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Clinical Risk Management: its Application in the Manufacture of Health IT Systems - Specification

Document Management

Revision History

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4.1	16.08.2016	NHS Digital Rebranded

Reviewers

This document must be reviewed by the following people:

Reviewer name	Title / Responsibility	Date	Version
	NHS Digital Clinical Safety Group	16.08.2016	4.1
Deborah Raven	Information Standards Management Services	17.01.2013	1.0

Approved by

This document must be approved by the following people:

Name	Title	Date	Version
Dr Sebastian Alexander	Interim Clinical Director for Patient Safety	16.08.2016	4.1
Debbie Chinn	Director of Solution Assurance	16.08.2016	4.1



This information standard (SCCI0129) has been approved for publication by NHS England under [section 250 of the Health and Social Care Act 2012](#).

Assurance that this information standard meets the requirements of the Act and is appropriate for the use specified in the specification document has been provided by the Standardisation Committee for Care Information (SCCI), a sub-group of the National Information Board.

This information standard comprises the following documents:

- Specification
- Implementation Guidance.

An Information Standards Notice (SCCI0129 Amd 39/2012) has been issued as a notification of use. Please read this alongside the documents for the standard.

The controlled versions of these documents can be found on the [SCCI webpages](#).

Date of publication: 5 May 2016 (documents updated 16 August 2016 to reflect the adoption of NHS Digital as the preferred name of the Health and Social Care Information Centre).



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Related Documents:

These documents provide additional information and are specifically referenced within this document.

Ref	Doc Reference Number	Title	Version
1.	ISB 0160 (DSCN 18/2009)	Guidance on the management of clinical risk relating to the Deployment and Use of Health Software: www.isb.nhs.uk/library/standard/162	2009
2.	SCCI0160 Amd 38/2012	Clinical Risk Management: its Application in the Deployment and Use of Health IT Systems: www.digital.nhs.uk/isce/publication/scci0160	4.1
3.	ISB 0129 (DSCN 14/2009)	Application of Patient Safety Risk Management to the Manufacture of Health Software: www.isb.nhs.uk/library/standard/163	2009
4.	SCCI0129 Amd 39/2012	Clinical Risk Management: its Application in the Manufacture of Health IT Systems: www.digital.nhs.uk/isce/publication/scci0129	3.1
5.	2007/47/EC	Medical Device Regulations (amendment 2010)	
6.	ISO 14971:2009	Medical Devices: Application of Risk Management to Medical Devices	2009
7.		ALARP (HSE Website)	
8.		2006 Annual Report of the Chief Medical Officer On the State of Public Health, Department of Health	2006
9.	0555	Healthcare risk assessment made easy, NPSA	2007
10.	NPFIT-FNT-TO-TOCLNSA-1170	DSCN 14/2009 and DSCN 18/2009 Implementation Review	2012
11.		Managing competence for safety-related systems, HSE	2007
12.		The power of information: Putting all of us in control of the health and care information we need, May 2012: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/213689/dh_134205.pdf	
13.	RFC-2119	Key words for use in RFCs to Indicate Requirement Levels, 1997	

Glossary of Terms:

Term	Definition
Clinical Safety Officer (previously referred to as Responsible Person)	Person in a Manufacturer's organisation responsible for ensuring the safety of a Health IT System in that organisation through the application of clinical risk management.
Clinical risk	Combination of the severity of harm to a patient and the likelihood of occurrence of that harm.
Clinical risk analysis	Systematic use of available information to identify and estimate a risk.
Clinical risk control	Process in which decisions are made and measures implemented by which clinical risks are reduced to, or maintained within, specified levels.
Clinical risk estimation	Process used to assign values to the severity of harm to a patient and the likelihood of occurrence of that harm.
Clinical risk evaluation	Process of comparing a clinical risk against given risk criteria to determine the acceptability of the clinical risk.
Clinical risk management	Systematic application of management policies, procedures and practices to the tasks of analysing, evaluating and controlling clinical risk.
Clinical Risk Management File	Repository of all records and other documents that are produced by the clinical risk management process.
Clinical Risk Management Plan	A plan which documents how the Manufacturer will conduct clinical risk management of a Health IT System.
Clinical Risk Management Process	A set of interrelated or interacting activities, defined by the Manufacturer, to meet the requirements of this standard with the objective of ensuring clinical safety in respect to the development and modification of a Health IT System.
Clinical safety	Freedom from unacceptable clinical risk to patients.
Clinical Safety Case	Accumulation and organisation of product and business process documentation and supporting evidence, through the lifecycle of a Health IT System.
Clinical Safety Case Report	A report that presents the arguments and supporting evidence that provides a compelling, comprehensible and valid case that a system is safe for a given application in a given environment at a defined point in a Health IT System's lifecycle.
Harm	Death, physical injury, psychological trauma and/or damage to the health or well-being of a patient.
Hazard	Potential source of harm to a patient.
Hazard Log	A mechanism for recording and communicating the on-going identification and resolution of hazards associated with a Health IT System.
Health Organisation	Organisation within which a Health IT System is deployed or used for a healthcare purpose.
Health IT System	Product used to provide electronic information for health or social care purposes. The product may be hardware, software or a combination.

