

E HEALTH COMPETENCY FRAMEWORK

DEFINING THE ROLE OF
THE EXPERT CLINICIAN

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PREFACE

Clinical leadership and strong clinical engagement are well documented determinants of successful eHealth initiatives. Traditional clinical training does not always equip medical and dental practitioners with the knowledge and skills required to understand how eHealth can be used to improve outcomes for patients, clinicians or organisations or to work collaboratively as part of a multi-professional eHealth team.

This framework has been developed to define the knowledge, skills and behaviours that are required by practising clinicians who have a role in eHealth at a local, regional or national level. The framework covers a broad range of domains from generic competences required by all, such as the safe and secure management of health information, to areas of in depth informatics knowledge which may only be required by a limited number of individuals. It is hoped medical and dental practitioners can use the framework to demonstrate achievement of competences relevant for their roles within their own organisations at different stages of their professional careers.

The eHealth Competency Framework is a joint collaboration between the Academy of Medical Royal Colleges and The Scottish Government.

The Framework has been widely consulted upon during its evolution. I would like to thank everyone who has contributed to its development and my steering group colleagues for their help and support. It will be reviewed and updated by the Academy of Medical Royal Colleges in the future.

I would particularly like to thank The Scottish Government for their recognition of the need for this competency framework, for providing the funding to make it possible and for their advice and support during its development.

My thanks also goes to the Academy of Medical Royal Colleges for recognising that clinical leadership and engagement are essential in ensuring healthcare information and communication technologies can be used to support high quality clinical care.



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1. INTRODUCTION

eHealth describes the use of electronic communication and information technology to improve the access, efficiency, effectiveness and quality of clinical and business processes utilised by healthcare organisations, healthcare professionals and patients. This includes the collection, use and sharing of information to support the delivery of healthcare. This clinical field has developed rapidly over the last decade as advances in technology, and availability of information, have influenced changes in clinical service delivery.

Healthcare organisations across the world understand how eHealth can enable them to transform care processes and improve outcomes. In the current economic climate it is critical that eHealth resources are targeted at those areas which will deliver maximum benefits to patient care, improving safety and efficiency of service delivery. The importance of the role of clinicians in this process is now increasingly recognised.

Some healthcare organisations outside the UK have Chief Medical Information Officers, or Medical Directors of IT, who act as the link between clinical colleagues, Information Technology staff and senior management teams. These individuals play a key leadership role in their organisations, with involvement in strategic planning and service improvement, as well as acting in a clinical advisory capacity for the selection, development and implementation of clinical information systems.

Within the UK most healthcare organisations do not have clinical posts equivalent to those of Chief Medical Information Officers. However, there is increasing respect for clinical leadership and engagement in the development of eHealth strategy, and use of technology in the healthcare setting. A small number of medical and dental practitioners already work in the fields of health or clinical informatics and may have acquired academic qualifications relating to these subjects.

Most doctors and dentists who are asked to provide clinical leadership in eHealth within their organisations are unlikely to have undergone any formal training in informatics and will continue to work as practising clinicians in their own specialities. In the majority of cases the eHealth role is seen as a secondary area of specialist interest, or some clinicians may be provided with dedicated time to undertake this role as part of their job plan. In a small number of cases, such as those in regional or national leadership roles, eHealth will be the primary focus of work for the medical or dental practitioner.

This eHealth Competency Framework is primarily aimed at those in continuing clinical practice who also undertake eHealth roles whether at a local, regional or national level i.e. the “clinician informatician.” The framework covers the broad range of competences that may be required for the small number of clinical staff whose main area of work is eHealth. The majority of other clinician informaticians will not be required to have an in depth knowledge of all domains covered in the framework and it is anticipated that each clinician will be able to focus on those competences most relevant to their role within their own organisation.

There are a number of competences, such as those relating to safe and secure management of healthcare information, that are applicable to medical and dental professionals at all stages of their careers. Some of these generic competences may be included in both undergraduate and postgraduate curricula in the future. The framework also defines recognised competences that can be acquired by medical and dental trainees who wish to become immersed in the culture and ethos of eHealth. This is likely to be achieved by undertaking a one-to-two year out of programme experience with subsequent continuing interest in eHealth being undertaken alongside their own specialty.

Since the role of clinicians in eHealth is predominantly one of leadership some of the competences described in this framework align with other competency frameworks, such as the *Academy of Medical Royal Colleges* and the *NHS Institute for Innovation and Improvement: Medical Leadership Framework*. There are also a number of competency frameworks in existence relating to areas of eHealth, such as information governance, information use in healthcare and telehealthcare. Relevant competences from these existing frameworks have been included, in this document to avoid duplication of work already undertaken. It is recommended that these other competency frameworks, referenced in Annex A, are read in association with this document.

1.1 Assessment for eHealth Competency Framework

Acquisition of competences must be assured during any training programme. Trainees from all the disparate specialities will have experience of both formative and summative processes that are designed, and have been validated, to determine whether defined competences have been obtained. The most common workplace based assessments are designed for use within the clinical setting that the trainee is primarily working within and are unlikely therefore to be immediately transferable for use with the eHealth framework. Similarly summative assessments including the Medical Royal Colleges examinations are designed to test the competences defined within the relevant specialty curricula.

The framework has defined the competences that should be acquired during an e-health training period but it is not within the remit of this framework to design new assessment tools. It is suggested, however, that a two-pronged approach could be adopted to ensure adequate assessment of trainees' competence acquisition. Firstly, as with the medical leadership framework, certain of the existing workplace based assessments could be modified to facilitate review of competence acquisition in eHealth. For example, the acute care assessment tool has features that make it amenable to use for assessing leadership competences and assessments, such as case based discussion, could be similarly modified for use in e-health training.

Secondarily, centres using the framework, in collaboration with local educational centres may develop a formal summative assessment based on the competences defined within this framework. For the latter assessment this may be associated with the formal award of a diploma and thus may be the formal assessment of knowledge acquisition whereas the use of workplace based assessment would better assess the application of skills and the relevant attitudes.

Diagrammatic representation of the positioning of eHealth training



- 1 Represents specialties with core training coming prior to specialty training and shows a specific period of e-health training (probably as a one year period at any period during specialty training)
- 2 Represents specialties that have entry to specialty training straight from Foundation. Again ehealth training may be taken as a specific period of training within the specialty training years
- 3 Represents training in e health taking place concurrently with specialty training (probably about 2 years). This applies to training with or without core training periods

2. CLINICAL LEADERSHIP AND MANAGEMENT

The competences in this section describe the management and leadership skills required by doctors and dentists working in eHealth. They must develop self awareness, recognising their own values, principles and assumptions, be able to manage themselves and others, take account of the needs and priorities of others and always act with integrity.

Doctors and dentists showing effective leadership are focused on the success of the organisation in which they work, manage resources efficiently, motivate and provide direction to others and support activities that monitor and improve performance. They must play a leadership role in promoting use of technology that encourages improvement and innovation and facilitates transformation while continuing to ensure patient safety.

Clinicians contributing to eHealth at a local or national level need to be aware of the organisational, economic and political context. This requires an understanding of health service delivery, both local and national, and how eHealth initiatives support the strategic direction of travel and contribute towards improving business processes.

2.1 Clinical Leadership and Team working

Objective:

- *To acknowledge that effective leaders need to demonstrate personal skills and qualities which enable them to develop and motivate their team, influence others and communicate effectively ¹*

Knowledge
Understand how forming a common goal or vision for a team, department or organisation, will contribute to the overall aim and success of a project
Have awareness of different roles undertaken by people working in eHealth and the skills and attributes they should have
Understand the need to build networks with stakeholder groups and to build and maintain relationships with them and professional colleagues
Understand principles of effective communication and how to apply them in developing personal networks
Understand how to select and successfully apply different methods of encouraging, motivating and supporting people and recognising achievement
Understand the difference between management and leadership, the range of different leadership styles and how to apply these to different settings or people

Skills

Set clear goals and objectives and communicate these to other healthcare and IT professionals

Develop communication networks to ensure different clinical communities are aware of progress, changes and future plans in relation to eHealth initiatives

Gain and maintain the respect, trust and support of colleagues

Facilitate and gain consensus from a wide range of stakeholder groups

Use language that can be understood by stakeholder groups to avoid different or conflicting interpretation

Manage time efficiently and complete work within required deadlines

Employ strategies to manage conflict of interests and differences of opinion

Keep up to date with eHealth related issues relevant to delivery of future services

Collate and appraise developments in knowledge and practice and disseminate this information to a wider audience e.g. speaking at meetings/conferences, publishing articles and guidelines

Behaviours

Recognise and articulate your own values and principles, understanding how these may differ from those of other individuals or groups

Recognise and articulate others' values and principles, when representing them in project boards, steering groups and stakeholder forums

Recognise and respect the roles, responsibilities, interests and concerns of colleagues and stakeholders and manage these effectively

Adopt a team approach, acknowledging and appreciating efforts, contributions and compromises

Recognise your own communication and presentation style and when this needs to be adapted to influence the target audience

Take responsibility for exploring difficult issues and resolving conflicts

Recognise the need to be adaptable and respond to requests within short and long term timescales

Adopt a positive attitude to problem solving and decision making

Consider the resource implications of decisions and potential impact on other services

Lead by example to create a long term cultural shift with the use of eHealth

2.2 Managing Services and Performance

Objectives:

- *Recognise that information is required for healthcare planning, commissioning of services and allocation of resource*
- *Understand the need to critically appraise information provided and to ensure that data is accurate and up-to-date*
- *Recognise how IT systems should provide information to measure performance against local and national targets and the need for this information to be open and transparent*
- *Recognise that the process of healthcare can be analysed in the same way as any business process and that business intelligence and analytics can be used to help improve patient care*

Knowledge
Understand the importance of establishing and applying valid and appropriate measures for evaluating the performance of your organisation. Recognise the need for transparency and publication of this information for quality assurance ^{2 3 4}
Understand how information can be analysed from multiple databases and different sources to monitor performance
Understand how data can be measured, compared, grouped and triangulated and how best to present data for different purposes
Have awareness of tools available for generating performance reports. Understand the advantages and disadvantages of these reporting tools for generating regular or ad hoc clinical and management reports
Have awareness of performance reports required by national regulatory bodies, how information contained in these reports is captured and validated and any limitations that may apply
Be aware that data analysis can be retrospective, real time or prospective and can be used to help predict likely outcomes
Be aware of other methods of quality assurance and control used in healthcare organisations other than performance reports
Understand the difference between process measures and outcomes in performance measurement and monitoring
Understand that business intelligence refers to computer-based techniques used in identifying, extracting and analysing data, such as health outcomes, by clinician, department or cost
Understand how business intelligence can provide data to support clinician appraisal and revalidation

Skills

Establish systems to collect, evaluate and report on outcome data which indicate service effectiveness, efficiency, accessibility and acceptability.

