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Università degli Studi di Milano

Centro Interdipartimentale per la Riferibilità Metrologica in Medicina di Laboratorio (CIRME)

Direttore: Prof. Mauro Panteghini

sito web: http://users.unimi.it/cirme

JCTLM Members' and Stakeholders' Meeting
30 November -1 December 2015
BIPM, Sevres

JCTLM Database
Laboratory medicine and *in vitro* diagnostics

JCTLM Member Activities

CIRME

Centre for Metrological Traceability in Laboratory Medicine

Prof Mauro Panteghini

CIRME Scientific Coordinator

CIRME

Research Centre for Metrological Traceability in Laboratory Medicine (CIRME)

created on 2006 with the scope to join in a sole entity scientists and activities of various Departments of the University of Milan interested in the development of reference methods and calibration materials of high metrological order in the field of biomedical diagnostics.

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ACCREDIA
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Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC
Signatory of EA, IAF and ILAC Mutual Recognition Agreements

ilac-MRA

ACCREDIA ACCREDITATION ACCORDING TO ISO/IEC 17025 AND ISO 15195 STANDARDS

Tabella allegata al Certificato: 217 rev. 01
Responsabile: prof. Mauro PANTEGHINI
Sostituto: prof. Andrea MOSCA
Settori accreditati: 3

Laboratorio permanente

TABELLA DI ACCREDITAMENTO

Grandezza	Strumento in taratura	Campo di misura		Incertezza relativa (*)	Note
		Intervallo di concentrazione			
		da	a		
Attività catalitica	Alanina aminotransferasi (ALT)	0,063 µkat/L (3,8 U/L)	4,17 µkat/L (250 U/L)	2,3 %	
Attività catalitica	Fosfatasi alcalina (ALP)	0,067 µkat/L (4,0 U/L)	10,83 µkat/L (650 U/L)	2,5 %	
Attività catalitica	Aspartato aminotransferasi (AST)	0,063 µkat/L (3,8 U/L)	4,17 µkat/L (250 U/L)	2,5 %	
Attività catalitica	Creatina chinasi (CK)	0,083 µkat/L (5,0 U/L)	10,00 µkat/L (600 U/L)	2,5 %	
Attività catalitica	Gamma-glutamiltransferasi (GGT)	0,023 µkat/L (1,4 U/L)	4,58 µkat/L (275 U/L)	2,5 %	
Attività catalitica	Lattato deidrogenasi (LDH)	0,060 µkat/L (3,6 U/L)	10,00 µkat/L (600 U/L)	2,3 %	
Frazione di quantità di sostanza	Emoglobina glicata (HbA1c) con metodo HPLC-elettroforesi capillare	4 mmol/mol	150 mmol/mol	3,0 %	
Concentrazione di quantità di sostanza	Glucosio con metodo spettrofotometrico	0,28 mmol/l (5 mg/dl)	22,4 mmol/l (400 mg/dl)	1,80 %	

(*) L'incertezza di misura è espressa al livello di fiducia del 95%.

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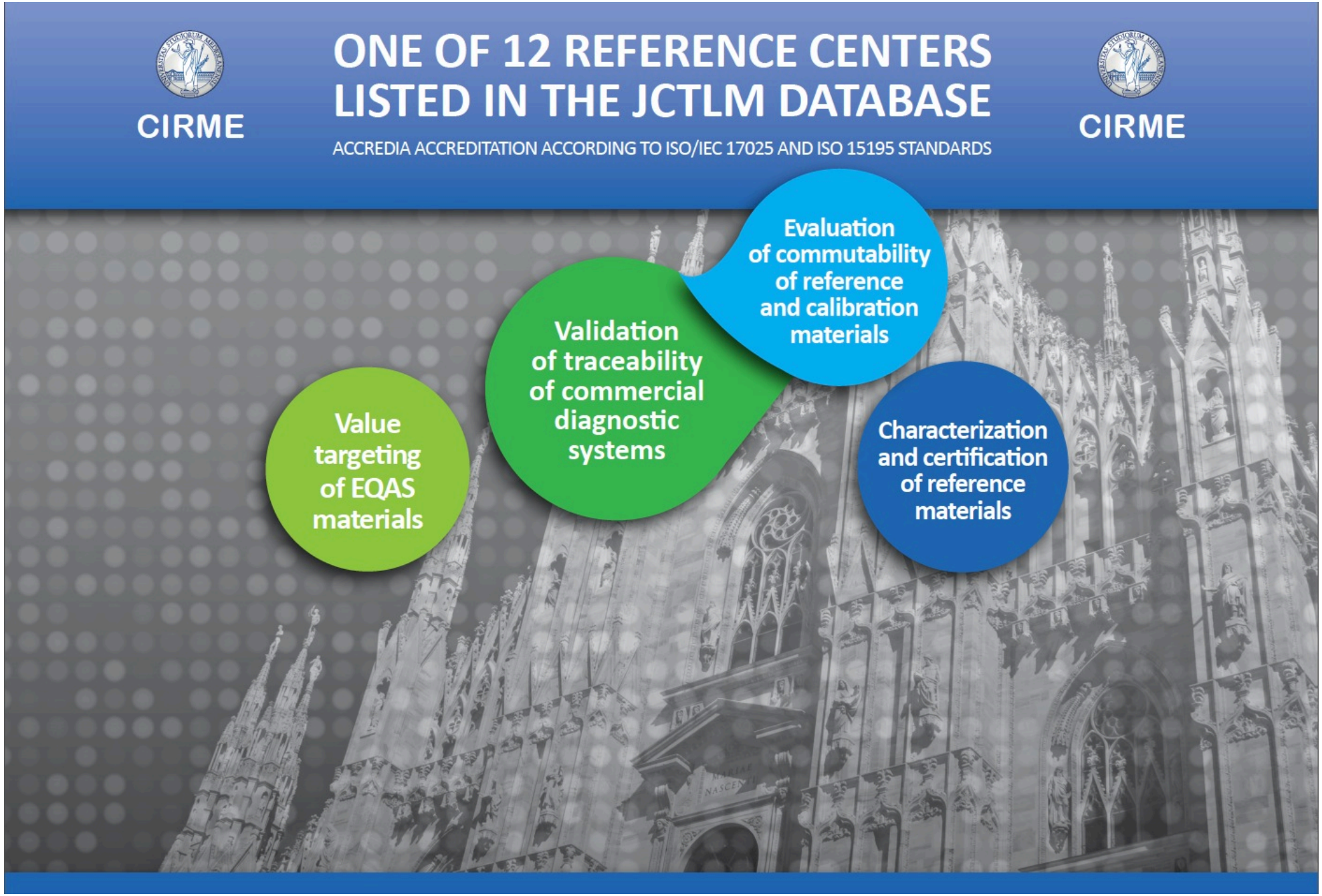