Initial clinical risk	The clinical risk derived during clinical risk estimation taking into consideration any retained risk control measures.
Intended use	Use of a product, process or service in accordance with the specifications, instructions and information provided by the manufacturer to customers.
Issue	The process associated with the authoring of a document. This process will include: reviewing, approval and configuration control.
Likelihood	Measure of the occurrence of harm.
Lifecycle	All phases in the life of a Health IT System, from the initial conception to final decommissioning and disposal.
Manufacturer	Person or organisation with responsibility for the design, manufacture, packaging or labelling of a Health IT System, assembling a system, or adapting a Health IT System before it is placed on the market and/or put into service, regardless of whether these operations are carried out by that person or on that person's behalf by a third party.
Patient	A person who is the recipient of healthcare.
Patient safety	Freedom from harm to the patient.
Post-deployment	That part of the lifecycle of a Health IT System after it has been manufactured, released, deployed and is ready for use by the Health Organisation.
Procedure	Specified way to carry out an activity or a process.
Process	Set of interrelated or interacting activities which transform inputs into outputs.
Release	A specific configuration of a Health IT System delivered to a Health Organisation by the Manufacturer as a result of the introduction of new or modified functionality.
Residual clinical risk	Clinical risk remaining after the application of risk control measures.
Safety incident	Any unintended or unexpected incident which could have, or did, lead to harm for one or more patients receiving healthcare.
Safety Incident Management Log	Tool to record the reporting, management and resolution of safety incidents associated with a Health IT System.
Severity	Measure of the possible consequences of a hazard.
Third party product	A product that is produced by another organisation and not by the Health IT System manufacturer. Examples include operating systems, library code, database and application servers and network components.
Top Management	Person or group of people who direct(s) and control(s) an organisation and has overall accountability for a Health IT System.

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1 Overview

1.1 Summary

It is widely accepted that the provision and deployment of Health IT Systems within the National Health Service (NHS) can deliver substantial benefits to NHS patients through the timely provision of complete and correct information to those healthcare professionals that are responsible for administering care.

The use of such Health IT Systems is becoming increasingly widespread and the functionality is becoming more sophisticated. However, it must be recognised that failure or incorrect use of such systems have the potential to cause harm to those patients that the system is intended to benefit.

In his 2006 annual report [Ref. 8], the Chief Medical Officer specifically directed the NHS to utilise best practice techniques from high technology:

“I also recommended that the NHS look to high-risk industries for examples of effective safety practices and compare them with its own. I was pleased to hear that several safety techniques developed in high-risk settings are being implemented in the NHS”.

The importance of patient safety in the delivery of IT solutions is further emphasised in the 2012 Information Strategy [Ref. 1].

The purpose of this standard is to promote and ensure that effective clinical risk management is carried out by organisations that are responsible for developing and modifying Health IT Systems. This purpose is achieved through the presentation of a set of requirements.

Within this standard the term ‘clinical risk’ is used to emphasise that the scope is limited to the management of risks related to patient safety as distinct from other types of risk such as financial.

Clinical risk management may be conducted within the context of an overall risk management system operated by the Manufacturer and any wider health information governance processes. Wherever practical, existing risk management processes would be adapted and used to address the requirements of this standard.

The extent of clinical risk management needs only to be commensurate with the scale, complexity and level of clinical risk associated with the deployment. The Manufacturer’s clinical risk management processes should be flexible to facilitate this.

This standard is supported by implementation guidance [Ref. 4] which contains an explanatory narrative which will aid in the interpretation and application of this standard.

This standard complements SCCI0160 [Ref. 2].

This standard is addressed to Manufacturer personnel who are responsible for ensuring clinical safety in the development and modification of Health IT Systems through the application of clinical risk management.

This standard applies to Health IT Systems that are not controlled by medical device regulations [Ref. 5], though the requirements defined in this standard are broadly consistent with the requirements of ISO 14971 [Ref. 6].