Critically evaluate performance reports and challenge information presented, if appropriate

Work with staff developing extracts and reports so that the content is relevant and meaningful to clinicians

Use information to understand variation in existing practices and processes and take action when resources are not being used efficiently, effectively or ethically

Use information relating to individual or team performance as part of appraisal or revalidation process

Undertake activities to implement and promote quality assurance

Behaviours

Recognise the need to quality assure healthcare to identify areas of concern, deliver sustained improvement and facilitate transformation

Promote the use of electronic healthcare information systems to collect detailed information that can lead to new insights through intelligent analysis

Promote the use of performance metrics, such as key performance indicators, that measure processes of healthcare

2.3 Improving Services

Objectives:

- *Recognise that leaders in eHealth must be able to manage and improve services, facilitate change and transformation and support innovation*
- *Recognise how information technology and informatics can be used to support change and transformation, to benchmark performance and to promote a culture of excellence and achievement*
- *Aware of organisations responsible for quality assurance of healthcare*
- *Understand that improvements need to demonstrate clear benefits such as in areas of quality, productivity, efficiency and effectiveness*
- *Awareness of the difference between technology driving service change or facilitating needs led change*

Knowledge

Understand how informatics can enable changes in clinical and business processes that drive quality improvement in healthcare settings

Have awareness of improvement and change methodologies which can support service improvement and innovation

Understand the role of local clinical audit in promoting quality improvement

Awareness of local, regional and national data sources that can be used to create quality metrics

Understand how quality outcomes are developed, validated and benchmarked in practice

Understand what is meant by patient experience metrics and clinical outcomes

Dashboards can be constructed to allow for the visual representation of quality metrics

Understand the limitations of metrics, the difference between quantitative and qualitative data and the concept of dynamic quality

Have awareness of statistical issues around case-mix adjustment and comparisons through basic understanding of correlation, standardisation, confidence limits and process control techniques

Understand how to benchmark the performance of your unit or organisation against others and take actions based on findings

Have awareness of the organisations responsible for quality assuring clinical practice in your place of work^{5 6 7 8 9}

Be aware of ways of measuring the effect of improvements on productivity, efficiency, effectiveness and safety

Skills

Develop, record and use quality metrics to assess and improve care delivered

Use and interpret information contained in a clinical dashboard

Undertake clinical audit to identify where service improvements could be made

Identify healthcare improvements and develop creative and innovative solutions to transform services and care

Behaviours

Recognise how quality metrics or outcomes can drive healthcare improvement through continuous performance monitoring

Recognise how benchmarking can improve quality across healthcare settings and systems

Engage with identifying 'best practice' in IT enabled change elsewhere

Challenge organisational and professional cultures that are resistant to change

Engage with colleagues when involved with, or leading, change programmes

Behaviours

Promote a culture of high achievement and excellence, while ensuring patient dignity, satisfaction and safety

Promote eHealth to decision makers as an enabler for delivering improved quality of care

2.4 Healthcare planning and delivery

Objectives:

- *Develop an awareness of how healthcare is delivered, managed and governed in each UK administration and recognise the benefits and risks associated with each model*

Knowledge

Have awareness of the organisations responsible for developing healthcare policy in all four UK administrations ^{10 11 12 13}

Understand the differences in models of healthcare delivery and service provision and relationships between healthcare providers across the UK

Have awareness of NHS governance structures

Be aware of the management and governance arrangements for health and social care organisations

Be aware of financial drivers and constraints affecting healthcare planning and delivery

Understand the benefits and disadvantages of healthcare models outside the UK

Skills

Contribute to local or national healthcare policy and planning

Keep up to date with policies and emerging practice

Use lessons learned from both national and international experience to avoid repeating mistakes and as an opportunity to promote success

Behaviours

Recognise diversity of healthcare delivery, funding and governance arrangements across the four UK administrations

2.5 Setting direction

Objectives:

- *Understand the need for both local and national eHealth strategies and be aware of the teams responsible for their delivery and implementation*

- *Recognise tensions arising from centrally driven eHealth strategy at a local level and the impact on innovation and progress*
- *Understand the factors determining those elements of eHealth strategy that are best agreed at a national level and those that should be left to local discretion*

Knowledge

Be aware which organisations are responsible for developing and implementing national eHealth strategies and understand the similarities and differences between strategies across the UK ^{14 15 16}
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Have awareness of stakeholders influencing development, funding and governance of national eHealth strategy

Be aware of NHS national projects, initiatives and developments in the field of healthcare information technology

Be aware of eHealth strategies and developments in other international countries which may influence future UK strategies

Understand the critical elements of local and national eHealth strategies, in the domains of governance, competence, leadership and technology

Understand the success criteria for local and national eHealth strategies, in particular the interplay between technology, process, benefits realisation and clinical engagement

Understand the mechanisms for successful eHealth innovation to be adopted into regular, mainstream use in the delivery of care at local and national levels

Skills

Evaluate and recognise a successful local or national strategy, and the implications for working practices, governance, competence and leadership of the technological changes involved

Adopt innovation that has been successfully used or piloted elsewhere without trying to invent new solutions for the same problem

Behaviours

Contribute to the development of local or national eHealth strategy, articulating clinical priorities

Recognise the strengths and weaknesses of having different national eHealth strategies on information flow through the health service in the UK

Recognise tensions arising from centrally driven eHealth strategy at a local level and the impact on innovation and progress

Anticipate emerging trends that will influence future strategy

Encourage adoption of eHealth into the core delivery of care, prevention and public health



3. IT HEALTHCARE PROJECTS

Doctors and Dentists working in eHealth are required to communicate and work with colleagues from a range of professional backgrounds. They must demonstrate competence in building and maintaining relationships, developing networks, encouraging contributions from others and be able to work as part of a multi-professional team. This requires knowledge not only about how technology is procured but also about the design, implementation and maintenance of systems, and an understanding of how projects are managed.

3.1 Project Leadership

Objectives:

- *Recognise the importance of clinical input at all stages of an eHealth project from design, development, quality assurance, training, implementation and enhancement through to controlled withdrawal or re-procurement*
- *Understand methodologies used for project management, associated terminologies and vocabularies and factors linked to successful project completion*
- *Recognise the role of clinicians as members of a project team and the skills and knowledge required to participate in a project effectively*

Knowledge
Have awareness of the principles, processes, tools and techniques for managing healthcare projects, such as PRINCE2 ¹⁸ and Managing Successful Programmes ¹⁹
Have awareness of methodologies used for scrutinising healthcare change programmes, such as gateway reviews ²⁰
Understand the role and remit of different members of the project team e.g. project manager, project sponsor
Understand how and why a project board is established, its constituent members and the role clinicians may have on a project board, clinical reference or advisory group
Understand how to identify key stakeholders for a project or programme and the role stakeholders may have at different stages of a project
Have an understanding of project documentation required at different stages of a project lifecycle, e.g. project initiation document, project status report, risk log
Understand how to assess and manage risk
Understand the factors linked to successful completion or failure of healthcare IT projects and the evaluation processes involved
Be aware when to consider Privacy Impact Assessment ²¹ and Equality and Diversity Assessment ^{22 23 24 25}

Skills

Undertake project planning, implementation, monitoring or evaluation

Act as a member of a project board, clinical reference or clinical advisory group

Communicate clearly and effectively with all members of the project team and external stakeholders

Ensure programme or project goals remain aligned to clinical objectives, where appropriate

Determine project risks and identify solutions to mitigate against these

Identify when a project is not progressing to plan and recognise the clinical, organisational and financial benefits and risks associated with continuation or termination

Behaviours

Recognise that governance and accountability arrangements are required for effective project management and that effective contingency planning should be undertaken

Recognise the constraints and limitations of each project

Value contribution from others and recognise their areas of expertise

Recognise the need to identify and engage with key stakeholders to ensure project success

Have a clear sense of role, responsibilities and purpose within the team

Be willing to identify project risks and voice concerns about failing projects

Recognise changes in circumstances promptly and be willing to change your plans accordingly

3.2 Sourcing, developing and implementing healthcare information and communication technology systems and applications

Objectives:

- *Recognise how IT systems and applications are procured and the processes associated with this*
- *Recognise the need to specify requirements and identify potential benefits prior to developing or sourcing a system or application*
- *Understand the processes involved with developing, configuring, testing and implementing new products*

Knowledge
Understand sourcing options for IT products in the UK and the legal requirements relating to the procurement process ^{26 27}
Understand the need to specify requirements, methods of achieving this (e.g. stakeholder workshops) and the need for refinement, prioritisation and ongoing management of these requirements
Understand the need to identify anticipated, measurable benefits of implementing a new system or application
Understand the role of demonstrator projects to assess functionality, benefits and costs of systems or applications prior to decisions about procurement
Understand how to evaluate and assess tender and procurement responses to identify product that meets requirements and will provide good return on investment (ROI)
Have awareness of local and national teams involved with contract negotiation and management
Understand the processes involved with developing, building, testing, user training and implementing new systems and recognise where clinical engagement is vital to ensure successful adoption
Be aware of the benefits and risks of different project methodologies, such as agile and waterfall, when used for software development
Understand the technical processes required to develop, configure and test new products prior to implementation
Understand that implementation of new systems may require change to business processes or service redesign to maximise achievement of benefits
Understand the need for all healthcare staff to be IT literate and able to use all aspects of eHealth safely, effectively and efficiently ²⁸

Skills

Communicate information about clinical and business requirements to suppliers and developers clearly and effectively

Critically appraise costs relating to procurement, development and implementation of new systems and be able to identify return on investment

Identify and measure benefits of system implementation

Undertake procurement, development, configuration or user acceptance testing of new systems

Identify solutions that assure data privacy, patient and user confidentiality, security and integrity

Undertake assessment of the impact of implementing new systems on people and services and articulate the need for any changes required to business processes

Undertake a privacy impact assessment prior to implementation of any new system

Design implementation including scope of deployment, early adopter pilots and roll out

Identify barriers to successful implementation and solutions to overcome these

Manage expectations of clinical colleagues

Develop collaborative vendor-client relationship

Behaviours

Consider safety, usability and cost effectiveness when specifying requirements for clinical systems

Contribute to writing and development of a business case for a new clinical IT system or application

Balance clinical aspirations against the need to procure and implement an affordable solution in a timely manner

Encourage involvement of front line clinical staff with requirements definitions, system design, testing, training and realisation of benefits

Promote the need for good governance processes to ensure systems developed or procured are able to provide the functionality required to deliver the greatest benefits to the patient, end user and the organisation

Engage with colleagues to assess their readiness for implementation in terms of attitudes, computer literacy, hardware and infrastructure

Facilitate the introduction of new systems or processes and support clinical colleagues during periods of change

Promote development of systems that are safe and reliable and prevent harm from occurring

3.3 Maintenance and support of healthcare IT systems

Objectives:

- *Recognise the need for continuous monitoring of system safety and performance*
- *Understand procedures relating to identification and rectification of faults*
- *Understand procedures required for system patching or upgrades*
- *Understand what processes need to be put in place so that clinical care is not compromised if clinical IT systems are not available*