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In cooperation with

European Commission
Joint Research Centre
Institute for Reference Materials and Measurements

CERTIFICATE OF ANALYSIS

ERM®- DA470k/IFCC

HUMAN SERUM		
Proteins in the reconstituted material [1]	Mass concentration	
	Certified value [2] [g/L]	Uncertainty [3] [g/L]
α_2 macroglobulin (A2M)	1.43 [4]	0.06
α_1 acid glycoprotein (AAG)	0.617 [5]	0.013
α_1 antitrypsin (AAT)	1.12 [5]	0.03
albumin (ALB)	37.2 [4]	1.2
complement 3c (C3c)	1.00 [4]	0.04
complement 4 (C4)	0.162 [4]	0.007
haptoglobin (HPT)	0.889 [4]	0.021
immunoglobulin A (IgA)	1.80 [4]	0.05
immunoglobulin G (IgG)	9.17 [4]	0.18
immunoglobulin M (IgM)	0.723 [4]	0.027
transferrin (TRF)	2.36 [5]	0.08
transthyretin (TTR)	0.220 [5]	0.018

The following value for B2M was assigned:

Protein in the reconstituted material (see section 9.3)	Mass concentration	
	Certified value [2] [mg/L]	Uncertainty [3] [mg/L]
Beta-2-microglobulin (B2M) [1]	2.17	0.07

1) B2M as measured by immunonephelometry, immunoturbidimetry, fluorometric enzyme immunoassay and chemiluminescent immunoassay using a pure protein solution as calibrant.

2) The value is the unweighted mean of 13 accepted mean values, independently obtained by 13 laboratories. The certified mass concentration is traceable to the SI, via calibration with a pure protein solution of B2M.

3) Expanded uncertainty *U* with a coverage factor *k* = 2, corresponding to a level of confidence of approxiamtely 95 %, estimated in accordance with the Guide to the Expression of Uncertainty in Measurement (GUM), ISO, 1995.

Clin Chem Lab Med 2010;48(6):795–803 © 2010 by Walter de Gruyter • Berlin • New York. DOI 10.1515/CCLM.2010.146

Poster Abstracts – IFCC WorldLab Istanbul 2014 – Istanbul, 22-26 June 2014 • DOI 10.1515/cclm-2014-4057
Clin Chem Lab Med 2014; 52, Special Suppl, pp S1 – S1760, June 2014 • Copyright © by Walter de Gruyter • Berlin • Boston S1657

Standardisation, accreditation and harmonisation

Cod: 1516

Traceability of values for catalytic activity concentration of enzymes: a Certified Reference Material for aspartate transaminase

Brigitte Toussaint[1,*], Hendrik Emons[1], Heinz G. Schimmel[1], Steffen Bossert-Reuther[2], Francesca Canalias[3], Ferruccio Ceriotti[4], Georges Férard[5], Carlo A. Ferrero[4], Paul F.H. Franck[6], F. Javier Gella[7], Joseph Henny[8], Poul J. Jørgensen[9], Rainer Klauke[10], Jean-Marc Lessinger[11], Daniel Mazziotta[12], Mauro Panteghini[13], Shigeru Ueda[14] and Gerhard Schumann[10] on behalf of the IFCC Committee on Reference Systems for Enzymes

COMMUTABILITY STUDY ON CANDIDATE MATERIALS FOR THREE NEW ENZYME CERTIFIED REFERENCE MATERIALS

B. Toussaint[4], F. Ceriotti[8], H. Schimmel[4], R. Rej[10], M. Besozzi[6], F.J. Gella[2], G. Giana[7], J. Lessinger[5], M. McCusker[1], M. Orth[9], M. Panteghini[3]

Study setup: 14 serum samples were analysed with existing CRMs and with the new candidate CRMs, using 8 different assays and 1 reference method. Results obtained by different methods were compared paire-wise and the proximity of candidate materials to patient samples in the plots, sign of similar behaviour, was investigated.

Existing CRMs to be replaced:

- CK: ERM-AD455/IFCC (CK-MB) Purified from human heart Lyophilised
- ALT: ERM-AD454/IFCC (cytosolic) Purified from pig heart Lyophilised
- LD: ERM-AD453/IFCC (LD1) Purified from human erythrocytes Lyophilised

New candidate CRMs:

2 candidates for CK ~300 U/L
2 candidates for ALT ~100 U/L
1 candidate for LD ~300 U/L
Material type: Recombinant Lyophilised or frozen

Measurements

- **Routine assays:**

Analytical systems
Abbott ci8200
Beckman Coulter Synchron DxC800
Ortho Clinical Diagnostics - Vitros 5600
Olympus AU480
Roche Modular Analytics
Roche cobas c501
Siemens - Advia 2400
Siemens - Dimension Vista_1500

- **IFCC Reference Measurement Procedure at 37 °C**

Infusino I, Braga F, Mozzi R, Valente C, Panteghini M
Clinica Chimica Acta 412 (2011) 791–792

Contents lists available at ScienceDirect

Clinica Chimica Acta

journal homepage: www.elsevier.com/locate/clinchim

Letter to the Editor

Is the accuracy of serum albumin measurements suitable for clinical application of the test?

Probably not

Table 1
Relative standard uncertainties for each contributing factor in determination of serum albumin with Roche Tina-quant immunoturbidimetric assay on Cobas c 501 platform. Data obtained by measurements of ERM-DA 470k/IFCC Human Serum Proteins reference material (certified value ± expanded uncertainty, 37.2 g/L ± 1.2 g/L).

Factor	Result
Imprecision (u_{Rw})	1.88%
Bias (u_{bias})	6.42%
Relative combined standard uncertainty [$u_c = (u_{bias}^2 + u_{Rw}^2)^{0.5}$]	6.69%

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Pasqualetti S, Infusino I, Carnevale A, Szőke D, Panteghini M.

Clin Chim Acta. 2015 2015;450:125-6

Contents lists available at ScienceDirect

Clinica Chimica Acta

journal homepage: www.elsevier.com/locate/clinchim

Letter to the editor

The calibrator value assignment protocol of the Abbott enzymatic creatinine assay is inadequate for ensuring suitable quality of serum measurements

Note: For serum creatinine measurements on patient samples, the acceptable limits for expanded uncertainty derived from its CVI are 6.0% (desiderable) and 9.0% (minimum quality level), respectively.

