emergency Departments were judged by pharmacists to be suitable for management outside a hospital setting in approximately 1 in 11 cases, and by hospital independent prescriber pharmacists in 4 in 10 cases ^{113,114} .	Level 3
An Australian prospective study measured pharmacist activities and surveying emergency department staff attitudes and experience before and after commencement of an emergency	Level 3

department pharmacy service. Pharmacy staff can rapidly become a vital component of clinical service provision in an emergency department ¹¹⁵ .	
Further reviews describe the role of the emergency department pharmacist ^{116,117} .	Level 4

There are studies that show the ability of pharmacy technicians to obtain medication histories and relieve pressures on the emergency department ^{118,119} .	Level 2-
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In Australia there are standards of practice in emergency medicine pharmacy⁹⁹.

3.6.2 Pharmacists role in ambulatory care

Ambulatory care in pharmacy has a long history, with many references that pre-date this review. However, with an increased emphasis on care outside of hospital, especially in the 'grey literature' this is noted as an area for further consideration. Delivering the right care in the right place continues to be a priority throughout the UK. There is a drive to avoid unnecessary hospital stays and to manage more patients in their home. This is included in NHS England's Five Year Forward View, NHS Scotland's 'Everyone matters – 2020 workforce vision'⁶⁵ and in the prudent approach to health in Wales⁷⁶.

A briefing paper reviews ambulatory care in pharmacy practice (integrated accessible care) and its historical successes since the 1960s ¹²⁰ .	Level 4
UK and international literature have different definitions of ambulatory care but highlight that it is care and rehabilitation often not provided within the traditional hospital bed base ¹²¹ .	Level 4
The 'grey literature' search identified additional reports which include ambulatory care, including the Royal College of Physicians work on future hospital care which describes a focus on ambulatory (day case) emergency care and acute care hubs ¹²² .	Level 4
Keypoint (for standards review): The RPS professional standards, standard 2 'Episode of care', dimension 2.4, already provides for patients who are not admitted to hospital. The 'grey literature' described throughout this review shows that in health and social care sometimes the patient's own home is considered the 'best hospital'. It is suggested that the standards review team consider increasing the emphasis on the importance of care outside of hospital for this standard (More details on new roles that extend beyond 'the walls of pharmacy' are available in the 'integrated care' section – 3.8).	

In USA, the American Society of Health-System Pharmacy has published standards for ambulatory care pharmacy practice¹²³.

It has been announced that, as part of the Chemotherapy Services Review, chemotherapy 'dose banding' is to be rolled-out in England. This will enable standard 'single serve' chemotherapy doses to be delivered in a range of community and health settings other than hospital that would be closer to people's homes. This will reduce bespoke pharmacy preparation. Purchasing could be outsourced or arranged in collaboration with other Trusts, to achieve efficiencies¹²⁴.

Ambulatory care pathways include the management of pulmonary embolism as an outpatient (British Thoracic Society guidelines, currently in preparation)¹²⁵.

Ambulatory care is covered throughout this review, including sections 3.8 ('Integrated care'), 3.9 ('Transfer of care'), 3.6.7 ('Mental health'), 3.1.2 ('Developments in digital technology and informatics').

3.6.3 Antimicrobial pharmacist

The 'grey literature' identifies antimicrobial stewardship is an important public health priority¹²⁶⁻¹²⁹. A strategy has been developed collaboratively with the UK devolved administrations to tackle the issue of antimicrobial resistance¹³⁰. The TARGET Antibiotics toolkit (England)¹³¹ is a resource that will be included in the update to the Hospital Pharmacy Standards Handbook, with details on a number of national strategies and guidance including:

The English Surveillance Programme for Antimicrobial Utilisation and Resistance ¹³² .
NICE guidance on antimicrobial stewardship ¹²⁷ .
Welsh Antimicrobial Resistance Programme ¹³³ .
Scottish Antimicrobial Prescribing Group ¹³⁴ . Healthcare Improvement Scotland Healthcare Associated Infection (HAI) standards ¹²⁸ .

The literature search identified antimicrobial stewardship as an important theme. The search strategy (see section 2.2) was not powered to retrieve all the literature on this specific topic. The search results show:

A multidisciplinary team, including pharmacists, at a Spanish hospital undertook a 12-month programme that targeted the use of voriconazole, caspofungin and liposomal amphotericin. A review of prescription figures showed they achieved a 11.8% reduction in antifungal expenditure without reducing the quality of care provided ¹³⁵ .	Level 3
In the UK a prospective observational 12-month study at a tertiary hospital targeted the use of antifungals and the descriptive data illustrates the added value of antimicrobial stewardship programmes and the quantity of antifungal prescribing and a possible reduction of costs ¹³⁶ .	Level 3
Keypoint (for standards review): An emerging area of interest, with limited evidence, is antifungal stewardship programmes.	