Knowledge

Understand the differences and trade-offs between the following qualities of a system:

- Scalability
- Resilience
- Maintainability
- Recoverability
- Zero data loss
- Performance
- Availability
- Flexibility
- Business Continuity

Have awareness of processes and methods to test and continuously evaluate the safety and efficacy of clinical systems

Understand notification processes for system or application problems and the role of different individuals and facilities, including problem managers and service desks

Be aware of the Information Technology Infrastructure Library (ITIL) framework and its benefits for IT service management ²⁹

Understand the need for Change Control procedures and how requests for system changes should be managed effectively

Understand application patching and upgrade processes and procedures, in particular those relating to system testing, system safety and business continuity arrangements

Understand the need for patching or upgrading of systems to maintain security in the face of changing threats, to protect patient information

Understand the need for data storage back up processes and disaster recovery procedures to ensure clinical care can continue to be delivered safely

Have awareness of processes to monitor system performance and capacity and how agreed standards are implemented, e.g. use of SLAs (Service Level Agreements) with suppliers

Understand how clinical requirements relating to business continuity and disaster recovery can be translated into service level language

Skills

Develop and implement processes and methods to test and continuously evaluate the safety and efficacy of clinical systems

Work with system developers and other healthcare IT professionals in areas of good practice that enhance patient safety

Undertake user acceptance testing of software prior to application upgrades

Communicate problems about clinical systems or applications clearly and concisely with technical staff and provide feedback to clinical colleagues where necessary

Maximise use of available IT assets

Behaviours

Question the safety and efficacy of clinical systems and be prepared to retire or reject those that have not been adequately evaluated

Promote a safety culture within the service or organisation

Promote application of continuous clinical and quality assurance processes

Highlight the importance of business continuity arrangements for continuing to deliver safe care in the event of system or network problems

4. WORKING WITH INFORMATION

The competences in this section relate to holding, obtaining, recording, using, sharing and disposal of healthcare related information to recognised ethical, legal, professional and quality standards. Information and communication technologies can be used to facilitate information recording, storage and retrieval. Patients expect their information to be managed safely and securely.

Information governance is about the structures, policies and practice necessary to ensure the confidentiality and security of information and the ethical use of that information for the benefit of the individual to whom it relates and for the broader public good. All doctors and dentists need to be aware of information governance principles and standards and adopt these in their clinical practice.

Information is also necessary for supporting clinical audit, research, disease surveillance, service planning and resourcing and for optimising healthcare delivery through performance monitoring and quality improvement measures.

Clinicians need to communicate with patients and other healthcare professionals using a range of technologies and may also need to share information with social care sectors or external agencies. They must therefore be aware of the requirements for safe and secure data handling.

Healthcare is increasingly an information-driven activity, therefore the quality of data is of critical importance. Clinicians need to be able to rely on the accuracy of information available and all healthcare organisations and staff have a responsibility to ensure the data that they create and use is of the highest quality and fit for purpose.

4.1 Collection and storage of health information

Objective:

- *Be able to obtain, record and hold information from patients and carers in accordance with recommended standards from professional bodies and any legal requirements*

Knowledge

Understand the need to have a clear purpose for collection of any health information and to comply with data protection principles by only recording and storing information that is absolutely necessary³⁰

Understand Caldicott and Data Protection principles in relation to the relevance, quantity and quality of information obtained and stored

Understand how to manage deceased patients' information in accordance with the Access to Health Records Act 1990³¹

Understand the difference between anonymised and pseudonymised information and situations where they are required

Understand the need to inform patients about the collection and use of their information for the delivery of healthcare and be aware of mechanism by which this can be achieved

Understand what is meant by the terms consent and opt out and how these must comply with the Data Protection Act^{32 33}

Know the requirements for obtaining consent in cases of children, vulnerable adults or others where capacity is a issue

Be aware of sources of information, advice and guidance in relation to maintaining patient confidentiality^{34 35 36 37}

Understand and interpret relevant legislation and accountability frameworks

Know where to go for help and advice relating to safe processing of information³⁸

Understand the advantages and disadvantages of different electronic methods of obtaining and recording information in healthcare

Have awareness of different approaches to storing patient information, and the advantages and disadvantages of using different approaches e.g.

- relational databases
- content management systems
- file systems

Skills

Apply professional, ethical, legal and policy standards in processing of patient information at all times

Communicate effectively to individuals to explain the purpose for which their personal information will be used and advise where to seek further guidance in relation to queries about recording and storage of their personal information

Provide accurate and effective guidance to colleagues regarding patient confidentiality in relation to processing of health information

Store and destroy information in line with national guidance and local retention and destruction policies

Develop and use policies and strategies to ensure confidentiality is maintained e.g. anonymisation of data

Discuss and negotiate relevant approaches to storing of patient information

Provide evidence of information governance awareness and training as part of appraisal and revalidation

Behaviours

Respect an individual's right to confidentiality and follow the guidance provided by professional and regulatory bodies i.e. General Medical Council and General Dental Council

Use information with the highest regard for confidentiality, and encourage such behaviour in other members of the healthcare team

Promote the need for team, department or organisational policies and procedures for maintaining confidentiality

Recognise and respond to breaches of confidentiality effectively

Maintain professional integrity by the adoption of best practice standards for collection and storage of health information

Recognise when to seek early advice from information governance leads, the Information Commissioner and professional bodies in relation to processing of personal information

Recognise the need to balance privacy of health information with improved healthcare delivery and health system management

4.2 Safe care of clinical information

Objectives:

- *Be able to manage healthcare information in a safe and secure manner, using a variety of technologies, so that confidentiality is maintained*
- *Recognise the risks of poor information handling and understand what steps to take to address them*

Knowledge

Understand national information governance standards and procedures applicable to storage, retention and safe disposal of information held in medical records, including electronic patient records ^{39 40 41}

Understand the principles of effective quality control and validation of data and information in clinical practice

Understand who is entitled to access health information in relation to local policy and to the Data Protection Act ⁴²

Understand the procedures relating to staff identification and authentication and awareness of tools to support staff identification, such as smart cards, tokens and biometrics

Have awareness of different models of controlling access to information held electronically to prevent unauthorised access or access against a patient's wishes e.g. role based access, "break glass" function, sealed envelopes and consent-based approaches

Understand why it is important to choose an appropriate password and the need to update it regularly

Understand the procedure, and information governance standards, for electronic transfer of clinical information or medical records

Be aware of different approaches to transmitting information including data transfer services, email and messaging. Recognise the advantages and disadvantages of different approaches

Understand the technical and operational risks associated with the transfer and transportation of records or data

Be aware of the need to ensure that transfer of information outside the European Economic Area complies with data protection principles

Understand the need for formal policies and protocols for the use of information outside the workplace

Understand the need for an asset register of portable devices and portable media and the ability to restrict unauthorised access to information contained on these through encryption or password protection

Understand the threats to data security including accidental viewing, unauthorised or uncontrolled access, malicious damage and risk of transfer of data to external media

Have awareness of solutions to manage security of data, systems, devices and networks

Knowledge

Understand procedures to be followed in the event of data breach or loss ^{43 44}

Understand principles of system audit and have awareness of tools available to support privacy breach detection. Understand the need to have processes in place to take remedial action, if required

Skills

Follow and promote procedures and principles to ensure information is only accessed by healthcare professionals with a legitimate right

Explain clearly to patients how their information will be stored and shared and what choices they have to control these processes

Develop and apply organisational principles and protocols for the security of personal information

Put in place processes for ensuring relevant policies and procedures continue to be effective and sustainable

Identify and manage risk in relation to safe care of clinical information

Comply with local policy and protocol for dealing with confidential information outside the workplace

Develop local strategies for data quality assurance

Develop team, departmental or organisation policy and protocols to deal with any data breaches or loss

Behaviours

Exhibit professionalism when in trust of patient information

Ensure availability of staff authentication and access protocols

Recognise the need to observe the password policies of an organisation

Recognise the need for continuous audit and monitoring of access to clinical IT systems to identify breaches of confidentiality and unauthorised access and the need to take remedial action, where necessary

Recognise the obligation to report security breaches and threats such as user impersonation and malicious attacks including viruses and worms

Encourage compliance with information governance standards relating to storage, retention and transfer of health information

Support implementation of, and follow, appropriate security policies and procedures

4.3 Using and Sharing health information

Objectives:

- *Understand effective and valid information flows within the healthcare system which are necessary for delivery of clinical care*
- *Demonstrate understanding of the use of clinical information for purposes other than direct patient care and how this information should be handled safely and securely*

Knowledge

Understand and apply the Information Commissioner's Office statutory code of practice on data sharing ⁴⁵

Understand the information flows which take place between different sectors of health and social care, including those providing data for national clinical audit and central returns

Be aware of information classification schemes e.g. sensitivity and how these are part of managing appropriate access to health information

Understand the referral pathways which take place between different sectors of health and social care

Understand the ways by which information is used to support transfer of care between clinicians in and out of hospital and between community and social health sectors

Understand different communication methods and technologies and their appropriate application in support of clinical practice

Have awareness of current means of information sharing including electronic referral systems, GP to GP (including general dental practice) record sharing and shared electronic health records

Have awareness of future possibilities for effective electronic sharing of patient-related information

Understand the procedures for seeking an individual's consent for disclosure of identifiable information to others

Understand the term "secondary use" and what it means in relation to patient health and social care information

Understand secondary uses of patient related information for

- disease surveillance and public health activities
- health audit and research
- healthcare planning and commissioning
- clinical governance
- teaching and education

Understand the different regulations applying to use of anonymous versus identifiable data and when the use of either is appropriate

Understand professional, ethical and statutory requirements for patient confidentiality and sharing of clinical information

Knowledge

Understand when personal information should or should not be disclosed after a patient's death

Know the role of the Caldicott Guardian and Information Governance lead within an organisation and the process of attaining Caldicott approval for sharing with third parties^{46 47 48}

Be aware of situations where disclosure is not optional e.g. child protection, vulnerable adults, law enforcement, Public Health

Understand what type, and how much, information can be disclosed to the police or to legal representatives. Recognise the different responses that are required

Understand the requirement for a formal contractual relationship between a data controller and a data processor under the Data Protection Act

Understand the requirement to devise formal data sharing agreements to promote best practice in any formal and ad hoc data sharing

Understand the duties of NHS organisations to comply with the Freedom of Information Act 2000⁴⁹ or Freedom of Information (Scotland) Act 2002⁵⁰

Skills

Identify specific risks in relation to health information exchange between different healthcare systems

Provide advice and guidance relating to the circumstances under which information can, should and must be shared

Advise patients about the implications of refusal to consent to record or share personal information

Develop strategies to support the effective and appropriate use of information for secondary purposes, ensuring compliance with the second principle of the Data Protection Act

Lead development of policies for information sharing in accordance with national guidance and relevant legislation

Develop local strategies to support the effective and appropriate management of requests for information under the Freedom of Information legislation

Provide timely information to ensure statutory timescales for responding to Freedom of Information requests are met

Behaviours

Recognise the benefits and risks of electronic sharing of information

Appreciate the need for, and the value of, the secondary use of healthcare information

Ensure that patient identifiable health information is effectively protected against improper disclosure at all times

Ensure that those receiving information respect and treat confidential information appropriately

Promote safe and secure information sharing and transfer between healthcare providers in compliance with the Information Commissioner's Office statutory code of practice on data sharing

Seek advice from local information governance experts, the Information Commissioner's Office, legal and professional bodies in the event of ethical dilemmas over disclosure and confidentiality

Recognise the need to share information with statutory bodies without patients' consent in some circumstances

Recognise the problems posed by disclosure in the public interest, without patients' consent, as defined by law

Recognise the need to comply with requests for information under the Freedom of Information legislation

5. CLINICAL CARE RECORDS

Good record keeping is an essential component of patient care. The competences in this section relate to the:

- Creation of health records to recognised professional standards and guidance
- Transition from a widely paper based system to electronic patient records.