Table 1
Uncertainties for each contributing factor in determination of serum creatinine with Abbott enzymatic assay on Architect *c*16000 platform after calibration with two different lot of system calibrator. Data obtained by measurements of NIST SRM 967a reference material (certified value ± expanded uncertainty: L1, 0.847 mg/dL ± 0.018 mg/dL and L2, 3.877 mg/dL ± 0.082 mg/dL).

	SRM 967a level 1	SRM 967a level 2
Multigent Clin Chem Calibrator lot no. 40043Y600		
Imprecision (u_{Rw})	0.47%	0.40%
Bias (u_{bias})	3.57%	7.05%
Relative combined standard uncertainty [$u_c = (u_{bias}^2 + u_{Rw}^2)^{0.5}$]	3.60%	7.06%
Expanded uncertainty ($U = k \times u_c$)	7.20%	14.12%
Multigent Clin Chem Calibrator lot no. 40496Y600		
Imprecision (u_{Rw})	0.53%	0.42%
Bias (u_{bias})	4.02%	1.71%
Relative combined standard uncertainty [$u_c = (u_{bias}^2 + u_{Rw}^2)^{0.5}$]	4.05%	1.76%
Expanded uncertainty ($U = k \times u_c$)	8.10%	3.52%

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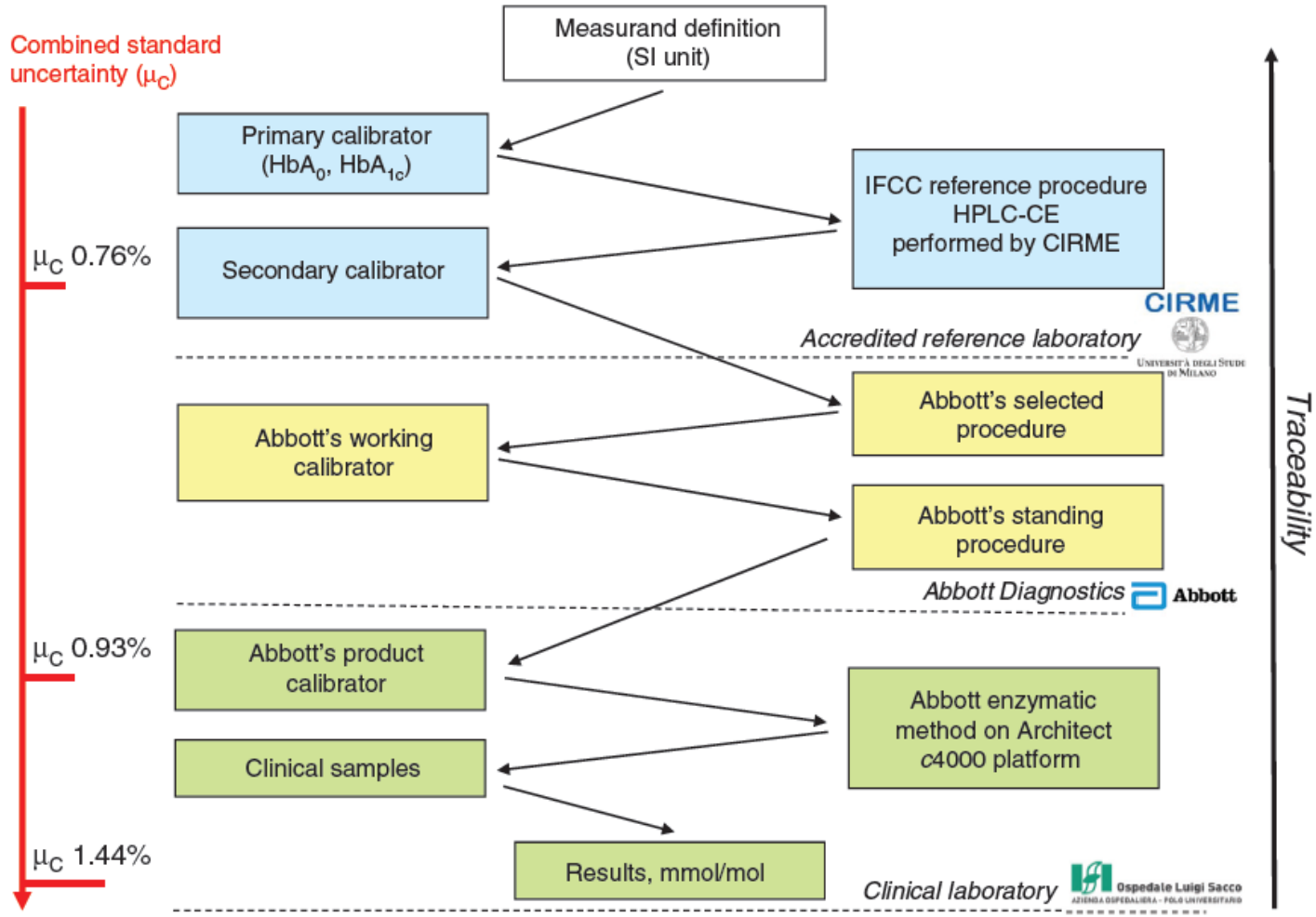
Letter to the Editor

Dominika Szőke*, Assunta Carnevale, Sara Pasqualetti, Federica Braga, Renata Paleari and Mauro Panteghini

More on the accuracy of the Architect enzymatic assay for hemoglobin A_{1c} and its traceability to the IFCC reference system



Analytical goals for HbA_{1c} measurement

Quality level	u_c
Optimal	≤0.6
Desirable	≤1.3
Minimal	≤1.9

Houston
we have a problem.

Currently, the full information about calibration is usually not available

Manufacturers only provide the name of higher order reference material or procedure to which the assay calibration is traceable, without any description of implementation steps and their corresponding uncertainty.

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Opinion Paper

Federica Braga*, Ilenia Infusino and Mauro Panteghini

Performance criteria for combined uncertainty budget in the implementation of metrological traceability

Table 2: The information that in vitro diagnostics manufacturers should provide to laboratory users about the implementation of metrological traceability of their commercial systems. Adapted from [7].

a) An indication of higher order references (materials and/or procedures) used to assign traceable values to calibrators;
b) Which internal calibration hierarchy has been applied by the manufacturer, and
c) A detailed description of each step;
d) The (expanded) combined uncertainty value of commercial calibrators, and
e) Which, if any, acceptable limits for uncertainty of calibrators were applied in the validation of the analytical system.