An international survey reported on the extent and components of global efforts in antimicrobial stewardship (AMS) in hospitals. Antimicrobial programmes included pharmacist participation. A total of 89% of programmes educated their medical, nursing and pharmacy staff on AMS ¹³⁷ .	Level 3
A survey of pharmacists in NHS hospitals found that an increasing role of specialist pharmacists and general pharmacists in antibiotic stewardship in acute care in England has enabled hospitals to deliver on the antibiotic stewardship agenda. The prospective measurement of well-defined outcomes of the impact of this role is a challenge ¹³⁸ .	Level 3
Antimicrobial pharmacists are key members of the antimicrobial management team in Scotland and the establishment of a national antimicrobial stewardship programme has made a significant contribution to the healthcare-associated infections agenda. National surveillance data shows a reduction in antimicrobial prescribing and its impact on <i>Clostridium difficile</i> infection ¹³⁹ .	Level 3
A recent international report on the impact of a national antimicrobial stewardship programme describes the benefits of a interprofessional mentorship program to advance antimicrobial stewardship in selected US hospitals ¹⁴⁰ .	Level 3
Keypoint (for standards review): The role of the pharmacist in antimicrobial stewardship is included in USA standards ⁶⁷ . Pharmacists can have a leadership role in antimicrobial stewardship and infection prevention	

and control, working with multidisciplinary antimicrobial stewardship teams. It is proposed the standards review team consider a modification of the RPS standards to include mention of antimicrobial stewardship.

3.6.4 Pharmacist prescribers

The uptake of pharmacist prescribing in different settings is widely reported.

The 'grey literature' search identified literature on polypharmacy ¹⁴¹⁻¹⁴⁵ with an increased focus on 'deprescribing' and stopping medicines. In 2016 the RPS published a prescribing competency framework for all prescribers ¹⁴⁶ . A literature search on 'de-prescribing' identified evidence and proposed this topic was included in the RPS prescribing competency framework ¹⁴⁷ .	Level 4
Deprescribing is feasible and can be done safely ¹⁴⁸	Level I++
Keypoint (for standards review): Multimorbidity and polypharmacy are important challenges. Stopping medicines and 'deprescribing' is an area of current interest. It is proposed the standards review team consider 'deprescribing' as an area for inclusion in the review of RPS hospital pharmacy standards. Include RPS prescribing competency framework ¹⁴⁶ under standard 5 ('Medicines expertise').	

Recent references build on the evidence base for pharmacist prescribing:

Service evaluations have identified benefits of pharmacist independent prescribing including reduction in prescribing errors, medicines optimisation, reduced admissions/readmissions and referrals, pharmaceutical care issues being resolved more quickly, reduced length of hospital stay and delays to discharge and freeing up of medical time ¹⁴⁹ .	Level 3
Service re-design is important to encourage increased uptake of pharmacist prescribing. A structured Delphi survey method was used to develop consensus guidance to facilitate service redesign around hospital pharmacist prescribing ¹⁵⁰ .	Level 4
The opportunities and challenges for pharmacist prescribing have been reported ¹⁵¹ .	Level 4
A small observational study at 3 hospitals in Northumberland Healthcare NHS Foundation Trust looked at prevalence of pharmacist prescribing and prevalence of prescribing errors by pharmacists. It suggests that prescribing pharmacist can provide a valuable role in safely prescribing for a broad range of patients in general hospitals and this role includes supporting patient admissions. Further larger controlled studies are recommended to validate the results ¹⁵² .	Level 3
Pharmacy innovation at discharge and a study at Lancashire Teaching Hospital on the impact of pharmacist non-medical prescribing on quality and streamlining processes, captures the benefits of using feedback from patients and stakeholders to inform service review processes. It also found clear benefits from introducing independent prescribers to the discharge process ¹⁵³ .	Level 3

3.6.5 Intensive care unit

Studies that pre-date this review describe the role of the critical care pharmacist. Recent references build on the evidence base for the specialist critical care pharmacist.

An observational study at 3 participating hospitals with critical care units supports the international evidence of the positive impact of critical care pharmacists. This was a pre-post controlled study carried out in 2 phases with 2 CCUs acting as the controls and an active site with a specialist pharmacist that carried out additional activities in phase 2 leading to greater numbers of pharmacist interventions ¹⁵⁴ .	Level 2-
A survey reports on a UK survey of pharmacist prescribing in neonatal units and initial experiences at the Southern General Hospital, Glasgow ¹⁵⁵ .	Level 3
A randomised trial in Belgium with 600 participants found a reduction in drug-related problems at the transfer point from intensive care unit to ward. Participants' medication was reviewed by a clinical pharmacist and the intervention group had an immediate communication of drug therapy recommendations (the control group changes were kept blinded) ¹⁵⁶ .	Level 1-
A retrospective evaluation looked at the proactive medicines-related interventions made by clinical pharmacists on critical care units within the same hospital. It found that critical care pharmacists make a significant number of proactive medication recommendations, with a high acceptance rate (90%) by medical staff ¹⁵⁷ .	Level 3
Further reviews describe the contribution of the pharmacist in the intensive care unit ¹⁵⁸⁻¹⁶¹ .	Level 4
Keypoint (for standards review): The standards review team should consider a modification of the RPS standards to mention the pharmacy team's important role in intensive care units and to signpost to UK core standards for ICUs.	

In 2013, the first edition of UK national standards for practice in intensive care units was published. Pharmacy is included (with standards on staffing levels, hours of service, competency of staff and attendance at multidisciplinary ward rounds)¹⁶².

It is also noted that the pharmacist's role is described across a broad range of medical and surgical specialisms¹⁶³⁻¹⁶⁸.