Health records are used to support direct patient care by acting as the basis of evidence for individual clinicians, supporting clinical decision making and providing an important means of communication with colleagues and patients. They detail outcomes of encounters with healthcare professionals and healthcare institutions. Health records provide a legal record of care given and can act as a source of data to support clinical audit, research, disease surveillance, service planning, resource allocation and performance management.

Traditionally the health record has been a clinician view of the transaction between patient and clinician. In the future the record will become a shared enterprise with patients directly accessing their full or partial record, which may contain not only a wider range of personal health, social and demographic data but also information and knowledge resources.

5.1 Health Records

Objectives:

- Awareness and promotion of professional standards relating to the structure and content of health records
- Understand how electronic health records can be developed and the role these may have in supporting information flow between healthcare professionals, social care, third sector and patients themselves
- Understand the importance of positive patient identification in healthcare processes and how patient identity is managed in the different UK countries

Knowledge

Understand current guidelines and standards pertaining to the creation, use, retention and destruction of health records^{51 52}

Understand the basic structures, use and storage of patient health records, including patient held records

Be aware of archiving policies, media and storage options for health records

Understand the need for health record structure and content standards to ensure clinical data can be stored reliably, retrieved and shared between information systems⁵³

Understand the advantages and disadvantages of narrative vs structured documentation in health records. Be aware of issues to consider when designing methods of recording structured information

Understand the need for information recorded to be clear and accurate

Understand that information can be added or amended but not changed or erased

Understand the role of health records to support communication in healthcare and as a medico-legal record of care given

Understand the role of health records in supporting

- clinical decision making
- communication about patient preferences and choices
- health management with patients
- clinical audit and research
- clinician appraisal and revalidation
- performance monitoring, including clinician and executive dashboards
- financial planning and distribution of healthcare resources
- epidemiology and public health

Understand the benefits, limitations and risks of Electronic Patient Record systems

Be aware of different identifiers used for positive patient identification e.g. National Health Service number, Community Health Index (CHI) number, hospital number

Knowledge

Understand the role of Master Patient Indexes (MPI) and demographic services in patient identity management and be aware of the benefits, limitations and risks of each

Understand the risks associated with patient identity mismatches and duplicate records and recognise how clinicians can be alerted about the possibility of these occurrences

Understand the role of individuals and business responsibility and accountability for the control of records

Skills

Record information about patients clearly in the notes following professional guidelines using appropriate methods for structuring information

Keep accurate, comprehensible, timely and complete clinical records

Use current guidelines and standards, where available, in the design and specification of effective clinical documents and electronic clinical record systems

Facilitate iterative review and design of health records systems

Develop policies to ensure accurate patient identification in healthcare IT systems

Behaviours

Recognise the importance of good record keeping within healthcare organisations and promote good record keeping practice to colleagues

Recognise the role of information and communication technologies in enhancing clinical information recording, storage and retrieval and information flows in general

Promote the need for accurate patient identification to improve data quality and reduce clinical risk

Recognise the particular value of multidisciplinary or shared clinical records, notes or assessments in improving information flow and clinical handovers

5.2 Patient access to health information

Objectives:

- Recognise that data about the patient is for the patient; that the clinician is a custodian of the data, not the owner of the data, and that the patient or their authorised representative have a right to apply to see or obtain a copy of certain personal data held about them, including health records
- Clinicians should be able to provide informed support to patients on:
 - o The range of online sources patients use to obtain information about their health, medical conditions and availability of services, including search engines, websites, discussion groups and social networks
 - o The interactive services available to patients to support their health care needs, including (where available) online clinic booking, repeat prescriptions, and telehealthcare
 - o Patient accessible electronic health records and patient held electronic personal health records.
- Recognise that patient-controlled systems can improve their experience of healthcare and empower them to become equal partners in the care process

Knowledge

Understand the importance of information to patients and the potential value of information gathered from the Internet in informing patients' decisions

Be aware of sources that patients are likely to use to find information about healthcare, both in general and in relation to their specialty ^{54 55 56 57}

Be aware of the extent of health information available to, and generated by, patients, especially those living with a long term condition. Understand the impact of this on the clinician/ patient relationship

Understand the term "expert patient"

Be aware of the concept of web-based health services (i.e. interactive and transactional services) and with specific services available to their patients, such as online booking and repeat prescriptions

Be aware of the policy context, risks, and benefits of patient accessible electronic health records and patient held electronic personal health records

Be aware of the range of services available to enable patients to view and edit their own medical and related records, including patient accessible electronic health records and patient held electronic personal health records.

Have awareness of mechanisms that may be used for patient authentication and authorisation

Know the term "Subject Access Request" and understand the process to enable patients, or their nominated proxies, to access their own medical records ^{58 59}

Have awareness of sources of guidance and advice available to patients in relation to gaining access to their health record or other information held about them e.g. Health Rights Information Scotland (HRIS) ⁶⁰

Understand patients' rights to have factual inaccuracies corrected and a note of disagreement inserted into their records where a difference of opinion exists

Understand how indicators of performance and quality can help patients and service users make informed choices about preferences for organisations involved in delivering clinical care

Skills

Advise patients on good quality sources of information and be able to direct patients to librarians and other information specialists

Edit Wikipedia articles relevant to your area of specialist expertise to improve their quality

Provide the URLs for several good quality web resources covering the conditions you commonly treat and/or good quality generic patient information portals

Apply policies and practices in respect of requests from patients or their representatives for access to health records and related information

Advise patients of local sources of help and advice relating to accessing information held about them

Work with patient groups to gather requirements for, develop, implement and assess benefits of patient health information systems

Behaviours

Recognise the rights of individuals to a copy of information held about them and the rights of parents or carers to review information about their dependents

Recognise how having a copy of their records provides patients with evidence-based information to help them make decisions about self care

Recognise the benefits of being a trusted provider of information to support shared decision making

Support patients to use information to best effect, empowering them to take a partnership role in the care process

Support patients when accessing electronic health records, maximising the benefits and minimising the risks

Recognise that providing patients and carers with access to health records can improve data quality

Recognise the implications of patient held and patient accessible information for inter-professional clinical practice and multidisciplinary care

Support the concept of mutuality and shared decision making

Recognise the contribution that patient health information systems have to improving health literacy

Recognise the risks associated with inequitable access to, and use of ICT, in the general population may have on increasing health inequalities across the population

6. CLINICAL IT SYSTEMS AND TECHNOLOGIES

Healthcare is delivered across many organisational settings. Effective working in this Integrated healthcare environment requires clinical systems to “talk” to each other reliably and safely.

Clinicians need to have a good understanding of the clinical systems and applications available to support patient care and how to use those applicable to their own practice. They should be familiar with the role, functions and benefits of local systems and applications and should also understand the purpose and function of systems implemented at a national level within their own country.

Information technology is able to support clinical practice and new ways of working, such as electronic order entry systems, Picture Archiving and Communication Systems (PACS) and electronic systems to support medicines management.

Clinicians need to be aware of current and emerging technologies and how they can be used in healthcare to improve communication between healthcare professionals, patients and carers, or to support more efficient and safe delivery of clinical care. Technology can also be used for the identification of patients, drugs and blood products, reducing the risk of harm from administration to the wrong patient. Use of radiofrequency identification also enables NHS organisations to manage their assets more efficiently.

Telehealthcare encompasses both telehealth and telecare. Telehealth describes a range of initiatives aimed at providing better, local and faster access to clinical services. Telecare supports patient monitoring and management at home to reduce admission rates to healthcare organisations and to enable self care and independence.

6.1 Integrated Healthcare

Objectives:

- *Understand differing models of IT system deployment in a healthcare environment, where care is provided across many different organisational settings*
- *Understand the mechanisms by which IT systems can be joined together reliably and safely to support information flows across the health service*
- *Understand the content, functionality and benefit of an integrated health record*
- *Recognise that for successful interoperability or integration to be achieved systems must either adhere to certain informatics standards or rely on middleware to supplement any technology or data transformations resulting from lack of standardisation*
- *Understand the best approach to consistent interpretation, implementation and management of any available standards to ensure successful cross-organisation integration*

Knowledge

Have awareness of the terms “organisation centric”, “clinician centric” and “patient centric” IT systems, and be able to provide examples of each

Be aware of the benefits, limitations and risks of organisation centric, clinician centric, patient centric and mixed models in relation to ability to implement, professional practice change, information sharing, interoperability and maintenance costs

Understand the need to address cross-organisational business processes and multidisciplinary working and be aware of information governance policies that govern cross-organisational data sharing

Be aware of the NHS guidelines for interoperability of healthcare systems at a national and international level

Have awareness of different strategies for system integration

Understand the importance of standardisation and its wider implications for success

Understand the role of standards in system integration, including standards for structuring clinical information and standards for messaging

Be aware of web portal technologies to deliver an integrated health record and the benefits and risks of this method compared with system integration

Knowledge

Have awareness of tools to support delivery of an integrated health record e.g. single sign on technology, record locator service

Have awareness of sources of information contributing to integrated health records including patient record stores, primary care IT systems, hospital patient management systems, specialty and other local databases and document repositories

Be aware of the clinical functionality that can be provided via an integrated health record to support patient care, including clinical noting and documentation, referrals, test requesting and prescribing

Skills

Identify benefits and risks in relation to system integration or non-integration within and between healthcare systems

Identify specific risks in relation to health information exchange between different healthcare systems

Communicate effectively with technical staff in relation to system integration and information exchange

Define cross-organisational business requirements to meet the needs of all those disciplines that will utilise the information.