2 General Requirements and Conformance Criteria for Clinical Risk Management

The following requirements use either MUST or SHOULD as defined by [RFC-2119](#) [Ref. 13], where:

- MUST: “means that the definition is an absolute requirement of the specification”
- SHOULD: “means that there may exist valid reasons in particular circumstances to ignore a particular item, but the full implications must be understood and carefully weighed before choosing a different course”.

In order to claim conformance with this Specification, a Manufacturer MUST implement the clinical risk analysis activities defined in sections 2 to 7, within the bounds of the definitions above.

2.1 Clinical Risk Management Process

2.1.1	<p>The Manufacturer MUST define and document a clinical risk management process which recognises the risk management activities shown in Figure 1.</p> <p><i>Note: the numbers shown in parentheses in this figure refer to sections later in this document.</i></p>
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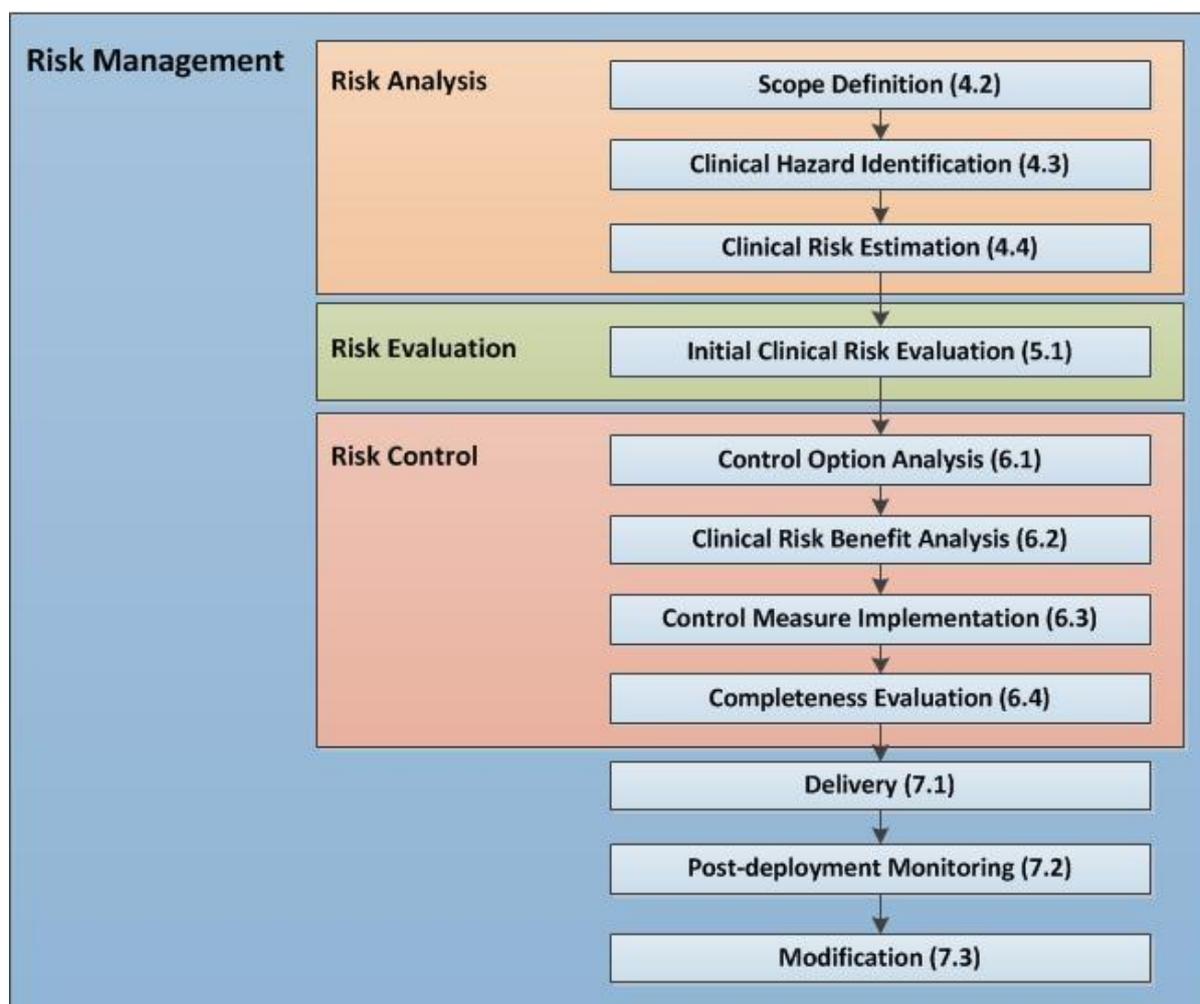