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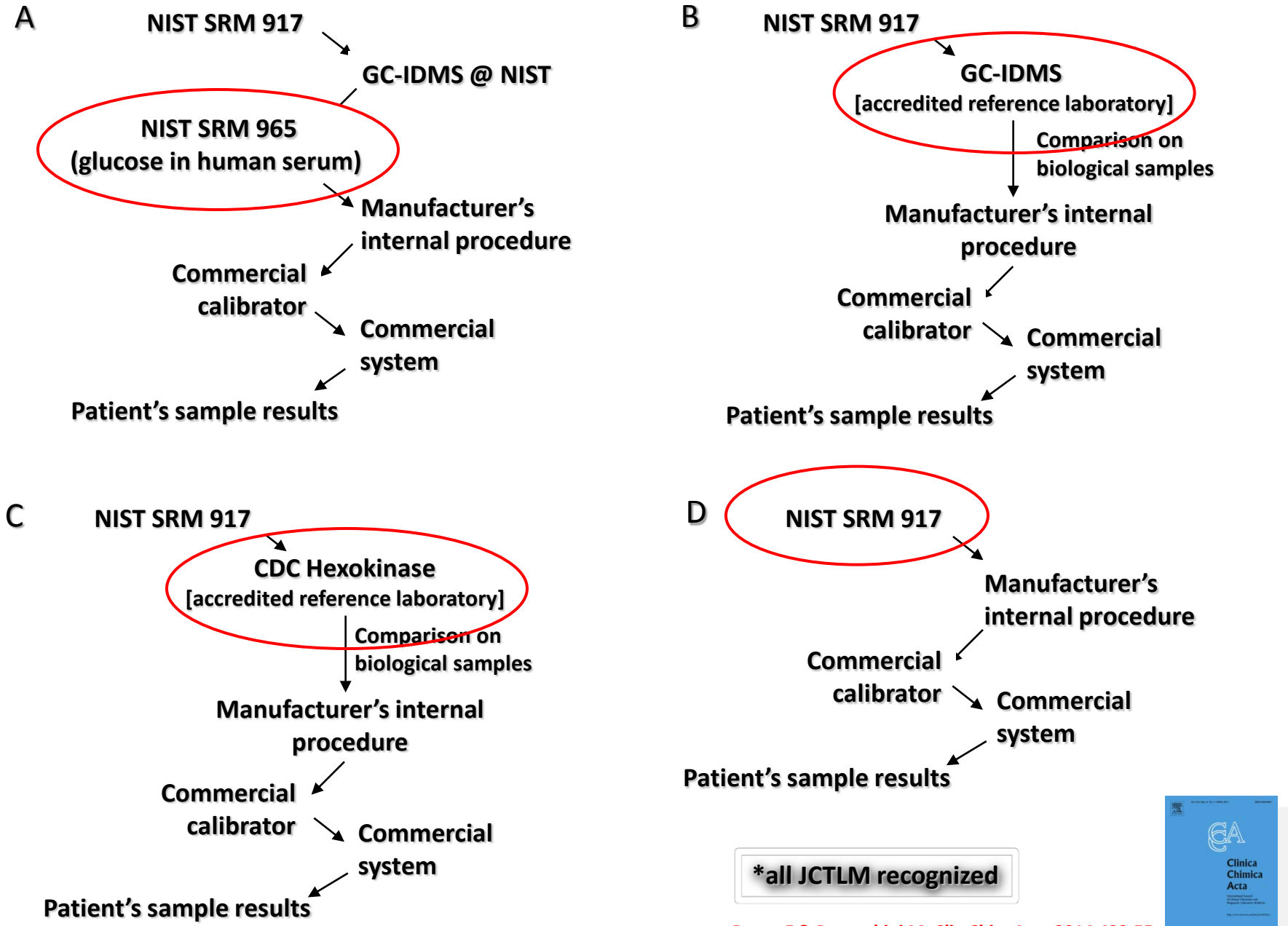
Types of metrological chains that can be used to implement the traceability of blood glucose results*



*all JCTLM recognized

Braga F & Panteghini M, Clin Chim Acta 2014;432:55

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Clinica Chimica Acta 432 (2014) 55–61

Contents lists available at ScienceDirect

Clinica Chimica Acta

journal homepage: www.elsevier.com/locate/clinchim

Verification of in vitro medical diagnostics (IVD) metrological traceability: Responsibilities and strategies

Federica Braga *, Mauro Panteghini

Centre for Metrological Traceability in Laboratory Medicine (CIRME), University of Milan, Milan, Italy

Table 1

Metrological traceability and uncertainty information derived from calibrator package inserts of commercial systems measuring blood glucose marketed by four IVD companies.

Company	Platform	Principle of commercial method	Calibrator	Declared standard uncertainty[a]	Higher-order reference employed		Type of traceability chain used[b]	Combined standard uncertainty associated with the used chain[c]
					Method	Material		
Abbott	Architect	ND	Multiconstituent calibrator	2.70%	IDMS	NIST SRM 965	A	1.22-1.45%[d]
Beckman	AU	Hexokinase	System calibrator	ND	ND	NIST SRM 965	A	1.22-1.45%[d]
	Synchron	Hexokinase	Synchron multicalibrator	ND	ND	NIST SRM 917a	D	1.60-3.00%[e]
Roche	Cobas c	Hexokinase	C.f.a.s.	0.84%	IDMS	ND	B	1.70%
	Integra	Hexokinase	C.f.a.s.	0.62%	IDMS	ND	B	1.70%
	Modular	Hexokinase	C.f.a.s.	0.84%	IDMS	ND	B	1.70%
		GOD		0.84%	IDMS	ND	B	1.70%
Siemens	Advia	Hexokinase	Chemistry calibrator	1.30%	Hexokinase	NIST SRM 917a	C	1.88-3.26%[f]
		GOD		0.80%	Hexokinase	NIST SRM 917a	C	1.88-3.26%[f]