Behaviours

Listen to colleagues from different professional backgrounds in developing specifications for integration of IT systems

Recognise how portal technology can support information sharing across healthcare domains

Consider the constraints implied by standards and consciously apply these to any healthcare integration design

Promote the need for standardisation of information to allow others to interpret the information accurately and safely

Appreciate the electronic support that can be delivered via an integrated health record, including alerting of abnormal test results, prescribing conflicts and early warning scores

6.2 Clinical IT systems

Objectives:

- *Understand how clinical IT systems support healthcare business processes*
- *Understand how primary care IT systems support comprehensive, life-long clinical records and how information from other health and social care sectors is incorporated into these records*
- *Recognise how clinical IT systems within acute, community and mental health sectors can support safe and effective clinical practice*
- *Recognise how these systems can contribute to improving patient safety, and quality assurance*
- *Recognise how systems facilitate health screening and disease surveillance*
- *Recognise how information in clinical IT systems can be used for secondary uses, such as audit and research, service planning and resource allocation*

Knowledge

Have awareness of the evolution of IT systems across different healthcare sectors and demonstrate an understanding of the clinical IT systems currently in use in Primary Care, hospital and community settings

Understand the advantages and disadvantages of patient focused versus specialty or disease focused systems

Be aware of the potential functionality of primary care IT systems including:

- appointment scheduling
- referral
- recording patient information as part of an electronic health record
- document management
- electronic prescribing
- reporting (e.g. in relation to payments)
- supplying information for unscheduled care
- call-recall
- decision support

Understand how clinical information from hospitals, community and social care can be incorporated into the Primary Care health record

Knowledge

Be aware of the potential functionality of Patient Management Systems including:

- appointment scheduling and referral management
- patient registration and identification
- recording admissions, transfers and discharges
- waiting list and bed management
- billing
- electronic order entry
- electronic prescribing
- clinical documentation and charting
- handover and communication between healthcare providers
- decision support
- risk profiling

Understand how clinical decision support can be incorporated into workflows within IT systems

Understand the types of clinical information shared electronically between healthcare providers, the mechanisms by which this can be achieved and the benefits and limitations of different approaches

Understand how records can be transferred between primary care practices electronically

Be aware of the types of information that are extracted from primary care systems for secondary use and reporting purposes, such as Quality and Outcomes Framework ⁶¹

Understand the types of information extracted from hospital clinical systems for national statutory reporting (e.g. waiting times, bed occupancy) and where to obtain more detailed information, if required

Be aware how information from these systems may be used for practice or organisational performance management and quality assurance

Understand the unique complexities and challenges of implementing clinical IT systems for community based clinical staff

Know how intelligent and adaptive systems might change clinical IT systems in the future

Skills

Use clinical systems during consultations whilst maintaining rapport with the patient

Use clinical systems to retrieve and record information into clinical records and perform other clinically relevant tasks.

Use expert and web-based information systems and clinical care pathways in clinical practice

Behaviours

Promote the need to optimise data quality within clinical IT systems

Encourage clinical colleagues to exploit the maximum potential from existing IT systems

6.3 Electronic test requesting and results reporting

Objectives:

- *Understand how computerised order entry systems can be used for test requesting and the risks and benefits associated with this process*
- *Appreciate how messages are transferred between clinical and laboratory systems*

Knowledge

Be aware of the functionality of a computerised order entry and results reporting system

Understand the need to integrate with other systems, such as laboratory systems, and recognise how messages are transferred between systems using approved standards

Understand the benefits and risks of electronic test requesting using order entry systems compared with traditional paper-based processes

Understand the benefits and risks of on-line results review

Be aware of the workflows and processes in laboratories which may affect their ability to implement electronic order entry systems

Skills

Complete orders for laboratory tests or other investigations using electronic order entry systems

Review and manage results electronically

Undertake specification, configuration or implementation of computerised order entry systems

Behaviours

Recognise and promote the value of order entry and results reporting systems in improving the quality and safety of patient care

Recognise how computerised order entry systems can encourage standardisation of clinical practice and adherence to local policy and guidelines

Recognise that order entry systems need to meet the requirements of laboratory, and other clinical support service staff as well as those of clinicians

Work collaboratively with laboratory or other clinical support service staff to ensure electronic test requesting and results review systems are of benefit to clinicians in their working practice

6.4 Digital Imaging

Objectives:

- *Understand how access to digital imaging using Patient Archive and Communication Systems (PACS) can improve delivery of clinical care and allow different models of service delivery*
- *Recognise the longer term consequences of digital image storage on cost to the health service and measures that need to be implemented to ensure future affordability*
- *Understand the interface between Radiology Information Systems (RIS) and PACS and the functionality of RIS*

Knowledge

Have awareness of adoption and use of PACS across the UK

Understand how PACS implementation has:

- improved critical decision support
- enabled remote consultations
- enabled remote reporting of images by Radiologists
- reduced the need for patient transfer
- supported delivery of healthcare in remote and rural communities

Have awareness of image management and display issues e.g. image acquisition, image standards, image compression and image transmission

Be aware of the existence of local, regional and national image archives and associated storage and retention policies

Understand the benefits and risks associated with the use of picture archiving and communication systems

Be aware of other types of images, other than Radiology images, which may be included as part of a PACS

Skills

View and manipulate images using PACS

Undertake specification, configuration or implementation of RIS or PACS

Articulate the need for local and national image storage and retention policies to clinical colleagues to ensure future affordability

Behaviours

Recognise and promote the value of electronic order entry and results reporting systems in improving the quality and safety of patient care

Recognise the value of digital images, and of PACS, as an integral component in the evolution of the electronic patient record

Recognise the positive impact of PACS implementation on promoting the benefits of IT healthcare systems to the clinical community

Appreciate the workflows and processes in Radiology departments

Recognise that RIS and PACS need to meet the requirements of radiology staff as well as those of clinicians

6.5 Medicines Management

Objectives:

- *Understand that medicines reconciliation encompasses the collection of a full, current list of medicines, which may be prescribed from different sources*
- *Recognise that shared medication records have the potential to reduce medication errors and aid the reconciliation process*
- *Appreciate how electronic systems can facilitate and enhance the communication of a prescription or medicine order, aid the choice, administration and supply of medicines through knowledge and decision support and provide a robust audit trail for the entire medicines use process*
- *Understand the common prescribing functions of Primary Care systems and how these interface with community pharmacy systems*
- *To understand how technology can improve the medicines administration process and provide data to support quality improvement*

Knowledge

Understand the term “medicines reconciliation” and the difference between this and a simple drug history

Be aware of sources of medication information that may be used for medicines reconciliation

Understand how electronic systems may aid, influence or introduce risk into the reconciliation process

Understand the rationale for shared information about medicines to support individual patients’ care

Understand the complexities of translating free-form text based prescriptions into a structured machine-readable format

Be aware of the incremental processes healthcare institutions can adopt prior to implementation of full ePrescribing

Have awareness of ePrescribing systems in use across the UK and how systems have been developed to support the medicines use process

Be aware of common prescribing functions of prescribing systems and the additional tools to aid medicines management e.g. generic medicines switching programmes

Understand the need to manage the potential unavailability of ePrescribing and drug administration systems and possible mitigating strategies

Understand how primary care electronic prescriptions interface with other electronic systems, including Electronic Prescription Service (EPS) and systems used in community pharmacy settings

Be aware of different drug dictionaries used within ePrescribing systems e.g. NHS Dictionary of Medicine and Devices (DM+D)⁶² and how the use of such information sources can influence system set-up and behaviour

Understand the difference between active and passive decision support and how these are used in different systems and/or for different purposes

Understand how rules can be built into prescribing systems directed at reducing harm from inappropriate medication use

Understand the potential for unintended consequences of ePrescribing implementations, including concepts such as alert fatigue

Understand how electronic systems can support the supply of medicines in hospitals in a timely fashion

Understand the requirement to interface prescribing and dispensing processes and systems to reduce the risk of errors

Have awareness of technologies relating to patient identification within the medicines administration process, including Radiofrequency Identification and bar-coding

Be aware how decision support or alerts can work in the medicines administration process

Skills

Communicate accurate information about medicines across different healthcare settings

Identify methods of electronic communication that allow for shared medication records between healthcare providers

Lead development of policies to ensure that national recommendations for exchange of information about medicines are utilised

Identify the benefits and risks of ePrescribing implementations

Identify how ePrescribing systems may enhance and promote high quality and safe patient care and reduce costs to the health service

Identify how alerts can be used to best effect within electronic prescribing systems

Undertake specification, configuration or user acceptance testing of ePrescribing systems

Ensure that accurate lists of medications are transmitted between healthcare settings to avoid inappropriate or omitted therapy

Use IT prescribing tools, where available, to improve safety and identify where ePrescribing systems may introduce new hazards into clinical processes

Identify socio-technical issues within ePrescribing systems and with the use of clinical decision support

Behaviours

Appreciate the role of different healthcare professionals in managing medicines in individual patients

Recognise and promote the importance of medicines reconciliation to reduce risks to patients

Recognise the need for audit to ensure that medicines management policies are in place

Recognise the value of a complete medication record across primary and secondary care

Recognise the complexity of implementing ePrescribing systems to health care settings

Recognise the importance of having multidisciplinary input to procurement, implementation and maintenance of electronic prescribing systems

Appreciate the effect of different types of prescriber, including non-medical prescribers, on the use of ePrescribing systems

Promote policies that support the medication administration process including double-checking, positive patient identification, and patient self-administration

Audit the medicines administration process to provide evidence of drug omissions in hospitalised patients

6.6 Infrastructure and Technologies

Objectives:

- *Understand the infrastructure requirements for IT enabled healthcare*
- *Understand the requirements for hardware deployment across the healthcare sector to meet the demands of the clinical environment and to comply with infection control regulations*
- *Recognise how technologies can be used to improve communication between healthcare professionals and ensure efficient service delivery*
- *Recognise that rapid advancements in technology will influence future delivery of clinical services*

Knowledge
Be aware of NHS local and wide area networks and the benefits and limitations of these
Be aware of different desktop operating systems (e.g. Windows, Linux) and productivity suites (e.g. Microsoft office). Recognise the benefits and limitations of using different systems and products on service provision, interoperability and cost
Understand the capabilities of Personal Digital Assistants (PDAs), Tablets, mobile telephones and other devices to support viewing and recording of clinical information at the point of care in wireless enabled environments.
Understand the need for appropriate encryption of portable media where personal data are being processed
Be aware of the requirements for hardware deployment in the healthcare sector to ensure resilience in the clinical environment and to meet infection control regulations
Be aware of the current mechanisms for providing secure messaging between healthcare providers and consider how requirements may change in the future
Be aware of emerging information and communications technologies and their application in health
Understand how the latest Web technologies enhance creativity, communications, secure information sharing, collaboration and functionality of the web
Understand how 2D and 3D bar codes can be used for positive patient, drug, or device identification
Understand how radiofrequency identification (RFID) techniques can be used to track assets, such as equipment or devices, or to track patients
Understand the difference between active and passive RFID and the security requirements associated with active RFID tagging to ensure confidentiality ⁶³

Skills

Identify where new technologies could be used to improve efficiency and reduce risk

Identify where existing technologies could be utilised more effectively to maximise return on investment

Identify where Web technologies may be relevant to current or future healthcare

Use Web technologies to develop web culture communities and hosted services, such as social networking sites, video sharing sites, wikis and blogs for patient or staff education or support