Figure 1 Clinical Risk Management Process

2.2 Top Management responsibilities

2.2.1	<p>In implementing the clinical risk management process for a given deployment, Top Management MUST:</p> <ul style="list-style-type: none"> • make available sufficient resources • assign competent personnel (see section 2.4) from each of the specialist areas that are involved in developing and assuring the Health IT System • nominate a Clinical Safety Officer.
2.2.2	<p>Top Management MUST ensure that appropriate levels of authorisation for the Health IT System and its safety documentation are defined in the Clinical Risk Management Plan.</p>

2.3 Clinical Safety Officer

2.3.1	<p>A Clinical Safety Officer MUST be a suitably qualified and experienced clinician.</p>
2.3.2	<p>A Clinical Safety Officer MUST hold a current registration with an appropriate professional body relevant to their training and experience.</p>
2.3.3	<p>A Clinical Safety Officer MUST be knowledgeable in risk management and its application to clinical domains.</p>
2.3.4	<p>A Clinical Safety Officer MUST make sure that the processes defined by the clinical risk management process are followed.</p>

2.4 Competencies of personnel

2.4.1	<p>Personnel MUST have the knowledge, experience and competencies appropriate to undertaking the clinical risk management tasks assigned to them.</p>
2.4.2	<p>Competency and experience records for the personnel involved in performing the clinical risk tasks MUST be maintained.</p>

2.5 Third party products

2.5.1	<p>The Manufacturer MUST assess any third party product that is included within a release as part of the clinical risk management process.</p>
2.5.2	<p>The nature of this assessment MUST be included in Clinical Safety Case Reports.</p>

2.6 Regular clinical risk management process review

2.6.1	<p>The Manufacturer MUST formally review its clinical risk management process at planned, regular intervals.</p>
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3 Project Safety Documentation and Repositories

This section defines the safety documents that are to be produced in support of the development and modification of a Health IT System and mechanisms for their retention.

3.1 Clinical Risk Management File

3.1.1	The Manufacturer MUST establish at the start of a project a Clinical Risk Management File for the Health IT System.
3.1.2	The Clinical Risk Management File MUST be maintained for the life of the Health IT System.
3.1.3	All formal documents and evidence of compliance with the requirements of this standard MUST be recorded in the Clinical Risk Management File.
3.1.4	Any decisions made that influence the clinical risk management activities undertaken MUST be recorded in the Clinical Risk Management File.

3.2 Clinical Risk Management Plan

3.2.1	The Manufacturer MUST produce at the start of a project a Clinical Risk Management Plan, which will include risk acceptability criteria, for the Health IT System.
3.2.2	A Clinical Safety Officer MUST approve the Clinical Risk Management Plan.
3.2.3	If the nature of the project changes, or key people change, during the development or modification of a Health IT System, then the Clinical Risk Management Plan MUST be updated.
3.2.4	The Clinical Risk Management Plan MUST be maintained throughout the life of the Health IT System.

3.3 Hazard Log

3.3.1	The Manufacturer MUST establish and maintain a Hazard Log.
3.3.2	A Clinical Safety Officer MUST approve each version of the Hazard Log.
3.3.3	An issued Hazard Log MUST accompany each Clinical Safety Case Report.

3.4 Clinical Safety Case

3.4.1	The Manufacturer MUST develop and maintain a Clinical Safety Case for the Health IT System.
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3.5 Clinical Safety Case Reports

3.5.1	The Manufacturer MUST produce a Clinical Safety Case Report at each lifecycle phase defined in the Clinical Risk Management Plan.
3.5.2	A Clinical Safety Officer MUST approve each Clinical Safety Case Report.
3.5.3	The Manufacturer MUST make available each Clinical Safety Case Report to a receiving organisation, which may be a Health Organisation or another Manufacturer.

3.6 Safety Incident Management Log

3.6.1	The Manufacturer MUST maintain a Safety Incident Management Log.
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4 Clinical risk analysis

4.1 Clinical risk analysis process

4.1.1	The Manufacturer MUST implement the clinical risk analysis activities defined in the Clinical Risk Management Plan.
4.1.2	Clinical risk analysis SHOULD be carried out by a multi-disciplinary group including a Clinical Safety Officer.
4.1.3	The extent of clinical risk analysis MUST be commensurate with the scale, complexity and level of clinical risk associated with the Release.

4.2 Health IT System scope definition

4.2.1	The Manufacturer MUST define the clinical scope of the Health IT System which is to be delivered.
4.2.2	The Manufacturer MUST define the intended use of the Health IT System which is to be delivered.