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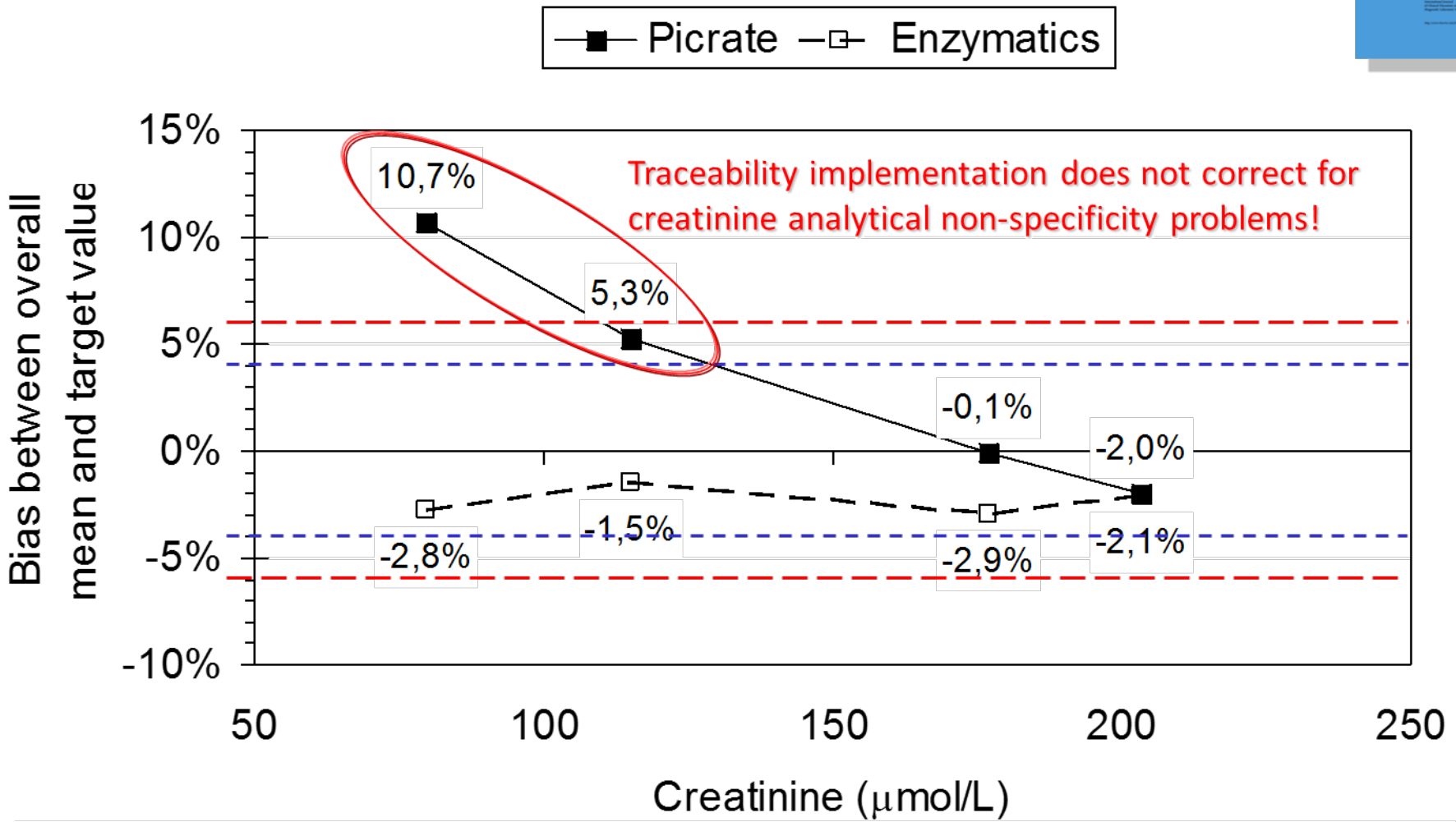
Carobene A et al., Clin Chim Acta 2014;427:100



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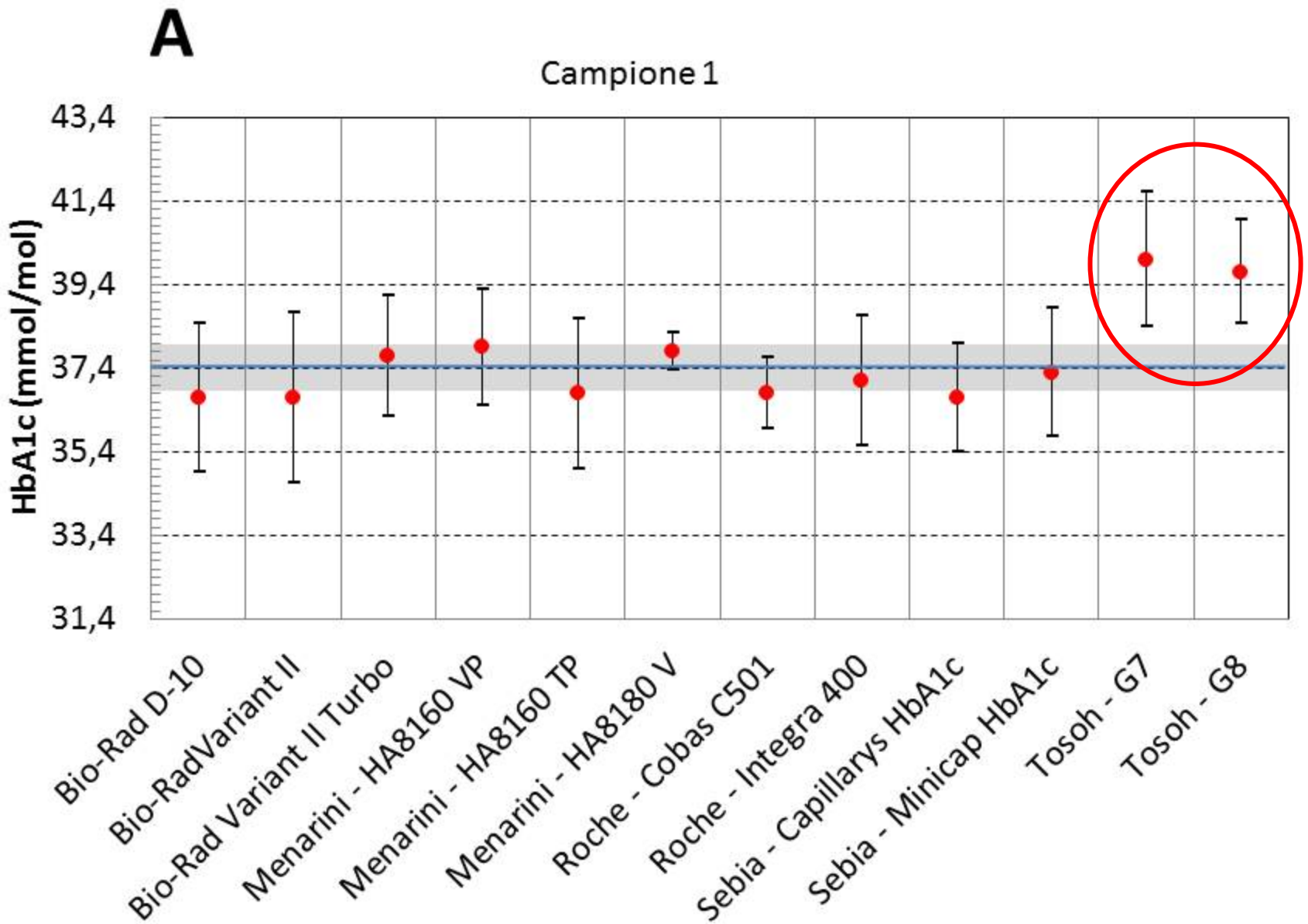
Percent bias of overall means for the two method macro-categories based on different analytic principle in post-standardization years (2010-2011). The dotted and the dashed line indicate the maximum acceptable bias at desirable (±4.0%) and at minimum quality level (±6.0%), respectively.