Host or participate in clinical meetings using video conferencing or other technologies, such as web conferencing

Behaviours

Promote innovative ways of delivering healthcare while recognising the need to protect confidentiality

Appreciate where technologies can help clinicians deliver more timely and efficient care

Promote use of video conferencing, or similar functionality, as an efficient use of clinical time and financial resources

Keep up to date with advances in technology which may support more efficient delivery of care or optimise communication

6.7 Telehealthcare

Objectives:

- *Understand how telehealth can improve access to specialist treatment and can support regional models of service delivery*
- *Recognise the role of telecare in helping individuals to stay independent at home, and the support it can give to their carers*

Knowledge
Understand what is meant by the terms telehealthcare, telehealth and telecare
Understand the benefits that telehealth initiatives, such as video conferencing and digital imaging, may have on: <ul style="list-style-type: none">• supporting delivery of healthcare remotely• improving critical decision support• enabling remote consultations• reducing the need for patient transfer• managed clinical network activity
Be aware of telephone triage and support services, such as NHS Direct and NHS24
Be aware of local and national telehealth programmes, the benefits derived from these for patients and the impact on clinical service delivery
Have awareness of telecare initiatives, such as activity and lifestyle monitors and mobile sensors, and where these may be used to support health and social care at home
Understand how telehealth and telecare initiatives can: <ul style="list-style-type: none">• empower patients with long term conditions to manage their own condition• avoid unnecessary hospital admission• reduce the use of care home beds• provide support for both patients and carers• provide access to specialist services (e.g. pulmonary rehabilitation)
Have awareness of both the benefits, limitations and risks of telehealthcare and telehealthcare equipment
Understand the requirements for a confidential environment to share information or images

Skills

Undertake clinical tele-consultations with patients

Advise and guide individuals on telehealthcare service delivery

Inform patients of their rights not to participate in a telehealthcare encounter or service and of alternative options available to them

Assess proposed telehealthcare services, and their respective benefits and costs, against existing or alternative service models

Contribute to communication strategy about telehealthcare activities and successes to inform healthcare staff, partner agencies, patients and carers

Behaviours

Recognise that telehealthcare can promote patient independence and enable self care

Appreciate the role telehealth can have in providing more equitable access to specialist clinical services

Protect patient confidentiality and behave in accordance with professional standards during telephone or video conference encounters

Ensure that users of telehealthcare services are aware of who is participating and the respective participant role

Support staff involved in telehealthcare to obtain knowledge, training and experience as appropriate to their role

Recognise the need to protect patient confidentiality and dignity during telehealthcare encounters

Recognise how telehealthcare services contribute towards wider local and national Health and eHealth strategies

Recognise the contribution telehealthcare has to reducing the carbon footprint

7. KNOWLEDGE MANAGEMENT

The competencies in this section relate to the translation of knowledge and evidence that can feed electronic systems including use of guidelines, third party decision support information, and evidence-based clinical pathways.

Technologies can also be used to facilitate the attainment of clinical knowledge and skills and continued professional development.

7.1 Decision Support

Objectives:

- *Recognise how decision support, clinical guidelines and evidence based clinical pathways within clinical IT systems enhance delivery of clinical care, particularly when embedded into clinical workflows*
- *Understand the risks associated with decision support and how these risks are identified and mitigated for any implementation*

Knowledge

Understand the various types of decision support systems, including passive, action rules and computer-interpretable guidelines, and the evidence for the effectiveness and limitations of each type

Understand the role of decision support systems in delivering the evidence base of healthcare to the point of care

Understand that decision support systems should allow flexibility of clinical practice to meet the requirements of different individuals

Understand that well designed decision support can enhance clinician knowledge

Understand the risks and benefits of core systems

Understand how national and local clinical guidelines can be hosted or incorporated into electronic systems to enhance standardised patient care

Understand how information can be accessed and/or integrated with systems to support guideline or pathway assisted healthcare decisions

Understand the sources of information that drive embedded decision support, including third party information and other specific tools

Understand the different ways by which guidelines can be integrated into electronic systems e.g. links to on-line guidelines, by specific pointers or through integrated decision support

Have awareness of the different tools and methods for appraising guidelines, decision support tools and the evidence they access

Understand the risks associated with decision support systems and the processes needed to validate such systems, including risk assessment and mitigation at the technical, content, end user, and organisational levels

Understand the clinical transformation requirements for implementing decision support systems

Be aware of the current status of research and development in the area of Computer Added Diagnosis tools and personalised medicine, in particular the use of biomarkers, image analysis and other tools for managing treatment

Skills

Undertake design of systems for clinical situations

Search the medical literature to find new guidelines or clinical pathways

Develop clinical guidelines, decision support tools, and evidence based clinical pathways

Lead multidisciplinary discussions about the risk-assessment, risk mitigation and validation of a decision support system

Influence others to use knowledge and evidence to achieve best practice

Behaviours

Promote the use of guidelines and care pathways within different healthcare settings

Remain up to date with current guidelines in order to ensure these are implemented in local systems

Participate in multi-disciplinary discussions about the development and use of guidelines and question its integrity, validity and provenance

Maintain an open and critical mind to the information displayed by clinical systems

7.2 eLearning

Objectives:

- *Recognise the relevance of eLearning and how it can be designed and used to achieve curricular objectives and promote better patient care*

Knowledge
Understand the meaning and potential of eLearning
Understand the strengths and weaknesses of an eLearning approach
Understand the principles of good writing for the web
Understand the principles of good module navigation
Understand the different pedagogical approaches in eLearning to deliver more engaging, stimulating and memorable content
Be aware of the concept, strengths and benefits of blended learning
Understand the potential innovative application of emerging technologies to improve overall content production and delivery
Be aware of disparate mechanisms of eLearning delivery including web-based learning, computer-based learning and training, virtual classrooms and digital collaboration
Be aware of the mechanism and application of live or recorded web-streaming
Have awareness of learning management systems and learning content management systems
Be aware of different mechanisms of evaluating effectiveness of eLearning
Understand the impact of equality, accessibility and diversity on the development and provision of e-resources
Understand the limitations of NHS networks on the development of e-resources
Understand the strengths and limitations of learning resources accessed by personal devices

Skills

Design innovative and effective eLearning modules

Use eLearning products to enhance personal professional development

Lead multi-professional review of eLearning products

Demonstrate how individual eLearning modules contribute to acquisition of specified curricular objectives

Behaviours

Recognise the skills and expertise brought by other professionals in eLearning

Participate in eLearning and maintain records of this

Recognise the need to maintain up to date knowledge as eLearning continues to develop

Recognise complexity of systems and the need to deliver eLearning solutions in association with other more conventional teaching and training



8. CLINICAL AND HEALTH IT STANDARDS

The use of terminologies, codes and classifications is essential for a transition to an information driven National Health Service. Terminologies and classifications allow the coherent and interoperable collection of operational clinical and management information to demonstrate excellence and shortcomings in care at individual, local and national levels.

Clinicians also need to be aware of the role of coding, clinical terminologies, classifications and vocabularies in delivering safer patient care.

In addition to clinical standards for information there are also technical standards which apply to the electronic capture, storage, display and exchange of information. Technical standards facilitate interoperability between systems, the secure handling of information and ease of use.

Clinicians need to be aware that this is a complex area which typically results in some form of prioritisation and trade offs and in turn requires an understanding of implications and risks.

8.1 Clinical Coding and Terminologies

Objectives:

- *Understand the purpose of coded clinical data, the uses to which it is put and the respective roles played by clinical terminologies, classifications and vocabularies in delivering safer clinical care*

Knowledge
Understand the basis, application and limitations of different clinical coding systems, classifications and related vocabularies
Understand the advantages and disadvantages of fully coded, part coded and unstructured information in electronic health records
Understand the meaning of terms such as: <ul style="list-style-type: none">• Coding system• Terminology• Vocabulary• Ontology• Classification• Meta data
Understand how the use of codes and terminologies implies a particular meaning and that information transfers need to preserve this meaning
Understand how shared vocabularies facilitate the accurate transfer and interpretation of information
Be aware of the limitations in being able to preserve meaning when translating between vocabularies
Be aware of Clinical Terminologies used in clinical IT systems, such as the Read codes Clinical Terms Version 3 ⁶⁴ and SNOMED – CT (Systemised Nomenclature of Medicine Clinical Terms) ⁶⁵
Be aware of national standards and conventions used by the NHS in coding clinical data e.g. ICD -10 (International Statistical Classification of Disease and Related Health Problems -10th edition) ⁶⁶ and OPCS-4 (Office of Population, Censuses and Surveys Classification of Surgical Operations and Procedures). ⁶⁷ Recognise where these standards are used
Understand how data is coded within healthcare organisations and the role of clinical coders in this process
Understand the importance of coded data beyond the individual health record e.g. evidence for clinical research, evidence for revalidation, management information, epidemiology, Public Health and the conduct of national audit
Have awareness of the role of codes and terminology in decision support software
Understand the importance of coded data for NHS financial planning and how the accuracy of coded data can affect local funding e.g. Payment by Results

Skills

Use terminology and classifications appropriately, both in terms of individual patient care and clinical audit of care

Interpret health information derived from individual data items

Behaviours

Recognise the power of information to demonstrate excellence and highlight shortcomings in care

Encourage clinical colleagues to record all diagnoses and procedures during a healthcare encounter to support accuracy of clinical coding

Recognise that codes and clinical terminologies support the transfer and exchange of information

Promote the need for continuous analysis and sharing of clinical information from the point of care in order to continually improve both the quality of data and the quality of healthcare

8.2 Standards

Objectives:

- *Recognise the difference between technical and clinical data standards, the role of standards in supporting information flows and how standards are established and monitored*

Knowledge

Be aware of the range of technical and clinical standards for information needed to support the creation of interoperable systems in the NHS

Be aware that different interpretations of standards and introduction of non-standard extensions by suppliers can introduce the risk of misinterpretation, reduce compatibility and hinder portability

Be aware of UK and International standards organisations which influence eHealth, such as:

- WHO (World Health Organisation)
- ISO (International Organisation for Standardisation) ⁶⁸
- HL7 (Health Level 7) ⁶⁹
- DICOM (Digital Imaging and Communications in Medicine) ⁷⁰
- NHS England Information Standards Board ⁷¹

Understand standards development processes, the time taken to agree a standard and how well standards are adopted by the market

Be aware that there is a lifecycle for technical standards with variations between versions, families of related standards and sometimes competing standards

Be aware that general uptake of technical specifications can create de-facto standards without formal recognition

Understand the role of standards in systems integration including standards for structuring clinical information (free text, headings, datasets, classifications, coding and terminologies) and technical standards for transmitting information (message structures, protocols, security)

Be aware of the benefits, limitations and risks of specifying different standards for systems integration in terms of market adoption, interoperability, longevity, complexity and performance

