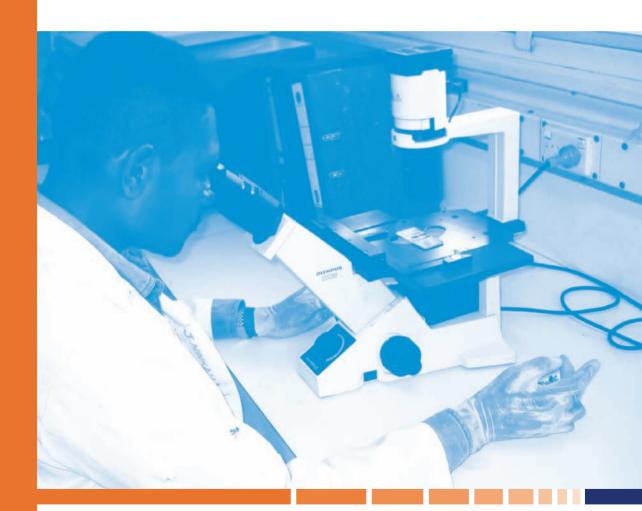
# Laboratory Quality Management System

# **Handbook**











WHO Library Cataloguing-in-Publication Data

Laboratory quality management system: handbook.

I.Laboratories — organization and administration. 2. Laboratories — handbooks. 3.Laboratories techniques and procedures — standards. 4.Quality control. 5.Manuals. I.World Health Organization.

ISBN 978 92 4 154827 4 (NLM classification: QY 25) **Version 1.1** 

### © World Health Organization 2011

All rights reserved. Publications of the World Health Organization are available on the WHO web site (www.who.int) or can be purchased from WHO Press, World Health Organization, 20 Avenue Appia, 1211 Geneva 27, Switzerland (tel.: +41 22 791 3264; fax: +41 22 791 4857; e-mail: bookorders@who.int).

Requests for permission to reproduce or translate WHO publications – whether for sale or for noncommercial distribution – should be addressed to WHO Press through the WHO web site (http://www.who.int/about/licensing/copyright\_form/en/index.html).

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by the World Health Organization to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall the World Health Organization be liable for damages arising from its use.

Printed in France

### **Contacts**

WHO Lyon Office – International Health Regulations Coordination 58 avenue Debourg – 69007 Lyon – France ihrinfo@who.int

CDC – National Center for Preparedness, Detection and Control of Infectious Diseases (NCPDCID)
1600 Clifton Road – Atlanta, GA – USA
QMS\_toolkit@CDC.gov

Clinical and Laboratory Standards Institute 940 West Valley Road, Suite 1400 Wayne, PA 19087 – USA customerservice@clsi.org

# **Table of contents**

Acknowledgements	р 6
Foreword	р 7
Key words	р 8
I. Introduction to quality	р 9
I-I:The importance of laboratory quality	p 10
I-2: Overview of the quality management system	р П
I-3:The quality management system model	р 13
I-4: History of laboratory quality management	р 16
I-5: International laboratory standards	p 17
I-6: Summary	p 18
2. Facilities and safety	р 19
2-1: Overview	p 20
2-2: Laboratory design	p 22
2-3: Geographic or spatial organization	p 23
2-4: Physical aspects of premises and rooms	p 24
2-5: Safety management programme	p 25
2-6: Identification of risks	p 27
2-7: Personal protective equipment	р 31
2-8: Emergency management and first aid	p 32
2-9: Summary	р 34
3. Equipment	р 35
3-I: Overview	•
3-2: Selecting and acquiring equipment	, 
3-3: Getting equipment ready for service	
3-4: Implementing an equipment maintenance programme	
3-5:Troubleshooting, service, repair and retiring equipment	
3-6: Equipment maintenance documentation	
3-7: Summary	
4. Purchasing and inventory	р 49
4-I: Overview	
4-2: Purchasing	
4-3: Implementing an inventory management programme	•
4-4: Quantification	54
4-5: Forms and logs	•
4-6: Receipt and storage of supplies	p 57
4-7: Monitoring inventory	
4-8: Summary	
5. Process control—sample management	D 61
5-1: Overview	•
5-2:The laboratory handbook	p 63
5-3: Collection and preservation	
5-4: Sample processing	
5-5: Sample storage, retention and disposal	
5-6: Sample transport	
5-7: Summary	

6. Process control—introduction to quality control	
7. Process control—quality control for quantitative tests	
7. Frocess control—quality control for quantitative tests	•
7-1: Over view	
7-2: Establishing the value range for the control material	
7-3. Establishing the value range for the control material	•
7-5: Interpreting quality control data	
7-6: Using quality control information	
7-5: Summary	
8. Process control—quality control for qualitative and	
semiquantitative procedures	р 91
8-I: Overview	p 92
8-2: Quality control materials	p 94
8-3: Quality control of stains	p 96
8-4: Quality control of microbiological media	p 98
8-5: Summary	p 100
9. Assessment—audits	р 101
9-I: Overview	р 102
9-2: External audit	р 105
9-3: Internal audit	р 107
9-4: Internal audit programme	р 108
9-5: Actions as result of audit	р 110
9-6: Summary	р III
10. Assessment—external quality assessment	р 113
10-1: Overview	p 114
10-2: Proficiency testing	р 117
10-3: Other external quality assessment methods	р 119
10-4: Comparison of external quality assessment methods	р 121
10-5: Managing external quality assessment in the laboratory	p 122
10-6: Summary	р 124
II.Assessment—norms and accreditation	р 125
II-I: Overview	р 126
I 1-2: International standards and standardization bodies	р 127
II-3: National standards and technical guidelines	р 129
II-4: Certification and accreditation	р 131
11-5: Process of accreditation	р 134
II-6: Benefits of accreditation	р 135
II-7: Summary	р 136
12. Personnel	р 137
12-1: Overview	
12-2: Recruitment and orientation	
12-3: Competency and competency assessment	
12-4: Training and continuing education	
12-5: Employee performance appraisal	
12-6: Personnel records	
12-7: Summary	р 150