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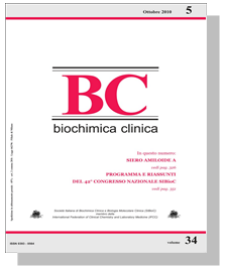
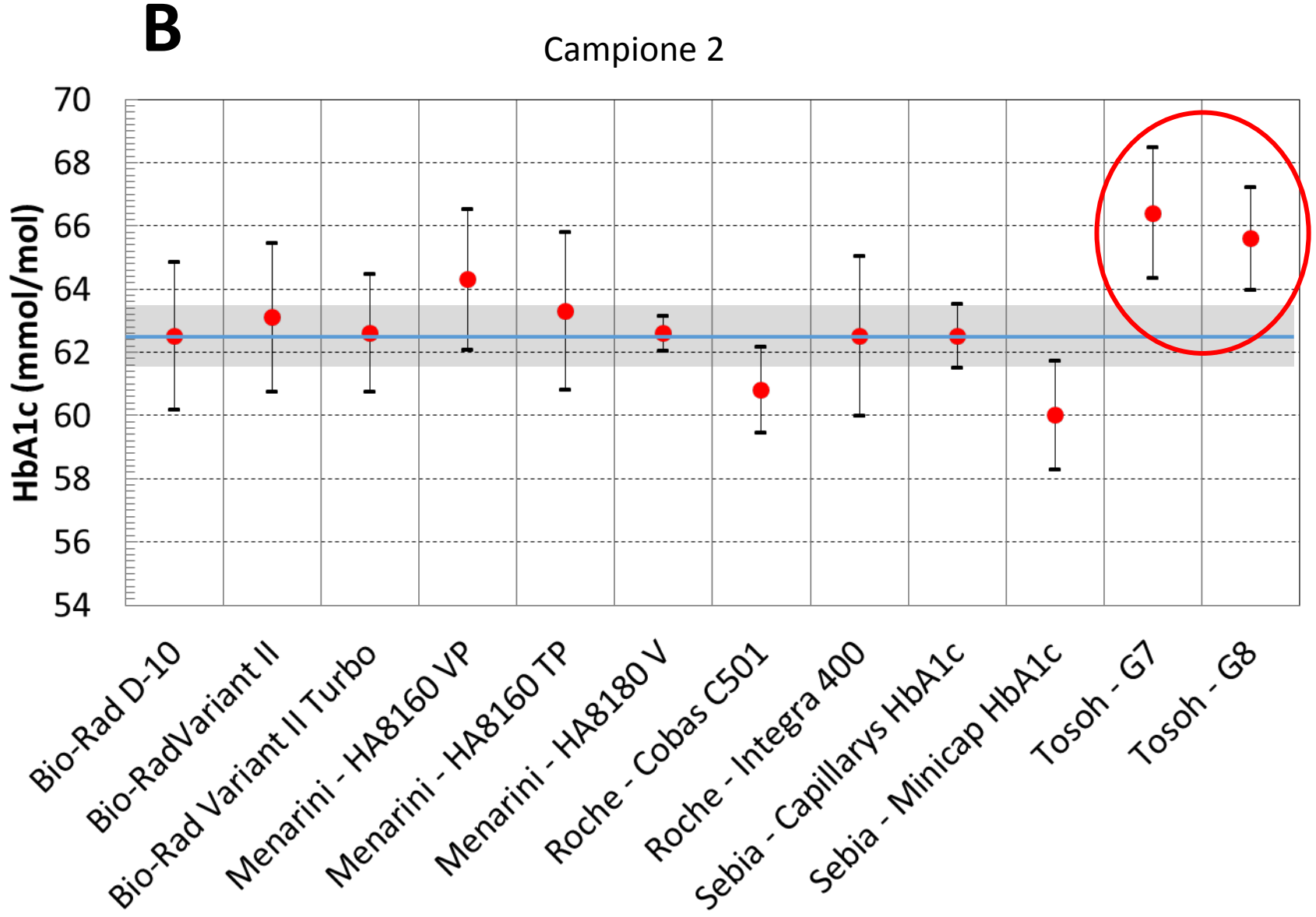
Mosca A et al., Biochim Clin 2015;39:in press



B



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Mosca A et al., Biochim Clin 2015;39:in press

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Research Centre for Metrological Traceability in Laboratory Medicine (CIRME) – Educational activities

CIRME organizes international and national conferences on the topic of Traceability and Standardization in Laboratory Medicine and works actively to promote postgraduate specialization courses

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Direttore: Prof. Mauro Panteghini