4.3 Identification of hazards to patients

4.3.1	The Manufacturer MUST identify and document known and foreseeable hazards to patients with respect to the intended use of the Health IT System in both normal and fault conditions.
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4.4 Estimation of the clinical risks

4.4.1	<p>For each identified hazard the Manufacturer MUST estimate, using the criteria specified in the Clinical Risk Management Plan:</p> <ul style="list-style-type: none"> • the severity of the hazard • the likelihood of the hazard • the resulting clinical risk.
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5 Clinical risk evaluation

5.1 Initial clinical risk evaluation

5.1.1	For each identified hazard, the Manufacturer MUST evaluate whether the initial clinical risk is acceptable. This evaluation MUST use the risk acceptability criteria defined in the Clinical Risk Management Plan.
5.1.2	If the initial clinical risk is acceptable, then the risk control requirements defined in sections 6.1 to 6.3 do not apply to this hazard.

6 Clinical risk control

6.1 Clinical risk control option analysis

6.1.1	The Manufacturer MUST identify appropriate clinical risk control measures to remove any unacceptable clinical risk.
6.1.2	Proposed clinical risk control measures MUST be assessed by the Manufacturer to determine whether: <ul style="list-style-type: none"> • new hazards will be introduced as a result of the measures • the clinical risks for previously identified hazards will be affected.
6.1.3	The Manufacturer MUST manage any new hazards or increased clinical risks in accordance with sections 4.4 to 6.4.
6.1.4	The Manufacturer MUST evaluate the residual clinical risk. This evaluation MUST use the risk acceptability criteria defined in the Clinical Risk Management Plan.
6.1.5	Where a residual clinical risk is judged unacceptable, the Manufacturer MUST identify additional clinical risk control measures in order to reduce the clinical risk.
6.1.6	If the Manufacturer determines that no suitable risk control measures are possible then the Manufacturer MUST conduct a clinical risk benefit analysis of the clinical risk (section 6.2).

6.2 Clinical risk benefit analysis

6.2.1	Where a residual clinical risk is deemed unacceptable and further clinical risk control is not practicable, the Manufacturer MUST determine if the clinical benefits of the intended use outweigh the residual clinical risk.
6.2.2	If the clinical benefits do not outweigh the residual clinical risk, then the clinical risk remains unacceptable and the project SHOULD be re-appraised.

6.3 Implementation of clinical risk control measures

6.3.1	The Manufacturer MUST implement the clinical risk control measures identified in section 6.1.1, except where these are to be implemented by another organisation.
6.3.2	The Manufacturer MUST verify each clinical risk control measure implemented under 6.3.1.
6.3.3	The Manufacturer MUST verify the effectiveness of each clinical risk control measure implemented under 6.3.1.

6.4 Completeness of clinical risk control

6.4.1	The Manufacturer MUST ensure that the clinical risks from all identified hazards have been considered and accepted.
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7 Delivery, Monitoring and Modification

7.1 Delivery

7.1.1	The Manufacturer MUST undertake a formal review of the Health IT System, prior to its delivery, to ensure that all of the requirements of this standard have been addressed.
7.1.2	The results of this review MUST be recorded in the Clinical Safety Case Report.
7.1.3	The Health IT System configuration for the release MUST be recorded in the Clinical Safety Case Report.

7.2 Post-deployment monitoring

7.2.1	The Manufacturer MUST establish, document and maintain a process to collect and review reported safety concerns and safety incidents for the Health IT System following its deployment.
7.2.2	The Manufacturer MUST assess the impact of any such information on the on-going validity of the Clinical Safety Case.
7.2.3	Where any such evidence is assessed to undermine the safety case the Manufacturer MUST take appropriate corrective action in accordance with the Clinical Risk Management Plan and document it in the Clinical Safety Case Report.
7.2.4	The Manufacturer MUST ensure safety related incidents are reported and resolved in a timely manner.
7.2.5	A record of safety incidents, including their resolution, MUST be maintained by the Manufacturer in a Safety Incident Management Log.

7.3 Modification

7.3.1	The Manufacturer MUST apply their clinical risk management process to any modifications or updates of the deployed Health IT System.
7.3.2	The application of this process MUST be commensurate with the scale and extent of the change and the introduction of any new clinical risks.
7.3.3	The Manufacturer MUST issue a Clinical Safety Case Report to support any modification to the Health IT System that changes its clinical risk.
7.3.4	The Manufacturer MUST maintain an audit trail of all versions and patches released for deployment.