3.6.6 Pharmacy technicians and pharmacy assistants

The literature review includes pharmacists, pharmacy technicians and pharmacy assistants and the search strategy aims to be orientated towards clinical roles. The references described include studies on pharmacy technicians' roles in clinical areas including:

- Medicines reconciliation and taking medication histories^{169,170}
- Assisting in emergency care^{118,119}.

Recent references build on the evidence base for the clinical role of pharmacy technicians:

A literature review reports on the role and impact of hospital pharmacy technicians. The articles found after 1996 are less orientated on the verification between technicians (tech-check-tech) and more on support to pharmacist clinical roles ¹⁷¹ .	Level 3
A recent report on the roles of pharmacy technicians in the UK, from the University of East Anglia in collaboration with the Association of Pharmacy Technicians UK, included descriptive data from a survey and focus group. It collates data on the different activities undertaken by pharmacy technicians and shows that many of them have been carrying out clinical tasks, including patient facing tasks such as counselling ¹⁷² .	Level 3
In Australia, the Society for Hospital Pharmacists of Australia (SHPA) are undertaking a project on 'Pharmacy Technician and Assistant Role Redesign within Australian Hospitals	Level 4

(Redesign)'. A paper describes their findings and suggests that the United Kingdom exemplifies some of the more advanced roles technicians are capable of undertaking ¹⁷³ .	
In Australia a national survey of clinical pharmacy services for subacute aged-care inpatients identified the infrequent involvement of pharmacy technicians in the medication management and proposed expanding their role to support the provision of clinical pharmacy services ¹⁷⁴ .	Level 3
Keypoint (for standards review): This review and update to the standards is relevant to all the pharmacy team. The literature review also describes pharmacy technicians taking on extended clinical roles. Suitable terminology will be needed for any updates to the standards ie, "pharmacy team", "pharmacist", "pharmacy technician", wherever appropriate.	

The American Society of Health-System Pharmacy has published a statement that pharmacy technicians can take on important supportive roles in pharmacy informatics¹⁷⁵.

Pharmacy technicians development for leadership roles is described with new technician leadership roles at the John Hopkins Hospital (USA)¹⁷⁶ (Level 4).

There is interest in expanding the role of hospital pharmacy technicians beyond the services typically provided by pharmacy, with pilot research on pharmacy technician intergration into the ward team and a role that includes administering medicines (Level 4 – to mainly inform any further research). Further research is needed to understand the impact¹⁷⁷.

In Canada the role of the Clinical Pharmacy Support Assistant is described in a prospective pilot study conducted over 3 months looking at support for inpatient warfarin dosing (Level 3)¹⁷⁸.

It is possible for pharmacy assistants (unregistered pharmacy staff) to be involved in checking medicines brought in with the patient, within an agreed protocol¹⁷⁹.

3.6.7 Mental health

The pharmacy team's role in mental healthcare is established (references that pre-date this review).

A study on the evidence supporting pharmacist involvement in inpatient mental health services found that pharmacists provide a variety of services and play a significant role in inpatient mental healthcare. However the level of evidence supporting these services is limited and the type of outcomes achieved is narrow ¹⁸⁰ .	Level 1-
A narrative review looked at new roles for pharmacists in community mental health care ¹⁸¹ . A more recent study adds to the evidence-base by looking at the longer term benefits of employing a mental health pharmacist to work with child and adolescent mental health services ¹⁸² .	Level 3
'Treat as one', a report on mental health in general hospitals, takes a critical look at the divide between mental and physical health. To bridge the gap and improve the provision of mental healthcare will require good integrated care ¹⁸³ . Pharmacy's contribution to public health is already well-documented ^{184,185} , with areas such as alcohol misuse, smoking cessation and weight management being of importance in mental health pharmacy.	-
In Australia there are standards of practice for mental health pharmacy ¹⁰² .	-

3.6.8 Learning disability

The 'grey literature' search identified learning disabilities as a priority area for healthcare. A serious case review (the 'Winterbourne View' review) reported on problems at a private residential hospital, and criticised staff that lacked empathy and had judgemental attitudes towards persons with learning disabilities¹⁸⁶. Healthcare Inspectorate Wales²⁶ and Healthcare Improvement Scotland²⁷ have also identified learning disability as a priority area.

A narrative review describes that the pharmaceutical care in people with learning disabilities has limited evidence but pharmacists can have a positive effect¹⁸⁷ (Level 3).

3.6.9 Palliative and hospice care

The American Society of Health-System Pharmacy has published guidelines on the pharmacist's role in palliative and hospice care¹⁸⁸.

3.7 Seven day pharmacy services

<p>The 'grey literature' search results show the move across all 3 countries (England, Scotland, Wales) towards 24/7 pharmacy service provision^{56,57,189,74}. In Scotland there is currently a review of healthcare services on public holidays¹⁹⁰. In 2014 the RPS launched a report on seven days service in hospital pharmacy, including case studies and details on local approaches to seven day pharmacy services¹⁹¹.</p> <p>A review noted that the acute medical unit should have 7-day support from pharmacy. This will ensure the immediate availability of medicines for discharge and medicines reconciliation for patients with polypharmacy¹⁹².</p>	Level 4
<p>Keypoint (for standards review): The RPS professional standards, standards 5 and 7 already provide for seven day services however this should be emphasised throughout the standards and 'where necessary' removed.</p>	

An NHS England report on seven day services⁵⁷ also notes that a pilot at East Lancashire NHS Trust to re-engineer discharge services and improve communication at discharge¹⁹³ will become funded seven days a week at a larger scale, improving patient flow, safety and experience

3.8 Integrated care

Reports that pre-date this review already provide good evidence on the benefits of complex interventions involving collaborative medical care and pharmacy – especially in the UK, USA and Canada. The 'grey literature' search results show the move across all 3 countries (England, Scotland, Wales) towards integrated care^{56,65,74}.