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Centro Interdipartimentale per la Riferibilità Metrologica in Medicina di Laboratorio (CIRME)
under the auspicies of the
IFCC
Scientific Meeting
STANDARDIZATION OF HETEROGENEOUS ANALYTE MEASUREMENTS: THE EXAMPLE OF HEMOGLOBIN A1c
6 November 2007
MILANO
Aula Magna - Univ
Via Festa del
Università degli Studi di Milano
Centro Interdipartimentale per la Riferibilità Metrologica in Medicina di Laboratorio (CIRME)
under the auspicies of the
IFCC
JCTLM
The Joint Committee for Traceability in Laboratory Medicine
2nd International Scientific Meeting
STANDARDIZATION IN CLINICAL ENZYMOLOGY: A CHALLENGE FOR THE THEORY OF METROLOGICAL TRACEABILITY
MILANO
25 November 2008
Aula Magna
Settore Didattico Colombo
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Centro Interdipartimentale per la Riferibilità Metrologica in Medicina di Laboratorio (CIRME)
under the auspicies of the
IFCC
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The Joint Committee for Traceability in Laboratory Medicine
3rd International Scientific Meeting
STANDARDIZATION OF PROTEIN BIOMARKER MEASUREMENTS: NEW INITIATIVES FOR REFERENCE MEASUREMENT SYSTEMS
MILANO
17 November 2009
Aula Magna
Settore Didattico Colombo
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The Joint Committee for Traceability in Laboratory Medicine
4th International Scientific Meeting
RETHINKING QUALITY CONTROL IN THE TRACEABILITY ERA
MILANO
NOVEMBER 30th, 2010
Aula Magna - Settore Didattico Colombo
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Via L. Mangiagalli 25, Milano
External Quality Assessment
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The Joint Committee for Traceability in Laboratory Medicine
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EFCC
5th International Scientific Meeting
STANDARDIZATION OF CARDIAC TROPONIN I: THE ONGOING INTERNATIONAL EFFORTS
Università degli Studi di Milano
Centro Interdipartimentale per la Riferibilità Metrologica in Medicina di Laboratorio (CIRME)
under the auspices of
JCTLM
The Joint Committee for Traceability in Laboratory Medicine
IFCC
EFLM
6th International Scientific Meeting
NEW BIOLOGIC AND ANALYTIC ISSUES ON HEMOGLOBIN A2 AND OTHER MINOR HEMOGLOBINS
November 27th, 2012
Milano
Aula Magna - Settore Didattico Colombo
EUROMEDLAB MILANO 2013
20th IFCC-EFLM European Congress of Clinical Chemistry and Laboratory Medicine
48th Congress of the Italian Society of Clinical Biochemistry and Clinical Molecular Biology (SIBioC)
POST-CONGRESS SATELLITE MEETINGS
May 24th, 2013
CIRME
7th CIRME International Scientific Meeting
Metrological traceability and assay standardization
Stresa, Italy
in cooperation with Interdipartimental Centre for Metrological Traceability in Laboratory Medicine, University of Milano
Università degli Studi di Milano
Centro Interdipartimentale per la Riferibilità Metrologica in Medicina di Laboratorio (CIRME)
under the auspices of
JCTLM
The Joint Committee for Traceability in Laboratory Medicine
IFCC
EFLM
9th International Scientific Meeting
STRUCTURING EQAS FOR MEETING METROLOGICAL CRITERIA: READY FOR PRIME TIME
MILANO, ITALY
November 27th, 2015
AULA MAGNA - SETTORE DIDATTICO COLOMBO
Università degli Studi
Via L. Mangiagalli 25, Milano
EFLM
European Commission Joint Research Centre
IRMM
CIRME
1st EFLM Strategic Conference
Defining analytical performance goals 15 years after the Stockholm Conference
8th CIRME International Scientific Meeting
Milan (IT)
24-25 November 2014
with the auspices of IFCC
The Stockholm conference in 1999 entitled 'Strategies to Set Analytical Quality Specifications in Laboratory Medicine' was a landmark in trying to achieve a consensus on how quality requirements should be set and a "hierarchy" was established. It is time to revisit this hierarchy investigating to what extent the advocated hierarchy is still valid or if it should be changed or expand, taking also into account performance goals for qualitative tests and for the whole testing procedure including pre- and post-analytical aspects.
SCIENTIFIC COMMITTEE
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Callun Fraser, UK
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Graham Jones, Australia
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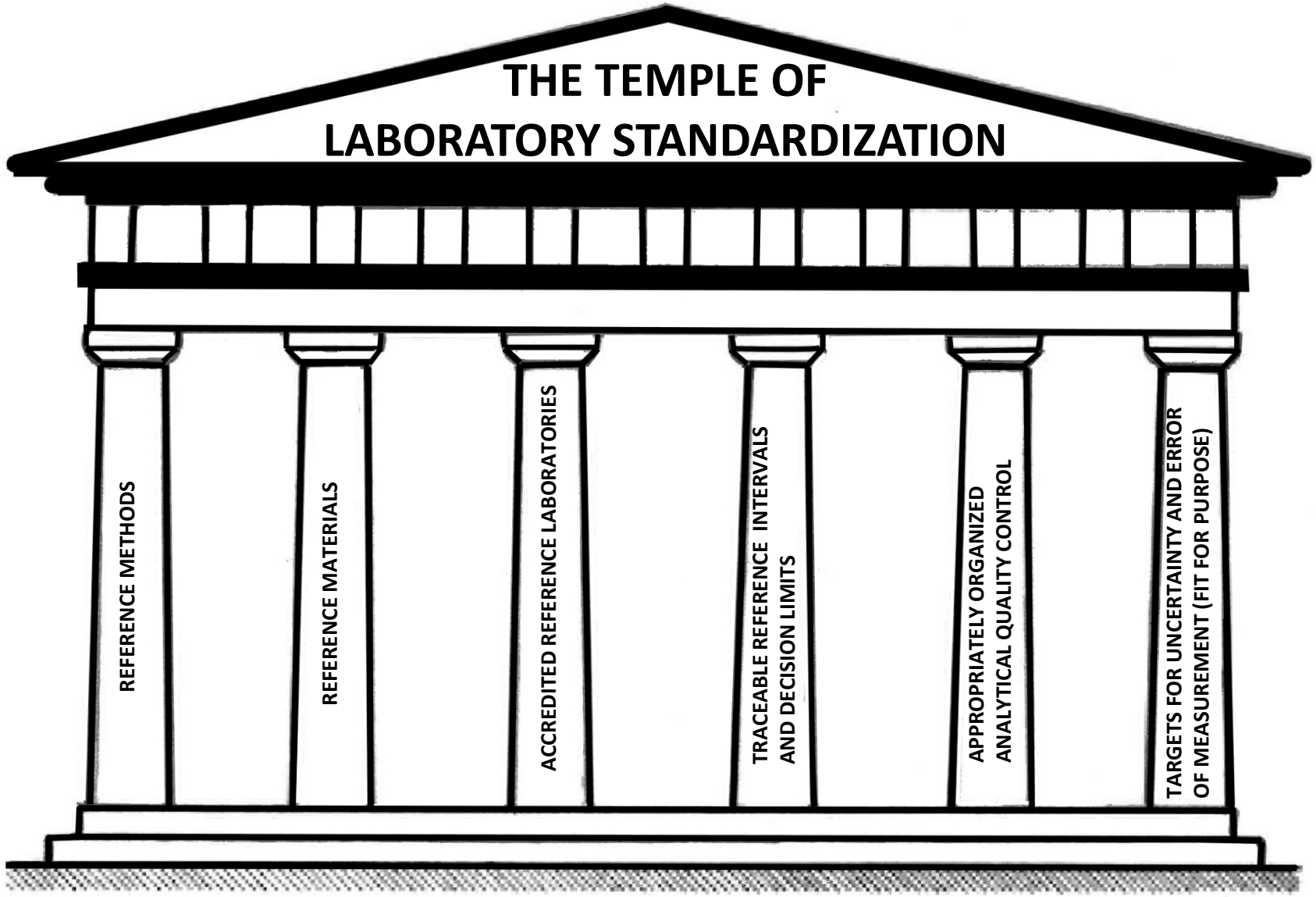
Tel. +39 0266802323 ext 917
Ms Patrizia Sirtori - patrizia.sirtori@mzcongressi.com