13. Customer service	p	151
13-1: Overview	P	152
13-2:The laboratory clients—the customers	P	154
13-3: Assessing and monitoring customer satisfaction	P	157
13-4: Customer satisfaction surveys	P	158
13-5: Summary	P	160
14. Occurrence management	p	161
14-1: Overview	-	
14-2: Sources and consequences of laboratory error	D	163
14-3: Investigation of occurrences		
14-4: Rectifying and managing occurrences		
14-5: Summary		
15. Process improvement		169
15-1: Continual improvement concept		
15-2:Tools for process improvement		
15-3: Quality indicators		
15-4: Selecting quality indicators		
15-5: Implementing process improvement		
15-6: Summary		
•	•	
16. Documents and records		
16-1: Introduction		
16-2: Overview of documents		
16-3:The quality manual		
16-4: Standard operating procedures (SOPs)		
16-5: Document control		
16-6: Overview of records		
16-7: Storing documents and records		
16-8: Summary	P	196
17. Information management		
17-1: Overview		
17-2: Elements of information management		
17-3: Manual paper-based systems		
17-4: Computerized laboratory information systems		
17-5: Summary	P	207
18. Organization	p 2	209
18-1: Organizational requirements for a quality management system	P	210
18-2: Management role	P	212
18-3: Organizational structure	P	214
18-4: Organizational functions: planning	P	216
18-5: Organizational functions: implementation	P	218
18-6:The laboratory quality manual	P	220
18-7: Summary	P	222
Glossary		
Acronyms	-	
References and resources by chapter	p 2	237
Notes	p 2	245

# Acknowledgements

This handbook was developed through collaboration between the WHO Lyon Office for National Epidemic Preparedness and Response, the United States of America Centers for Disease Control and Prevention (CDC) Division of Laboratory Systems, and the Clinical and Laboratory Standards Institute (CLSI). It is based on training sessions and modules provided by the CDC and WHO in more than 25 countries, and on guidelines for implementation of ISO 15189 in diagnostic laboratories, developed by CLSI.

WHO, the CDC and the CLSI would like to acknowledge with thanks all those who contributed to the development and review of this training package, more specifically:

Adilya Albetkova Robin Barteluk **Anouk Berger** Sébastien Cognat Carlyn Collins Philippe Dubois **Christelle Estran Glen Fine Sharon Granade Stacy Howard Devery Howerton** Kazunobu Kojima Xin Liu Jennifer McGeary **Robert Martin** Sylvio Menna Michael Noble **Antoine Pierson Anne Pollock** Mark Rayfield Iohn Ridderhof **Eunice Rosner** Joanna Zwetyenga

## **Foreword**

Achieving, maintaining and improving accuracy, timeliness and reliability are major challenges for health laboratories. Countries worldwide committed themselves to build national capacities for the detection of, and response to, public health events of international concern when they decided to engage in the International Health Regulations implementation process.

Only sound management of quality in health laboratories will enable countries to produce test results that the international community will trust in cases of international emergency.

This handbook is intended to provide a comprehensive reference on Laboratory Quality Management System for all stakeholders in health laboratory processes, from management, to administration, to bench-work laboratorians.

This handbook covers topics that are essential for quality management of a public health or clinical laboratory. They are based on both **ISO 15189** and **CLSI GP26-A3** documents.

Each topic is discussed in a separate chapter. The chapters follow the framework developed by CLSI and are organized as the "12 Quality System Essentials". A diagram representing these 12 essentials is shown below.



### Note:

Health laboratories, in this handbook, is a term that is meant to be inclusive of clinical laboratories, diagnostic laboratories, medical laboratories, public health laboratories, animal and environmental health laboratories or any other laboratories performing testing for the purpose of disease diagnosis, screening, prevention, medical treatment decisions, surveillance or public health. Because all these terms for laboratories are frequently used interchangeably, the terms may likewise be used interchangeably in this handbook.

### **Revision information:**

The version 1.1 of the present handbook includes updated Glossary, Acronyms, and References and resources by chapter sections.

# Key words

Laboratory quality management system, laboratory quality, laboratory quality systems, laboratory information management, laboratory information system, laboratory documents and records, laboratory quality manual, quality control, laboratory facilities and safety, laboratory equipment, laboratory sample management, laboratory sample transport, laboratory purchasing and inventory, laboratory assessment, laboratory customer service, occurrence management, process improvement, quality essentials, laboratory process control, clinical laboratory, ISO 15189.

预览已结束,完整报告链接和二维码如下:

https://www.yunbaogao.cn/report/index/report?reportId=5 28859