<p>Randomised controlled trials that have provided evidence on the impact of pharmacist-led medication review on hospital readmission in different populations¹⁹⁴.</p>	Level 1+
<p>A more recent uncontrolled study looked at the benefits in an Irish hospital when a standard ward pharmacy service was compared with a collaborative model including a pharmacist in the ward based team. The uncontrolled before-after study included 233 patients. Pharmaceutical care involving medication reconciliation and review, delivered by clinical pharmacists and physicians, at admission, during inpatient care and at discharge was protective against potentially severe medication errors in acute medical patients and improved the quality of prescribing in older patients¹⁹⁵.</p>	Level 3
<p>From a 'grey literature' search NICE guidelines on medicines optimisation¹⁴¹ has accompanying resources that describe new roles for clinical pharmacists, including the integrated care pharmacist, for example the Integrated Care Clinical Pharmacist for Frail Older People¹⁹⁶ and an integrated care clinical pharmacist GSTT@home service¹⁹⁷.</p>	Level 3

The IMPACT project at Leeds Teaching Hospitals NHS Trust describes a service evaluation of 33 patient re-admissions found a reduced-readmission rate for patients who had received the enhanced assessment of patient needs. The project found improved medicines support and optimisation for older patients. There was improved communication and teamwork across the interface between secondary and primary care. It was not designed or powered to be a research project ¹⁹⁸ .	Level 3
Keypoint (for standards review): Integrated care is a 'system-wide' requirement. Any updates to the standards will need to reflect that pharmacy services are delivered collaboratively in a lot of settings across the healthcare system.	

An editorial on integrated care confirmed the Canadian standards contain many relevant statements to support integrated care. The UK standards reflect similar aspirations ¹⁹⁹.

As part of this literature review, we made a comparison between the European⁷⁹ and UK standards¹⁴ and confirmed that both sets of standards include relevant statements to support collaboration and integrated care.

NHS England recently launched the integrated primary and acute care system (PACS) framework to increase integration of health and care services and improve the lives of care home residents. PACS offers the potential to transform the entire hospital business model, across inpatient, outpatient, medical and surgical pathways²⁰⁰.

3.9 Transfer of care

The Scottish and Welsh Governments have identified delayed discharge/delayed transfer of care as priorities^{68,201}. NHS Providers' 'right place, right time' commission has a 'call to action' for better transfers of care²⁰².

The pharmacist and pharmacy technician roles in the transfer of care and medicines reconciliation is well-documented, with many references that pre-date this review. This review is focused on innovation and new developments. A number of areas were identified:

- Technology supported transitions of care to improve medication use, including electronic transfer of care to pharmacy via e-referral system
- Pharmacy technician-led medicines reconciliation
- Non-medical prescribing at discharge (More details are available in the 'Pharmacist prescribers' section – 3.6.4)

Technology supported transitions of care can improve medication use. There have been initiatives relating to electronic transfer of care to pharmacy via e-referral systems such as PharmOutcomes and Refer to pharmacy, which are based on the RPS e-referral toolkit²⁰³.

East Lancashire Hospitals NHS Trust are close to publishing a qualitative study about the introduction of Refer-to-Pharmacy, an e-referral system, and to evaluate the trend in readmissions reduction ¹⁹³ .	-
A service evaluation of an electronic patient referral system from one UK hospital Trust to community pharmacies across the North East of England shows an electronic solution (PharmOutcomes) can facilitate the transfer of information between hospital and community pharmacy teams to improve the coordination of care as patients transfer between care settings. A well-structured clinical trial of this intervention is required to investigate the impact on patients ²⁰⁴ .	Level 3
In Wales the discharge medication review service has been evaluated, and highlighted communication issues. A new service is being piloted that includes electronic referral tools to improve communications ^{205,206} .	Level 3
Service evaluation pilots in Scotland have demonstrated the benefit of electronically sharing, between hospital and community pharmacies, information about patient's medications at	Level 3

both admission and discharge. (NHS Highland – Access to Hospital Discharge Letters; NHS Tayside – Shared Clinical Portal) ²⁰⁷ .	
There is similar experience in the USA on technology-supported transitions of care to improve medication use ²⁰⁸ .	Level 3

References on pharmacy technician-led medication reconciliation show this is a role undertaken effectively by technicians ^{169,170} .	Level 3
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Recent references builds on the evidence base for pharmacy-led medication reconciliation programmes

