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## Health informatics — Information security management in health using ISO/IEC 27002

*Informatique de santé — Gestion de la sécurité de l'information relative  
à la santé en utilisant l'ISO/CEI 27002*



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## Contents

Page

Foreword.....	iv
Introduction .....	v
<b>1 Scope .....</b>	<b>1</b>
<b>1.1 General.....</b>	<b>1</b>
<b>1.2 Scope exclusions.....</b>	<b>1</b>
<b>2 Normative references .....</b>	<b>2</b>
<b>3 Terms and definitions.....</b>	<b>2</b>
<b>3.1 Health terms .....</b>	<b>2</b>
<b>3.2 Information security terms .....</b>	<b>3</b>
<b>4 Abbreviated terms .....</b>	<b>5</b>
<b>5 Health information security .....</b>	<b>5</b>
<b>5.1 Health information security goals.....</b>	<b>5</b>
<b>5.2 Information security within information governance.....</b>	<b>6</b>
<b>5.3 Information governance within corporate and clinical governance.....</b>	<b>7</b>
<b>5.4 Health information to be protected .....</b>	<b>7</b>
<b>5.5 Threats and vulnerabilities in health information security .....</b>	<b>8</b>
<b>6 Practical action plan for implementing ISO/IEC 27002 .....</b>	<b>8</b>
<b>6.1 Taxonomy of the ISO/IEC 27002 and ISO/IEC 27001 standards.....</b>	<b>8</b>
<b>6.2 Management commitment to implementing ISO/IEC 27002 .....</b>	<b>9</b>
<b>6.3 Establishing, operating, maintaining and improving the ISMS .....</b>	<b>10</b>
<b>6.4 Planning: establishing the ISMS .....</b>	<b>10</b>
<b>6.5 Doing: implementing and operating the ISMS.....</b>	<b>18</b>
<b>6.6 Checking: monitoring and reviewing the ISMS .....</b>	<b>19</b>
<b>6.7 Acting: maintaining and improving the ISMS .....</b>	<b>20</b>
<b>7 Healthcare implications of ISO/IEC 27002.....</b>	<b>20</b>
<b>7.1 General.....</b>	<b>20</b>
<b>7.2 Information security policy.....</b>	<b>21</b>
<b>7.3 Organizing information security .....</b>	<b>22</b>
<b>7.4 Asset management .....</b>	<b>25</b>
<b>7.5 Human resources security.....</b>	<b>26</b>
<b>7.6 Physical and environmental security .....</b>	<b>29</b>
<b>7.7 Communications and operations management .....</b>	<b>30</b>
<b>7.8 Access control .....</b>	<b>36</b>
<b>7.9 Information systems acquisition, development and maintenance.....</b>	<b>39</b>
<b>7.10 Information security incident management.....</b>	<b>41</b>
<b>7.11 Information security aspects of business continuity management.....</b>	<b>42</b>
<b>7.12 Compliance.....</b>	<b>42</b>
<b>Annex A (informative) Threats to health information security .....</b>	<b>45</b>
<b>Annex B (informative) Tasks and related documents of the Information Security Management System .....</b>	<b>50</b>
<b>Annex C (informative) Potential benefits and required attributes of support tools .....</b>	<b>54</b>
<b>Bibliography .....</b>	<b>57</b>

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 27799 was prepared by Technical Committee ISO/TC 215, *Health informatics*.

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## Introduction

This International Standard provides guidance to healthcare organizations and other custodians of personal health information on how best to protect the confidentiality, integrity and availability of such information by implementing ISO/IEC 27002<sup>1)</sup>. Specifically, this International Standard addresses the special information security management needs of the health sector and its unique operating environments. While the protection and security of personal information is important to all individuals, corporations, institutions and governments, there are special requirements in the health sector that need to be met to ensure the confidentiality, integrity, auditability and availability of personal health information. This type of information is regarded by many as being among the most confidential of all types of personal information. Protecting this confidentiality is essential if the privacy of subjects of care is to be maintained. The integrity of health information must be protected to ensure patient safety, and an important component of that protection is ensuring that the information's entire life cycle be fully auditable. The availability of health information is also critical to effective healthcare delivery. Health informatics systems must meet unique demands to remain operational in the face of natural disasters, system failures and denial-of-service attacks. Protecting the confidentiality, integrity and availability of health information therefore requires health-sector-specific expertise.

The need for effective IT security management in healthcare is made all the more urgent by the increasing use of wireless and Internet technologies in healthcare delivery. If not implemented properly, these complex technologies will increase the risks to the confidentiality, integrity and availability of health information. Regardless of size, location and model of service delivery, all healthcare organizations need to have stringent controls in place to protect the health information entrusted to them. Yet many health professionals work as solo health providers or in small clinics that lack the dedicated IT resources to manage information security. Healthcare organizations must therefore have clear, concise and healthcare-specific guidance on the selection and implementation of such controls. This guidance must be adaptable to the wide range of sizes, locations, and models of service delivery found in healthcare. Finally, with increasing electronic exchange of personal health information between health professionals, there is a clear benefit in adopting a common reference for information security management in healthcare.

