Kliinilis-laboratoorne katsetamine ja in vitro diagnostikasüsteemid. Infektsioossete agensite tundlikkuse katsetamine ja antimikroobse tundlikkuse katseseadmete tõhususe hindamine. Osa 1: Referentsmeetod aktiivsuse hindamiseks

Clinical laboratory testing and in vitro diagnostic test systems - Susceptibility testing of infectious agents and evaluation of performance of antimicrobial susceptibility devices - Part 1: Reference methods for testing the in vitro activity of antimicrobial agents against bacteria involved in infectious diseases

EESTI STANDARDI EESSÕNA **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN ISO 20776-1:2006 sisaldab Euroopa standardi EN ISO 20776-1:2006 ingliskeelset teksti. Käesolev dokument on jõustatud 21.12.2006 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN ISO 20776-1:2006 consists of the English text of the European standard EN ISO 20776-1:2006. This document is endorsed on 21.12.2006 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: This part of ISO 20776 describes one reference method, broth microdilution, for determination of MICs. The MIC reflects the activity of the drug under the described test conditions, and can be interpreted for clinical management purposes by taking into account other factors, such as drug pharmacology or bacterial resistance mechanisms. This allows categorization of bacteria as “susceptible” (S), “intermediate” (I), or “resistant” (R). In addition, MIC distributions can be used to define wild type or non-wild type bacterial populations. Although clinical interpretation of the MIC value is beyond the scope of this part of ISO 20776, modifications of the basic method are required for certain antimicrobial agent - bacteria combinations to facilitate clinical interpretation. These modifications are included in a separate table. It is advisable to compare other susceptibility testing methods (e.g. routine methods or diagnostic test devices) with this reference method for validation, in order to ensure comparable and reliable results.	**Scope:** This part of ISO 20776 describes one reference method, broth microdilution, for determination of MICs. The MIC reflects the activity of the drug under the described test conditions, and can be interpreted for clinical management purposes by taking into account other factors, such as drug pharmacology or bacterial resistance mechanisms. This allows categorization of bacteria as “susceptible” (S), “intermediate” (I), or “resistant” (R). In addition, MIC distributions can be used to define wild type or non-wild type bacterial populations. Although clinical interpretation of the MIC value is beyond the scope of this part of ISO 20776, modifications of the basic method are required for certain antimicrobial agent - bacteria combinations to facilitate clinical interpretation. These modifications are included in a separate table. It is advisable to compare other susceptibility testing methods (e.g. routine methods or diagnostic test devices) with this reference method for validation, in order to ensure comparable and reliable results.

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Clinical laboratory testing and in vitro diagnostic test systems - Susceptibility testing of infectious agents and evaluation of performance of antimicrobial susceptibility test devices - Part 1: Reference method for testing the in vitro activity of antimicrobial agents against rapidly growing aerobic bacteria involved in infectious diseases (ISO 20776-1:2006)

Systèmes d'essais en laboratoire et de diagnostic in vitro - Essais de réceptivité d'agents infectieux et évaluation des performances des dispositifs de réceptivité antimicrobienne - Partie 1: Méthode de référence pour la détermination de la sensibilité in vitro aux agents microbiens des bactéries aérobies à croissance rapide impliquées dans les maladies infectieuses (ISO 20776-1:2006)

Labormedizinische Untersuchungen und In-vitro-Diagnostika-Systeme - Empfindlichkeitsprüfung von Infektionserregern und Evaluation von Geräten zur antimikrobiellen Empfindlichkeitsprüfung - Teil 1: Referenzmethoden zur Testing der In-vitro-Aktivität von antimikrobiellen Substanzen gengen Bakterien, die Infektionskrankheiten verursachen (ISO 20776-1:2006)

This European Standard was approved by CEN on 14 November 2006.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Ref. No. EN ISO 20776-1:2006: E

Foreword

This document (EN ISO 20776-1:2006) has been prepared by Technical Committee CEN/TC 140 "In vitro diagnostic medical devices", the secretariat of which is held by DIN, in collaboration with Technical Committee ISO/TC 212 "Clinical laboratory testing and in vitro diagnostic test systems".

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2007, and conflicting national standards shall be withdrawn at the latest by May 2007.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

ANNEX ZA

(informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 98/79

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide one means of conforming to Essential Requirements of the New Approach Directive 98/79.

Once this standard is cited in the Official Journal of the European Communities under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard confers, within the limits of the scope of this standard, a presumption of conformity with the relevant Essential Requirements of that Directive and associated EFTA regulations.

WARNING: Other requirements and other EU Directives may be applicable to the products falling within the scope of this standard.