A systematic review of pharmacy-led medication reconciliation programmes at hospital transition included 19 studies, including 11 studies which were randomised controlled trials. Overall, pharmacy-led medication reconciliation intervention tended towards reduction in medication discrepancies, compared with usual care, data on effectiveness on patients' clinical outcomes appear inconclusive ²⁰⁹ .	Level 1-
A study to determine current medicines reconciliation practice in four acute hospitals in one region of the UK and compare it with best practices found higher rates of unintended discrepancies per patient than in previous studies and a lack of adherence to current UK guidance on medicines reconciliation ²¹⁰ .	Level 3
A randomised controlled trial at a private hospital in Australia found no significant difference between the intervention group of older patients who received discharge medication review and the control group. Study limitations included that it was at one hospital and involved one clinical pharmacist, so limiting generalisability ²¹¹ .	Level 1-
A systematic review describes that pharmacist intervention during and after hospitalisation has been frequently studied and shows a variable effect on outcomes ²¹² .	Level 1+
A prospective observational cohort study at a University hospital in USA found that the pharmacy transitions programme had no impact on the 30-day readmission rate (primary outcome measure) but there was a positive impact on patient satisfaction ²¹³ .	Level 2-

In Scotland there are standards for the care of older people in hospital²¹⁴. The standards have been developed in recognition of the integration of health and social care services and note that effective discharge planning is a continual process and starts as soon after admission as possible.

Additional studies showed an increase in patient satisfaction when patients received pharmacy-initiated transfer of care services (More details are available in the 'Patient experience' section – 3.16).

In America a role of the transitions pharmacist extender has been introduced, in which hospital pharmacists visit patients in their home post discharge²¹⁵.

3.10 Specialist pharmacy services

Specialist pharmacy services (including quality assurance, medicines procurement, medicines information and medicines use and safety) have made a long-standing contribution to the NHS. The role of medicines information and quality assurance/ quality control and procurement specialists are not new but have expanded. Specialist pharmacy services include horizon scanning, evaluation of medicines, an injectable medicines guide, custom-made medicines and medicines assurance (with a closer alignment of specialists in pharmaceutical quality assurance and procurement). The literature review identified recent evaluations of their benefits:

An NHS England review of specialist pharmacy services in 2014 ²¹⁶ (from the 'grey literature' search).	Level 4
Recent primary research builds on the evidence base that shows the value of medicines information services ²¹⁷ , including an evaluation of the provision of patient medication helplines ²¹⁸ .	Level 3
Keypoint (for standards review): The supply of quality, safe and effective medicines is fundamental to pharmaceutical care. In the context of clinical pharmacy and medicines optimisation specialist pharmacy services are an important resource. The move towards 'clinical pharmacy' and patient focused care must be underpinned by assurance of the quality, safety and efficacy of medicines supplied.	

UKMi continues to lead work on the implementation and evaluation of patient helplines A national standard for patient helplines was introduced in 2014²¹⁹.

Specialist Pharmacy Services in England will work with four recently established Regional Medicines Optimisation Committees ⁵⁵ . An aim of the committees is to prevent duplication of work (see section – 3.2).	-
Keypoint (for standards review): The RPS standard 4.1 (Medicines policy) already refers to 'local, regional and/or national commissioning/purchasing arrangements'. The standards team should consider if this is sufficient. The context of Regional Medicines Optimisation Committees (England) will be noted in an update to the Handbook for Hospital Pharmacy Standards ⁵ .	

A new role is the Medication Safety Officer.

A role applicable to pharmacists, the Medication Safety Officer, was created in 2014 and a network established ²²⁰ . A similar initiative exists in Wales ²²¹ .	-
In USA there is a similar leadership role, "the medication safety leader". The American Society of Health-System Pharmacy has described "the medication safety leader" as essential for hospitals and health systems ²²² .	Level 4
Keypoint (for standards review): It is proposed the role of a medication safety leader ('Medication Safety Officer' or equivalent) is included under standard 9.1 on systems governance to expand on the sentence on "governance arrangements" by adding a requirement to report any concerns about medication safety to the medication safety leader (an identifiable lead person for medication safety)*.	

*Networks for sharing intelligence, eg, local intelligence networks for controlled drugs, 'Medication Safety Officer Network', are already covered by the existing standards under 6.2 (Safety culture) requirement to share within "professional networks".

The emphasis on clinical pharmacy practice has created a concern that there will be a dearth of practitioners specialising in pharmacy operations. A USA commentary suggests a solution is to create a new type of pharmacist and a new career path – the 'medication use systems and technology pharmacist' ²²³ . Some of the areas described are similar to the Specialist Pharmacy Services (England) review ²¹⁶ , including that the distribution of safe, effective and quality medicines is a cornerstone of optimal pharmacy practice models. A new role could include leadership in continuous quality-improvement efforts focused on medication-use systems and processes.	Level 4
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Keypoint (for standards review): It is recommended that the standards review team retain the wording in standard 7 ('supply of medicines') that reflects that the supply of medicines is efficient and designed around patients. The wording could be expanded to add "supply is undertaken as part of a system that includes continuous quality-improvement efforts with leadership provided by pharmacist and pharmacy technician practitioners specialising in pharmacy operations".

3.11 Custom-made medicines

The 2014 Hospital Pharmacy Standards include standard 4.3 for any medicines that are custom-made. 'Use of compounded, extemporaneously prepared, aseptically prepared, repacked and over-labelled medicines is consistent with the principles of risk reduction and using licensed medicines wherever possible'. This aligns with more recent RPS standards and guidance - Quality assurance of aseptic preparation services²²⁴, Guidance for the prescribers of specials²²⁵, Guidance for the procurement and supply of specials²²⁶.