Understand how standards can improve clinical system usability and reduce risk e.g. Common User Interface standard ⁷²

Be aware of sources of information on nationally approved standards ^{73 74}

Skills

Facilitate meaningful discussions between clinical and technical experts in health data and information to ensure that clinical records can be appropriately created, stored, aggregated and retrieved throughout the NHS

Maintain up to date knowledge of developments in the eHealth standards domain and sources of nationally approved standards

Behaviours

Recognise the issues and problems of clinical information collection to support patient care, and management information to facilitate organisational objectives and demonstration of good patient outcomes

Recognise that standards support patient centred records that are coherent across organisational boundaries and available to patients and carers appropriately at all times

Recognise and promote the use of standards-based eHealth solutions

Recognise when simple standards are sufficient and where a more complex approach is appropriate

Recognise the need to allow appropriate innovation without allowing significant ambiguity or unfamiliarity to result in adverse patient risk



GLOSSARY OF TERMS

Access to Health Records Act 1990	Rights of access to deceased patient health records by specified persons under limited circumstances
Agile project management	Iterative method of determining requirements for software, and delivering projects, in a highly flexible and interactive manner
Anonymised	Information from which individuals cannot be reasonably identified. This includes names, addresses, full postcodes or identification numbers, alone or in conjunction with any other information held by or available to the recipient, which can be used to identify patients
Authentication	Verification of a person's identity and clinical credentials
Benchmarking	Comparison of own performance against other organisations or best practice
Biometrics	Use of physiological characteristic, such as fingerprint or iris recognition, to verify an individual's identity
Blog	Part of a website where commentary or news is provided on a particular subject
Break glass	Means of providing an individual who does not normally have access privileges to certain types of information with the ability to gain access if necessary
Business continuity	Ensuring that critical business functions are not affected in the event of IT system failure or downtime
Business resilience	Ensuring that critical business functions are not affected in the event of IT system failure or downtime
Caldicott Guardian	Senior staff in the NHS and social care who acts as guardian, responsible for safeguarding the confidentiality of patient information

Caldicott principles	A set of six principles which must be followed when working with person-identifiable information
Change control	Formal process to ensure changes to a system or application are introduced in a controlled and co-ordinated manner
Change methodologies	Recognised tools to support implementation of planned change within an organisation
Clinical reference group	Group of clinicians providing advice to a project or programme of work
Community Health Index (CHI) number	Ten digit number allocated to all patients registered with a GP in NHS Scotland, which acts as the unique patient identifier for healthcare services
Dashboards	Visual display of information captured locally to providing a snapshot of performance
Data anonymisation	Removal of any pieces of information so that the identity of the individual cannot be determined
Data Protection Act 1998	Rights for living individuals to access their own records. The right can also be exercised by an authorised representative on the individual's behalf.
Decision support	Computer software that uses patient data to help clinicians with decision making tasks and diagnoses
Demographics	Information to support positive patient identification, such as name, address, date of birth and NHS number
Demonstrator project	Innovative pilot projects aimed at identifying benefits, risks and challenges of IT projects prior to widespread adoption or implementation
Desktop operating system	Programme and data software on computers that provides common services on which to run other applications

DICOM	Digital Imaging and Communications in Medicine (DICOM) is an internationally recognised standard for handling, storing, printing and transmitting medical images
Disaster recovery	Processes, policies and procedures in place for recovery of data or information in the event of a critical incident relating to systems, applications or technology
DM&D	The NHS Dictionary of Medicines and Devices (DM&D) is a vocabulary dictionary containing unique identifiers and textual descriptions for medicines and medical devices
Early adopter	Groups of individuals or organisations who implement and test new systems or applications before more widespread roll out
eHealth	Combined use of electronic communication and information technology in the health sector to improve the access, efficiency, effectiveness and quality of clinical and business processes utilised by healthcare organisations, healthcare professionals and patients
Electronic Prescription Service	Method of allowing prescribers working in primary care settings in NHS England to generate and transmit electronic prescriptions to dispensers
Equality and Diversity Impact Assessment (EQIA)	A tool to assess the potential impact of policies or functions on disadvantaged and vulnerable groups, whether on the basis of age, disability, gender, race/ethnicity, religion/faith or sexual orientation
Expert patient	People with long term conditions who undertake self management education, which provides them with the tools, techniques and confidence to manage their condition better on a daily basis

Explicit consent	Written or verbal consent is given by an individual for their personal information to be disclosed, such as for research or audit purposes
Freedom of Information Act	Legislation relating to public authority obligation to provide information through an approved publication scheme and in response to requests
OGC Gateway review	The Office of Government and Commerce Gateway review is an independent peer review of projects and programmes to examine progress and provide assurance of likely successful project completion
Health informatics	The knowledge, skills and tools that enable information to be collected, used and shared to support the delivery of healthcare and to promote health and wellbeing
Health literacy	An individual's ability to read, understand and use healthcare information to make decisions and follow instructions for treatment
HL7	Health level 7 is a standard for exchanging messages between healthcare systems and applications
ICD-10	International Statistical Classification of Disease and Related Health Problems (10th edition) is the international standard used to record and code diseases and health-related problems
Information Governance	Describes the principles, processes, legal and ethical responsibilities for managing and handling information
Integrated health record	Provides users with patient centred virtual record through connectivity to information held in separate, autonomous databases

Interoperability	Ability of IT systems from different manufacturers and healthcare organisation across IT domains and communities to exchange and correctly interpret information in provision of multiple healthcare episodes of a patient or for other purpose
ISO	International Organisation for Standardisation provides international technical standards
ITIL	Information Technology Infrastructure Library which provides a framework for identifying, planning, delivering and supporting IT services
Local area network (LAN)	Supplies networking capabilities to a group of computers in close proximity to each other such as a hospital
Master Patient Index (MPI)	Database that maintains a unique identifier for every patient registered at a healthcare facility
Medicines reconciliation	The process of identifying the most accurate list of a patient's current medication by using two or more sources of information for verification
Mobile device	Hand held device or computer with a display screen with touch input or a miniature keyboard
OPCS-4	Office of Populations, Censuses and Surveys Classification of Surgical Operations and Procedures (4th revision) is a classification system devised for operations and surgical procedures carried out during an episode of care
PDA	Personal Digital Assistant (PDA) is a mobile device that provides an electronic visual display, virtual keyboard and can provide access to the internet via Wi-Fi wireless network connectivity
PRINCE2	Process based method for effective project management, which is commonly used for healthcare IT projects

Privacy Impact Assessment	Process which helps assess privacy risks to individuals in the collection, use and disclosure of information
Procurement	Acquisition of products or services at the best possible cost using processes intended to promote open and fair competition
Productivity suite	Collection of programmes to provide office functions for the user e.g. word processor, presentation programme, spreadsheet, email client
Project lifecycle	Sequence of activities to accomplish a project's goals or objectives
Pseudonymised	Information from which individuals cannot be identified by the recipient, but which enables information about different patients to be distinguished or to link information about the same patients over time. A "key" might be retained by the person or service which coded the information so that it can be reconnected with the patient
Quality metrics	Use of analytical tools to present information about clinical outcomes, clinical process and resource utilisation to allow benchmarking of performance
Quality and Outcomes Framework	System for the performance management and payment of General Practitioners in relation to meeting quality improvement targets
RFID	Radiofrequency identification is a technology for identification and tracking that uses radio waves to exchange data between an electronic tag attached to an object and a reader
READ codes	Clinical terminology standard used in Primary Care systems in the UK, which provide standardisation of the way information is recorded

ROI	Return on investment (ROI) is the amount of money gained or lost on an investment relative to the amount of money invested
Secondary uses	Uses of information for purposes other than direct clinical care e.g. research, audit, disease surveillance and teaching
Service desk	Central point of contact between service providers and users, commonly used for reporting incidents and for service requests
SLA	Service level agreement is part of a service contract which may include definition of services, problem management, performance measurement and disaster recovery arrangements
Smart card	Card with a computer chip that can hold data with different levels of security, enabling individuals' identities to be authenticated and can provide a mechanism for permitting differential access to authorised users
SNOMED –CT	Systemized Nomenclature of Medicine – Clinical Terms is a comprehensive clinical terminology owned and maintained by the International Health Terminology Standards Development Organisations. It is the NHS preferred clinical terminology
Stakeholder	Person, group or organisation with an interest in a project
Subject access request	Allows an individual to request a copy of any personal information held on them by public authorities
System patch	Mechanism of fixing faults in applications and vulnerabilities in security or adding new functions
System upgrade	Replacement of hardware or software with a newer or more improved version

Tablet	Personal mobile computer usually operated by touch screen or digital pen
Telecare	Remote or enhanced delivery of care services to people in their own home or community setting by means of telecommunications and computerised services
Telehealth	Provision of health services at a distance using a range of digital technologies
Telehealthcare	Convergence of telehealth and telecare to provide a technology enabled and integrated approach to the delivery of effective, high quality health and care services
Waterfall project management	Sequential process of analysis of requirements, design, production and implementation, with detailed definition of project schedule and emphasis on minimisation of change during project lifecycle
Web conferencing	Combines phone conferencing with the ability to share desktops to discuss documents and presentations
Wide area network (WAN)	Computer network that covers a broad geographical area
Wiki	Website that allows the creation and editing of interlinked web pages via a web browser e.g. community websites, knowledge management systems

ANNEX A

COMPETENCY FRAMEWORKS

Common Competences Framework for Doctors

Academy of Medical Royal Colleges

<http://www.aomrc.org.uk/curriculum-and-framework/frameworks.html>

Health Informatics Career Framework

NHS Wales Informatics Service and NHS Connecting for Health

<http://www.hicf.org.uk>

UK Council for Health Informatics (UK CHIP) standards for health

informaticians

www.ukchip.org

Learning to Manage Health Information: a theme for clinical education

NHS Connecting for Health, 2009

<http://www.connectingforhealth.nhs.uk/systemsandservices/capability/health/hidcurriculum>

Medical Leadership Competency Framework

Academy of Medical Royal Colleges and NHS Institute for Innovation and Improvement

http://www.institute.nhs.uk/assessment_tool/general/medical_leadership_competency_framework_-_homepage.html

Information Governance in NHS Scotland:

A Competency Framework (2011)

NHS Education for Scotland and NHS National Services Scotland

<http://www.nes.scot.nhs.uk/about-nes/publications/information-governance-in-nhsscotlanda-competency-framework>