ISO/IEC 27002 is already being used extensively for health informatics IT security management through the agency of national or regional guidelines in Australia, Canada, France, the Netherlands, New Zealand, South Africa and the United Kingdom. Interest is growing in other countries as well. This International Standard (ISO 27799) draws upon the experience gained in these national endeavours in dealing with the security of personal health information and is intended as a companion document to ISO/IEC 27002. It is not intended to supplant ISO/IEC 27002 or ISO/IEC 27001. Rather, it is a complement to these more generic standards.

This International Standard applies ISO/IEC 27002 to the healthcare domain in a way that carefully considers the appropriate application of security controls for the purposes of protecting personal health information. These considerations have, in some cases, led the authors to conclude that application of certain ISO/IEC 27002 control objectives is essential if personal health information is to be adequately protected. This International Standard therefore places constraints upon the application of certain security controls specified in ISO/IEC 27002. This in turn has led to the inclusion in Clause 7 of several normative statements stating that the application of a given security control is mandatory. For example, 7.2.1 states that

*Organizations processing health information, including personal health information, **shall** have a written information security policy that is approved by management, published, and then communicated to all employees and relevant external parties.*

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1) This guideline is consistent with the revised version of ISO/IEC 27002:2005.

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In the health domain, it is possible for an organization (a hospital, say) to be certified using ISO/IEC 27001 without requiring certification against, or even acknowledgement of, this International Standard. It is to be hoped, however, that as healthcare organizations strive to improve the security of personal health information, conformance with this International Standard, as a stricter standard for healthcare, will also become widespread.

All of the security control objectives described in ISO/IEC 27002 are relevant to health informatics but some controls require additional explanations with regard to how they can be used best to protect the confidentiality, integrity and availability of health information. There are also additional health-sector-specific requirements. This International Standard provides additional guidance in a format that persons responsible for health information security can readily understand and adopt.

This International Standard's authors do not intend to write a primer on computer security, nor to restate what has already been written in ISO/IEC 27002 or in ISO/IEC 27001. There are many security requirements that are common to all computer-related systems, whether used in financial services, manufacturing, industrial control, or indeed in any other organized endeavour. A concerted effort has been made to focus on security requirements necessitated by the unique challenges of delivering electronic health information that supports the provision of care.

### **Who should read this International Standard?**

This International Standard is intended for those responsible for overseeing health information security and for healthcare organizations and other custodians of health information seeking guidance on this topic, together with their security advisors, consultants, auditors, vendors and third-party service providers.

### **Benefits of using this International Standard**

ISO/IEC 27002 is a broad and complex standard and its advice is not tailored specifically to healthcare. This International Standard allows for the implementation of ISO/IEC 27002, within health environments, in a consistent fashion and with particular attention to the unique challenges that the health sector poses. By following it, healthcare organizations help to ensure that the confidentiality and integrity of data in their care are maintained, that critical health information systems remain available, and that accountability for health information is upheld.

The adoption of this guidance by healthcare organizations both within and among jurisdictions will assist interoperability and enable the safe adoption of new collaborative technologies in the delivery of healthcare. Secure and privacy-protective information sharing can significantly improve healthcare outcomes.

As a result of implementing this guidance, healthcare organizations can expect to see the number and severity of their security incidents reduced, allowing resources to be redeployed to productive activities. IT security will thereby allow health resources to be deployed in a cost-effective and productive manner. Indeed, research by the respected Information Security Forum and by market analysts has shown that good all-round security can have as much as a 2 % positive effect upon organizations' results.

Finally, a consistent approach to IT security, understandable by all involved in healthcare, will improve staff morale and increase the trust of the public in the systems that maintain personal health information.

### **How to use this International Standard**

Readers not already familiar with ISO/IEC 27002 are urged to read the introductory sections of that International Standard before continuing. Implementers of this International Standard (ISO/IEC 27799) must first thoroughly read ISO/IEC 27002, as the text below will frequently refer the reader to the relevant sections of that International Standard. The present document cannot be fully understood without access to the full text of ISO/IEC 27002.

General readers not already familiar with health information security and its goals, challenges, and broader context, will benefit from reading a brief introduction, to be found in Clause 5.

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Readers seeking guidance on how to implement ISO/IEC 27002 in a health environment will find a practical action plan described in Clause 6. No mandatory requirements are contained in this clause. Instead, general advice and guidance are given on how best to proceed with the implementation of 27002 in healthcare. The clause is organized around a cycle of activities (plan/do/check/act) that are described in ISO/IEC 27001 and that, when followed, will lead to a robust implementation of an information security management system.

Readers seeking specific advice on the eleven security control clauses and 39 main security control categories described in ISO/IEC 27002 will find it in Clause 7. This clause leads the reader through each of the eleven security control clauses of ISO/IEC 27002. Minimum requirements are stated where appropriate and, in some cases, normative guidelines are set out on the proper application of certain ISO/IEC 27002 security controls to the protection of health information.

This International Standard concludes with three informative annexes. Annex A describes the general threats to health information. Annex B briefly describes tasks and related documents of the information security management system. Annex C discusses the advantages of support tools as an aid to implementation. The Bibliography lists related standards in health information security.