Keypoint (for standards review): Include RPS standards and guidance references^{224,225,226} under standard 4.3.

3.12 Developments in digital technology and informatics

Harnessing technology and innovation forms a major part of NHS work programmes. The Wachter Review looked at harnessing the power of health information technology to improve care in England²²⁷. Strategy documents for Scotland^{228,229} and Wales²³⁰ also reflect the pace of change in digital technology and informatics.

<p>In 2015, NHS England conducted a survey, the "Digital Maturity Assessment", with respect to the implementation of ePrescribing systems in acute and mental health NHS settings "While the NHS leads the world in the use of IT in primary care, the adoption of information technology in the acute, community and mental health sectors lags behind"²³¹. NHS England has a global digital exemplar programme as a key component of driving digital maturity. 12 NHS acute trusts with high digital maturity scores will inspire others by exemplifying world-class use of digital technology both within and outside of organisation boundaries to improve patient outcomes²³².</p>	<p>Level 4</p>
<p>A Digital Medicines Portfolio provides for a number of digital medicine initiatives that will be key to the Hospital Pharmacy Transformation Plans in England⁵⁰. This includes integrating pharmacy across care settings.</p>	<p>Level 4</p>
<p>Keypoint (for standards review): Across all 3 countries (England, Scotland, Wales) there is a call for a more integrated approach to patient care with improved care transitions that require good data transfer and a more holistic approach to patient care.</p>	

<p>The Wachter Review²²⁷ describes clinician informaticists, 'chief clinical informatics officers' (CCIOs), a leadership role to improve data sharing and patient care. The role, working as part of a multidisciplinary team, provides opportunities for clinicians who have IT expertise, including pharmacists.</p>	<p>Level 4</p>
<p>Supported by the Scottish Government's ehealth strategy there is an eprescribing and medicines administration system prescribing implementation guide. 3 essential elements are identified – governance and risk management; leadership and organisational change; technology²³³.</p>	
<p>A standard for Information and Communication Technology is included in European standards⁷⁹.</p>	

Keypoint (for standards review): The current RPS professional standards do not include a standard on digital technology and informatics. It is proposed the standards review team considers introducing a standard in this area to reflect the pace of change and the role of pharmacist clinician leaders in IT.

Digitalisation needs to be prepared for a delegated Act to implement (by Feb 2019) the Falsified Medicines Directive (2001/62/EU). Manufacturers will include a 2D barcode and anti-tampering device on the packaging to uniquely identify each medicinal product ⁴² .	-
The importance of product traceability is included in European standards ⁷⁹ .	Level 4
Keypoint (for standards review): The current RPS hospital standards do not include 'product traceability'. The standards review team should consider a modification of the RPS standards to mention that pharmacy should support and implement systems that allow traceability of medicines	

The use of technology and informatics is on the rise. Primary research from America shows the results of the 2013 ASHP national survey on informatics²³⁴.

A US paper describes that a key position that helps to connect the pharmacy to the organisation's information system is the "Informatics pharmacist"²³⁵. The US extensive experience with IT and the role of clinician-leaders in IT is also described in the Wachter review²²⁷.

Following the Carter report⁴⁹ and plans for the Hospital Pharmacy Transformation Programme⁵⁰ there is increased focus on digital informatics, include the monitoring of new targets and benchmarks, e-prescribing, digital maturity and standardisation of coding systems (Scan4safety²³⁶describes early adopters of standardised bar code systems).

e-Prescribing is not a new area but developments include toolkits and case-studies that describe the implementation of e-prescribing systems^{237,238}. There has been a template job description published for the role of the advanced prescribing pharmacist (electronic prescribing)²³⁹.

Digital innovations in pharmacy and medicines optimisation include telepharmacy.

An area of innovation is remote pharmacy interventions and the use of telemedicine in pharmacy ²⁴⁰⁻²⁴⁴ .	Level 3
There are reports on barcode technology being used successfully in an Australian hospital for capturing pharmacy activities ^{245,246}	Level 3

The use of health apps in clinical practice to aid decision-making is increasing. Apps can help to diagnose and monitor patients. Examples include an NHS app to support the safe prescribing, monitoring and administration of lithium patients²⁴⁷.The MHRA has produced guidance on the regulation of medical apps²⁴⁸.

In Scotland, good practice case studies around eHealth, include PharmacyView, an IT solution that allows clinical pharmacists to visibly record those patients in most need of pharmaceutical care, in real-time¹⁰⁷.

In Wales, the digital strategy aims to transform services and there are an increased range of services available via the Welsh Clinical Portal, including discharge summary reviews²³⁰.See also technology supported transitions of care in section - 3.9 ('Transfer of care').

In 'personalised medicine' we can expect to see an increased demand for fully integrated informatics. The Wachter review notes the enthusiasm for 'big data' to provided a personalised approach is "more promise than reality" and will need changes throughout the system²²⁷.

3.13 Hospital emergency preparedness

The role of the pharmacist in emergency planning is included in ASHP standards⁸⁹. This is in conjunction with the hospitalwide emergency plan for providing safe and effective pharmacy services in the event of an emergency.