INTERNATIONAL STANDARD

ISO 20776-1

First edition
2006-11-15

Clinical laboratory testing and *in vitro* diagnostic test systems — Susceptibility testing of infectious agents and evaluation of performance of antimicrobial susceptibility test devices —

Part 1:

Reference method for testing the *in vitro* activity of antimicrobial agents against rapidly growing aerobic bacteria involved in infectious diseases

Systèmes d'essais en laboratoire et de diagnostic in vitro — Essais de réceptivité d'agents infectieux et évaluation des performances des dispositifs de réceptivité antimicrobienne —

Partie 1: Méthode de référence pour la détermination de la sensibilité in vitro aux agents microbiens des bactéries aérobies à croissance rapide impliquées dans les maladies infectieuses

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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 20776-1 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 140, In vitro *diagnostic medical devices*, in collaboration with Technical Committee ISO/TC 212, *Clinical laboratory testing and* in vitro *diagnostic test systems*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

ISO 20776 consists of the following parts, under the general title *Clinical laboratory testing and* in vitro *diagnostic test systems — Susceptibility testing of infectious agents and evaluation of performance of antimicrobial susceptibility test devices*:

— *Part 1: Reference method for testing the* in vitro *activity of antimicrobial agents against rapidly growing aerobic bacteria involved in infectious diseases*

— *Part 2: Evaluation of performance of antimicrobial susceptibility test devices*

Introduction

In vitro susceptibility tests are performed on microorganisms suspected of causing disease, particularly if the organism is thought to belong to a species that may exhibit resistance to frequently used antimicrobial agents. The tests are also important in resistance surveillance, epidemiological studies of susceptibility and in comparisons of new and existing agents.

Dilution procedures are used to determine the minimum inhibitory concentrations (MICs) of antimicrobial agents and are the reference method for antimicrobial susceptibility testing. MIC methods are used in resistance surveillance, comparative testing of new agents, to establish the susceptibility of organisms that give equivocal results in routine tests, for tests on organisms where routine tests may be unreliable and when a quantitative result is required for clinical management. In dilution tests, microorganisms are tested for their ability to produce visible growth on a series of agar plates (agar dilution) or in broth (broth dilution) containing serial dilutions of the antimicrobial agent.

The lowest concentration of an antimicrobial agent (in mg/l) that, under defined *in vitro* conditions, prevents the appearance of visible growth of a microorganism within a defined period of time is known as the MIC. The MIC is a guide for the clinician to the susceptibility of the organism to the antimicrobial agent and aids treatment decisions. Careful control and standardisation is required for intra- and inter-laboratory reproducibility, as results may be significantly influenced by the method used. It is generally accepted that broth MIC tests are reproducible to within one doubling dilution of the real end point (i.e. ± one well or tube in a doubling dilution series).

Broth dilution is a technique in which containers holding identical volumes of broth with antimicrobial agent solutions in incrementally (usually geometrically) increasing concentrations are inoculated with a known number of microorganisms.

Broth microdilution denotes the performance of the broth dilution test in microdilution trays.

The method described in this part of ISO 20776 is intended for the testing of pure cultures of aerobic bacteria that are easily grown by overnight incubation on agar and grow well in Mueller-Hinton broth, which may be supplemented. The broth microdilution method described in this part of ISO 20776 is essentially the same as those used in many countries, including France[1], Germany[2], Sweden[3], the United Kingdom[4], and the United States[5]. The method is also essentially the same as the broth microdilution method published by the European Committee on Antimicrobial Susceptibility Testing (EUCAST)[6]. All these methods are based on those described by Ericsson and Sherris[7].

Clinical laboratory testing and *in vitro* diagnostic test systems — Susceptibility testing of infectious agents and evaluation of performance of antimicrobial susceptibility test devices —

Part 1: Reference method for testing the *in vitro* activity of antimicrobial agents against rapidly growing aerobic bacteria involved in infectious diseases

WARNING — The use of this part of ISO 20776 may involve hazardous materials, operations and equipment. This part of ISO 20776 does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this part of ISO 20776 to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

1 Scope

This part of ISO 20776 describes one reference method, broth microdilution, for determination of MICs. The MIC reflects the activity of the drug under the described test conditions, and can be interpreted for clinical management purposes by taking into account other factors, such as drug pharmacology or bacterial resistance mechanisms. This allows categorization of bacteria as “susceptible” (S), “intermediate” (I), or “resistant” (R). In addition, MIC distributions can be used to define wild type or non-wild type bacterial populations. Although clinical interpretation of the MIC value is beyond the scope of this part of ISO 20776, modifications of the basic method are required for certain antimicrobial agent - bacteria combinations to facilitate clinical interpretation. These modifications are included in a separate table. It is advisable to compare other susceptibility testing methods (e.g. routine methods or diagnostic test devices) with this reference method for validation, in order to ensure comparable and reliable results.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1
antimicrobial agent
substance of biological, semi-synthetic or synthetic origin that inhibits the growth of or kills bacteria, and is thus of potential use in the treatment of infections

NOTE Disinfectants, antiseptics and preservatives are not included in this definition.

2.2 Antimicrobial agents — properties

2.2.1
potency
antimicrobially active fraction of a test substance, determined in a bioassay against a reference powder of the same substance