Health and Social Care Professionals: Telehealthcare Competency Framework

Scottish Centre for Telehealth, NHS24 and Telecare Development Programme 2011

<http://www.jitscotland.org.uk/action-areas/telecare-in-scotland/>

<http://www.knowledge.scot.nhs.uk/telehealthcare.aspx>



BIBLIOGRPAHY

1. The Academy of Medical Royal Colleges and the NHS Institute for Innovation: Medical Leadership Framework
http://www.institute.nhs.uk/assessment_tool/general/medical_leadership_competency_framework_-_homepage.html
2. NHS Information Centre
<http://www.ic.nhs.uk>
3. National Services Scotland: Information Services Division
<http://www.isdscotland.org/isd/1.html>
4. Dr Foster Intelligence
<http://www.drfoosterintelligence.co.uk>
5. Care Quality Commission
<http://www.cqc.org.uk/aboutcqc.cfm>
6. Monitor
<http://www.monitor-nhsft.gov.uk/home/about-monitor>
7. Healthcare Improvement Scotland
http://www.nhshealthquality.org/nhsqis/CCC_FirstPage.jsp
8. Healthcare Inspectorate Wales
<http://www.hiw.org.uk>
9. The Regulation and Quality Improvement Authority
<http://www.rqia.org.uk/home/index.cfm>
10. Department of Health
<http://www.dh.gov.uk/en/index.htm>
11. Scottish Government Health and Social Care Directorate
<http://www.scotland.gov.uk/Topics/Health>
12. Welsh Assembly Health and Social Care
<http://wales.gov.uk/topics/health/?lang=en>
13. Department of Health, Social Services and Public Safety
http://www.dhsspsni.gov.uk/index/about_dept.htm
14. Connecting for Health
<http://www.connectingforhealth.nhs.uk>

15. Scottish Government eHealth Directorate
<http://www.ehealth.scot.nhs.uk>
16. NHS Wales Informatics Service
<http://www.wales.nhs.uk/ihc>
17. Department of Health, Social Services and Public Safety
<http://www.dhsspsni.gov.uk>
18. PRINCE2
<http://www.prince2.com>
19. Managing Successful Programmes
<http://www.msp-officialsite.com>
20. OGC Gateway review
http://www.ogc.gov.uk/what_is_ogc_gateway_review.asp
21. Privacy Impact Assessment
http://www.ico.gov.uk/for_organisations/data_protection/topic_guides/privacy_impact_assessment.aspx
22. Equality and Diversity Impact Assessment: England
http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_090396
23. Equality and Diversity Impact Assessment: Scotland
<http://www.scotland.gov.uk/Publications/2005/02/20687/52424>
24. Equality and Diversity Impact Assessment: Wales
<http://www.equalityhumanrights.com/wales/equality-impact-assessments>
25. Equality and Diversity Impact Assessment: Northern Ireland
http://www.equalityni.org/sections/default.asp?cms=policy_Section+75+-+the+statutory+duties_screening+and+EQIAs&cmsid=89_98_100&id=100&secid=6
26. European Union procurement directives
http://www.ogc.gov.uk/procurement_policy_and_practice_procurement_policy_and_application_of_eu_rules.asp
27. Official Journal of the European Union (OJEU)
<http://www.ojeu.eu>

28. European Computer Driving Licence: NHS Health Module. Connecting for Health, 2007
<http://www.connectingforhealth.nhs.uk/systemsandservices/etd/eits/access/nhshealthsyllabus.pdf>
29. Information Technology Infrastructure Library
<http://www.ital-officialsite.com>
30. Data Protection Act 1998
http://www.ico.gov.uk/for_organisations/data_protection.aspx
31. Access to Health Records Act 1990
<http://www.legislation.gov.uk/ukpga/1990/23/contents>
32. General Medical Council
http://www.gmc-uk.org/guidance/ethical_guidance/consent_guidance_index.asp
33. Department of Health: Reference guide to consent for examination or treatment, second edition 2009
http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_103643
34. General Medical Council
http://www.gmc-uk.org/guidance/ethical_guidance/confidentiality.asp
35. British Medical Association
<http://www.bma.org.uk/ethics/index.jsp>
36. NHS Scotland Code of Practice on Protecting Patient Confidentiality (2003)
<http://www.knowledge.scot.nhs.uk/media/CLT/ResourceUploads/1004569/NHS%20Code%20of%20Practice%20on%20Protecting%20Patient%20Confidentiality.pdf>
37. NHS Code of Practice on Protecting Patient Confidentiality
http://www.dh.gov.uk/en/Managingyourorganisation/Informationpolicy/Patientconfidentialityandcaldicottguardians/DH_4100550
38. Information Commissioner's Office
<http://www.ico.gov.uk>
39. NHS England: Connecting for Health Information Governance guidance
<http://www.connectingforhealth.nhs.uk/systemsandservices/infogov>

40. NHS Scotland: Information Governance Competency Framework
<http://www.nes.scot.nhs.uk/about-nes/publications/information-governance-in-nhsscotlanda-competency-framework>
41. NHS Wales: Informing Healthcare Information Governance guidance
<http://www.wales.nhs.uk/nwis/page/52618>
42. Information Commissioner's Office 2002:
Use and disclosure of health data
http://www.ico.gov.uk/for_organisations/sector_guides/health.aspx
43. Data breach management
http://www.ico.gov.uk/~/media/documents/library/Data_Protection/Practical_application/GUIDANCE_ON_DATA_SECURITY_BREACH_MANAGEMENT.ashx
44. Data breach reporting
http://www.ico.gov.uk/~/media/documents/library/Data_Protection/Practical_application/BREACH_REPORTING.ashx
45. Information Commissioner's Office - data sharing code of practice
http://www.ico.gov.uk/for_organisations/data_protection/topic_guides/data_sharing.aspx
46. Caldicott Guardians: England
http://www.dh.gov.uk/en/Managingyourorganisation/Informationpolicy/Patientconfidentialityandcaldicottguardians/DH_4100563
47. Caldicott Guardians: Scotland
<http://www.knowledge.scot.nhs.uk/caldicottguardians.aspx>
48. Caldicott Guardians: Wales
<http://www.wales.nhs.uk/nwis/page/52658>
49. Freedom of Information Act: England, Wales and Northern Ireland
http://www.ico.gov.uk/for_organisations/freedom_of_information.aspx
50. Freedom of Information Act: Scotland
<http://www.itspublicknowledge.info/homeScottishInformationCommissioner.asp>
51. Records management: NHS code of practice (Parts 1 and 2)
http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4131747

52. Records Management: NHS Code of Practice (Scotland) Version 2.0:
<http://www.scotland.gov.uk/Publications/2010/04/20142935/0>
53. Record keeping standards
<http://www.rcplondon.ac.uk/resources/clinical-resources/standards-medical-record-keeping>
54. NHS Choices
<http://www.nhs.uk/Pages/HomePage.aspx>
55. NHS Inform
<http://www.nhsinform.co.uk>
56. NHS Direct Wales
<http://www.nhsdirect.wales.nhs.uk>
57. Health and Social Care in Northern Ireland
<http://www.hscni.net/>
58. Access to records
http://www.bma.org.uk/images/accesstohealthrecordsdecember2008_tcm41-183583.pdf
59. Subject access requests
http://www.ico.gov.uk/for_organisations/sector_guides/health.aspx
60. Health Rights Information Scotland
<http://www.hris.org.uk>
61. Quality and Outcomes Framework
<http://www.nhsemployers.org/PayAndContracts/GeneralMedicalServicesContract/QOF/Pages/QualityOutcomesFramework.aspx>
62. NHS Dictionary of Medicines and Devices (DM&D)
<http://www.dmd.nhs.uk>
63. Radiofrequency Identification guidelines
http://www.ico.gov.uk/~media/documents/library/Data_Protection/Detailed_specialist_guides/RADIO_FREQUENCY_IDENTIFICATION_TECH_GUIDANCE.ashx
64. READ version 3
<http://www.connectingforhealth.nhs.uk/systemsandservices/data/uktc/readcodes>

65. Systemised Nomenclature of Medicine Clinical Terms (SNOMED –CT)
<http://www.connectingforhealth.nhs.uk/systemsandservices/data/uktc/snomed>
66. International Statistical Classification of Disease and Related Health Problems (10th edition)
<http://www.who.int/classifications/icd/en>
67. Office of Populations, Censuses and Surveys Classification of Surgical Operations and Procedures (4th revision)
<http://www.connectingforhealth.nhs.uk/systemsandservices/data/clinicalcoding/codingstandards/opcs4>
68. International Organisation for Standardisation (ISO)
<http://www.iso.org/iso/home.html>
69. Health level 7 (HL7v 3)
<http://www.hl7.org.uk>
70. Digital Imaging and Communications in Medicine (DICOM)
<http://medical.nema.org>
71. Information standards board for health and social care
<http://www.isb.nhs.uk>
72. NHS Common User Interface
<http://www.cui.nhs.uk/Pages/NHSCommonUserInterface.aspx>
73. Data standards
<http://www.connectingforhealth.nhs.uk/systemsandservices/data>
NHS Scotland eHealth standards library http://www.ehealth.scot.nhs.uk/?page_id=372

DISCLAIMER

This competency framework has been written for the use of medical and dental professionals in the UK. The competences described in this document may also be of relevance to other healthcare professionals, however these groups do not fall under the governance of the Academy of Medical Royal Colleges.

Members of the general public are at liberty to read the framework but this is not the intended audience and no additional explanations of terminology are offered.

All references and hyperlinks to additional sources of information are correct at the time of going to press.

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- Information Commissioner's Office
- Joint Royal Colleges of Physicians Training Board (JRCPTB)
- Medical Directors of Strategic Health Authorities of England
- National Education for Scotland
- NHS Employers
- NHS Northern Ireland Chief Medical Officer
- NHS Northern Ireland Belfast Health and Social Care Trust
- NHS Northern Ireland Northern Health and Social Care Trust
- NHS Northern Ireland Southern Health and Social Care Trust
- NHS Northern Ireland South Eastern Health and Social Care Trust
- NHS Northern Ireland Western Health and Social Care Trust
- NHS Scotland Chief Medical Officer
- NHS Scotland Chief Nursing Officer
- NHS Scotland Clinical Change Leadership Group
- NHS Scotland eHealth Leads
- NHS Wales Abertawe Bro Morgannwg Health Board
- NHS Wales Aneurin Bevan Health Board
- NHS Wales Betsi Cadwaladr University Health Board
- NHS Wales Cardiff and Vale University Health Board
- NHS Wales Cwm Taf Health Board
- NHS Wales Hywel Dda Health Board

- NHS Wales Powys Teaching Health Board
- NHS Wales Informatics Service
- NHS Wales Medical Directors
- Northern Ireland Health and Social Care Board
- Northern Ireland Medical and Dental Training Agency
- Queen's University, Belfast
- Royal College of Anaesthetists
- Royal College of General Practitioners
- Royal College of Obstetrics and Gynaecology
- Royal College of Ophthalmologists
- Royal College of Nursing
- Royal College of Paediatrics and Child Health
- Royal College of Pathologists
- Royal College of Physicians of Edinburgh
- Royal College of Physicians of London
- Royal College of Physicians and Surgeons of Glasgow
- Royal College of Psychiatrists
- Royal College of Radiologists
- Royal College of Surgeons of Edinburgh
- Royal College of Surgeons of England
- Scottish Association of Medical Directors
- Scottish Centre for Telehealth
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- UK Council for Health Informatics Professions
- UK Faculty of Health Informatics
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