A case report describes one USA hospital's plans in which hospital pharmacists were trained (in 2007) to provide immunizations, as part of a multidisciplinary team, in the event of an emergency ²⁴⁹ .	Level 3
USA literature describes how the hospital pharmacist has a leadership role in ensuring the up-take of immunisation ²⁵⁰ .	Level 4
USA literature provides a practical guide for pharmacy leaders on hospital emergency preparedness planning ²⁵¹ .	Level 4
Keypoint (for standards review): Pharmacy's role in hospital emergency preparedness planning is not new but the search results reflect heightened concerns eg, epidemics and bioterrorism. It is recommended that the standards review team consider if hospital emergency preparedness planning should be added to the RPS standards.	

3.14 Evidence of effectiveness and value

Hospital pharmacy's contribution towards research and audit is included in the existing RPS hospital pharmacy standards (standard 8.4). International standards provide expanded information on the pharmacist's contribution towards research into the optimal use of medicines and the practice of clinical pharmacy^{33,89,98}.

The importance of demonstrating the effectiveness and value of hospital pharmacy practice is highlighted in references:

A systematic review (which did not include any RCTs) addresses the involvement and attitudes of pharmacists in pharmacy practice research and identifies that pharmacists recognise the value and that their actual involvement has increased over time ²⁵² .	Level 3
A report further explores the opportunities for pharmacy practice ²⁵³ .	Level 4
The RPS 'New medicines, Better medicines, Better use of medicines' report also describes new partnerships in relation to practice research (academic-practice) and in medicines research (academic-industry-practice) ¹²⁶ .	Level 4
Keypoint (for standards review): It is proposed the standards review team consider a modification of the RPS standards to mention the importance of research and the opportunities for closer alignment between hospital pharmacy, academia and other partners.	

3.15 New medicine technology

This review does not focus on the clinical use or handling of specific medicines but it is noted that changes to the 'medicines landscape' and new medicine technologies impact significantly on hospital pharmacy practice. The role of the hospital pharmacy team in clinical research is not new and multidisciplinary collaboration and networks such as the National Institute for Health Research are important elements to consider.

The RPS' new medicines report¹²⁶ describes new areas such as 'biologicals' (including 'biosimilars', monoclonal antibodies and vaccines), advanced therapy medicinal products (including gene therapy, cell therapy, tissue-engineered products) and personalised medicine. New medical technologies include medical devices containing medicines, digital developments (eg, 'smart packaging' and electronic leaflets, wearable technology, smart devices eg, inhalers to monitor response and/or provide alerts).

New opportunities are emerging with 'personalised medicine' and novel approaches, such as whole genome sequencing, data and informatics and wearable technology. Genetic markers and prescribing are already a reality, especially in oncology eg, imatinib, cetuximab and this is a growing area with advances in genetic medicine^{126,254}. Personalised medicine ('precision medicine') is the opposite of the traditional 'one size fits all' approach. Personalised medicines are tailored towards a patient's genetics and response so that an individual can receive an appropriate medicine for them.

Biosimilar medicines are defined as "a biological medicine that is designed to be similar to an existing biological medicine (the 'reference medicine')". There are many reports on biosimilars, including a national prescribing framework to support their safe and effective use in Scotland²⁵⁵. The British Oncology Pharmacy Association (BOPA) has described the role of pharmacy in the implementation of monoclonal antibodies²⁵⁶. There is a cancer vanguard biosimilars project which is pioneering novel partnerships to make better use of medicines²⁵⁷.

New agents are expensive and have specialised requirements for storage, handling and transport. 'Biologicals' are often complex structures requiring refrigeration. Pharmacy has a role advising on complex prescribing decisions such as value and interchangeability and in educating patients and healthcare professionals. There is less long-term safety data for newer agents so pharmacovigilance and adverse event reporting are particularly important. Pharmacists will take the lead in the introduction of biosimilars eg, a clinical oncology pharmacist working alongside specialists²⁵⁶.

Keypoint (for standards review): The current RPS hospital standards do not include a specific standard on the introduction of these new medicines. Due to the complexities of new medicine technologies it is suggested that the standards review team consider adding a specific standard on this area. Proposed wording (for consideration) –

The pharmacy team provide leadership and education on the introduction and use of complex new therapies, in collaboration with the multidisciplinary team. The provision of new therapies may require service innovation and the establishment of new partnerships, designed around the needs of patients and not organisational structure.

The hospital pharmacy team has a role in clinical research¹²⁶. The role of the pharmacist in clinical trials is included in the EAHP standards³³.

Keypoint (for the standards review). It is proposed the standards review team consider modifying standard 4.1 (medicines policy) or 8.1 (professional leadership) or 8.4 (clinical leadership) to mention the pharmacy team's important role in clinical trials.

Keypoint (for the standards review). It is essential, as treatments such as advanced therapy medicinal products develop, that the pharmacy profession is aware of the requirements for handling and preparation and that appropriate facilities are available. "Quality Assurance of Aseptic Preparation Services: Standards Handbook"²²⁴ describes that in many cases purpose designed facilities will be needed. Due to the very

specialist nature of these products it is very unlikely that a pharmacy facility will be taking on the full control of all aspects of the preparation process, and many other specialist professionals will be involved. Such innovations require pharmacy to develop and form new partnerships. (See the 'Evidence of effectiveness and value' section – 3.14).

3.16 Patient experience and patient safety

Recent references build on the evidence base on how pharmacy teams can measure and improve patient's experience of care.

The literature review identified measures of patient satisfaction in hospital patients can be improved by clinical pharmacy services ^{258,259,260} .	Level 3
Face-to-face semi-structured interviews with 74 inpatients admitted to acute medical wards of 3 NHS general hospitals indicate a dichotomy of expectations and opinions for patients about the engagement of hospital pharmacy and pharmacy services in their care ²⁶¹ .	Level 3
In 2015 the RPS held a one-day summit on how pharmacy teams can measure and improve patients' experience of care ²⁶² .	Level 4
Keypoint (for standards review): Patient experience was addressed in the update to RPS standards in 2014. Recent references will be included in an update to the Handbook for Hospital Pharmacy Standards ⁵ .	

A NICE quality standards on patient experience defines best practice and provides quality measures for adult patients receiving NHS services²⁶³.

The Institute for Healthcare Improvement and Picker Institute Europe has been working with NHS England to develop and "Always Events" Programme. Pilots include the Blackpool Teaching Hospitals NHS Foundation Trust who have developed an Always Event to help stroke patients and carers with medication on discharge, pharmacists were involved with the pilot's design and implementation. An evaluation provides preliminary evidence (level 3) as most of the trusts involved in the programme were still at the initial stages of implementation²⁶⁴.

Patient safety in England is now part of NHS Improvement. NHS England's Never Events Policy and Framework and Never Events list was revised in March 2015. This forms part of the commitment to open and transparent patient safety incident reporting²⁶⁵.

A review on medication safety strategies in hospitals describes the effective strategy of pharmacist-involvement in medication safety²⁶⁶ (level 2-).

3.17 Patient and carer access to information and support about medicines

The current RPS hospital standard 1.2 (Information about medicines) includes to "provide patients with information about medicines and their unwanted effects, in a form that they can understand". NHS standards on accessible information were recently introduced. NHS England's Accessible Information Standard ('SCCI1605 Accessible Information') is a new 'information standard' for implementation from 1 Aug 2016 by all organisations that provide NHS or adult social care²⁶⁷. There is an All Wales Standard²⁶⁸ and developments on accessible information in Scotland²⁶⁹.

Keypoint (for standards review): It is proposed the standards under review are modified with the existing statement expanded to show the importance of 'accessible information'. The proposed additional wording is - "in a form that they can access and understand".

3.18 Workforce development

In 2013 the RPS Faculty was launched. The RPS Faculty and Foundation programmes provide practitioners working in any sector of the pharmacy profession with developmental tools and frameworks, and a professional recognition process. Standard 10.2 (workforce development) of the RPS hospital standards already states " All members of the pharmacy team are aware of their own level of competency and see how they can develop in their roles and careers, for example through RPS Faculty and foundation support, where appropriate."

There are similar statements in other standards, including EAHF standards⁷⁹ "Hospital pharmacists should participate in the development of European wide competency frameworks to ensure best standards of practice are met". The USA minimum standards for hospital pharmacy practice⁸⁹ describe "The pharmacy director shall ensure that an ongoing competency assessment program is in place for all staff, and each staff member should have a continuous professional development plan". In Australia, the SHPA clinical pharmacy standards⁹⁸ describe use of clinical competency frameworks, such as shpaclinCAT, and the importance of review of clinical practice by a peer. There is also a national competency standards framework for pharmacists²⁷⁰. The detailed chapters that form the standards for hospital pharmacy practice cross refer to the relevant competencies and accreditation frameworks.

Keypoint (for standards review): It is recommended that the standards review team strengthen standard 10.2 to reflect that the RPS developmental programmes provide more than the practitioner's "awareness of competency" as the wider benefits are increasingly recommended by employers with links being made between the RPS frameworks to career structures and posts, including consultant pharmacist posts^{271,272}. The need for review of clinical practice by a peer (for example, reflective practice/clinical supervision involving peer feedback) is an additional point to consider for inclusion (including that this is a 2-way process).

4. Conclusion

A comparison of the existing RPS hospital pharmacy standards with those published by the European Association of Hospital Pharmacists identified some differences. These are described in the review with pharmacy practice research, clinical trials, information technology and product traceability highlighted as areas for further consideration by the standards review team.

The review was also looking for examples of new roles and service innovation. The evidence base is increasing on the role of the pharmacy team within the emergency department, intensive care unit, antimicrobial stewardship, medicines optimisation, pharmaceutical care and health informatics. The landscape for service delivery is changing with digitalisation and informatics. The development of digitalisation in secondary care is not as advanced as in primary care but evidence from exemplar sites will build on the evidence base.

Many reports from the literature review show a shift towards increased clinical pharmacy activities over the traditional role of supply/dispensing and this will need to be reflected in the standards update. The numbers of pharmacist prescribers are increasing and work is described to benchmark activity and ensure their potential is fully realised.

This review and update to the standards is relevant to all the pharmacy team. The review also describes pharmacy technicians taking on extended clinical roles.

The review highlights the importance of specialist pharmacy services and practitioners that specialise in pharmacy operations. The supply of quality, safe and effective medicines remains fundamental to being able to provide pharmaceutical care.

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