THE TEMPLE OF LABORATORY STANDARDIZATION



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Braga F & Panteghini M, Clin Chim Acta 2014;432:55

Lack of proper reference intervals/decision limits may hamper the implementation of standardization

- The implementation of standardization can modify the analyte results
- Without adequate R.I./D.L. this situation can impair the interpretation of the results and, paradoxically, worsen the patient's outcome
- The absence of reliable R.I./D.L. for the newly standardized commercial methods hampers their adoption

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[Adapted from Ceriotti F, Hinzmann R, Panteghini M. Ann Clin Biochem 2009;46:8]

Traceable reference intervals as 4th pillar of the reference measurement system: how a problem becomes a solution

Historically

Traceability era

Method-dependent results

↓

Method-dependent reference intervals

Standardized methods that provide traceable results

↓

Traceable reference intervals

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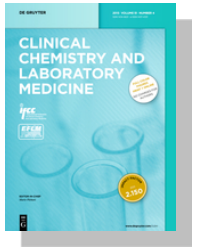
[Infusino I, Schumann G, Ceriotti F, Panteghini M. CCLM 2010;48:301]

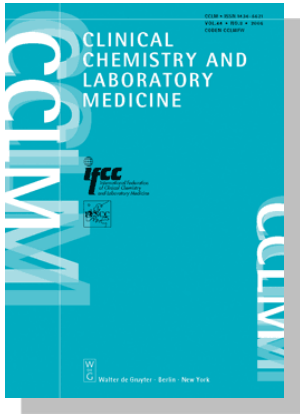


Clin Chem Lab Med 2010;48(11):1593–1601 © 2010 by Walter de Gruyter • Berlin • New York. DOI 10.1515/CCLM.2010.315

Research Article

Common reference intervals for aspartate aminotransferase (AST), alanine aminotransferase (ALT) and γ-glutamyl transferase (GGT) in serum: results from an IFCC multicenter study

Ferruccio Ceriotti[1,*], Joseph Henny[2], Josep Queraltó[3], Shen Ziyu[4], Yeşim Özarda[5], Baorong Chen[6], James C. Boyd[7] and Mauro Panteghini[8] on behalf of the IFCC Committee on Reference Intervals and Decision Limits (C-RIDL) and Committee on Reference Systems for Enzymes (C-RSE)



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The implementation of standardization in clinical practice needs first the availability of the 3 main pillars:

- Reference measurement procedures
- Reference materials
- Accredited reference laboratories

Then, it needs to define a 4th pillar:

- Traceable reference intervals/decision limits

And, finally, an appropriately organized analytical (internal and external) quality control should become the 5th pillar.

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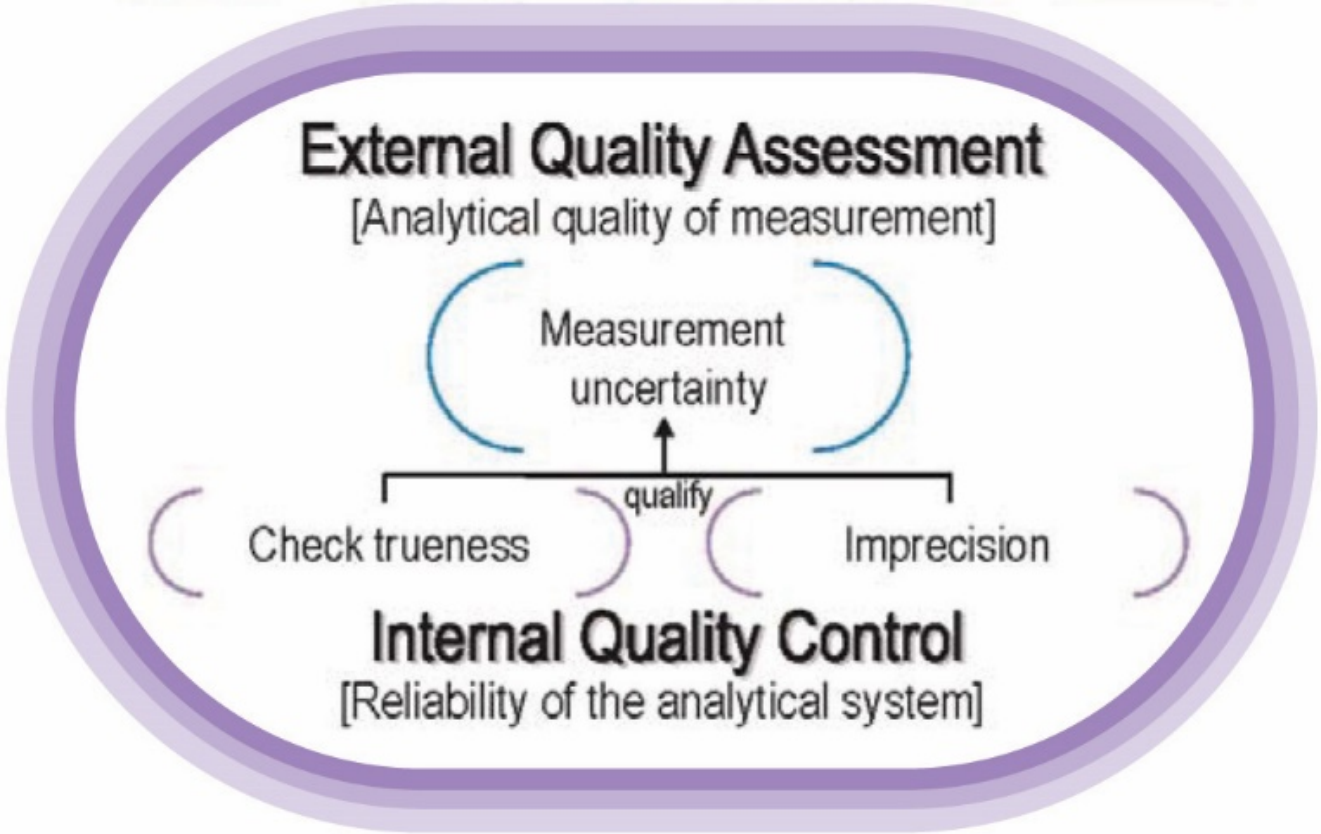
4th CIRME International Scientific Meeting

RETHINKING QUALITY CONTROL IN THE TRACEABILITY ERA

Milano - 30 November 2010

CIRME



MILANO - *NOVEMBER 30th, 2010*

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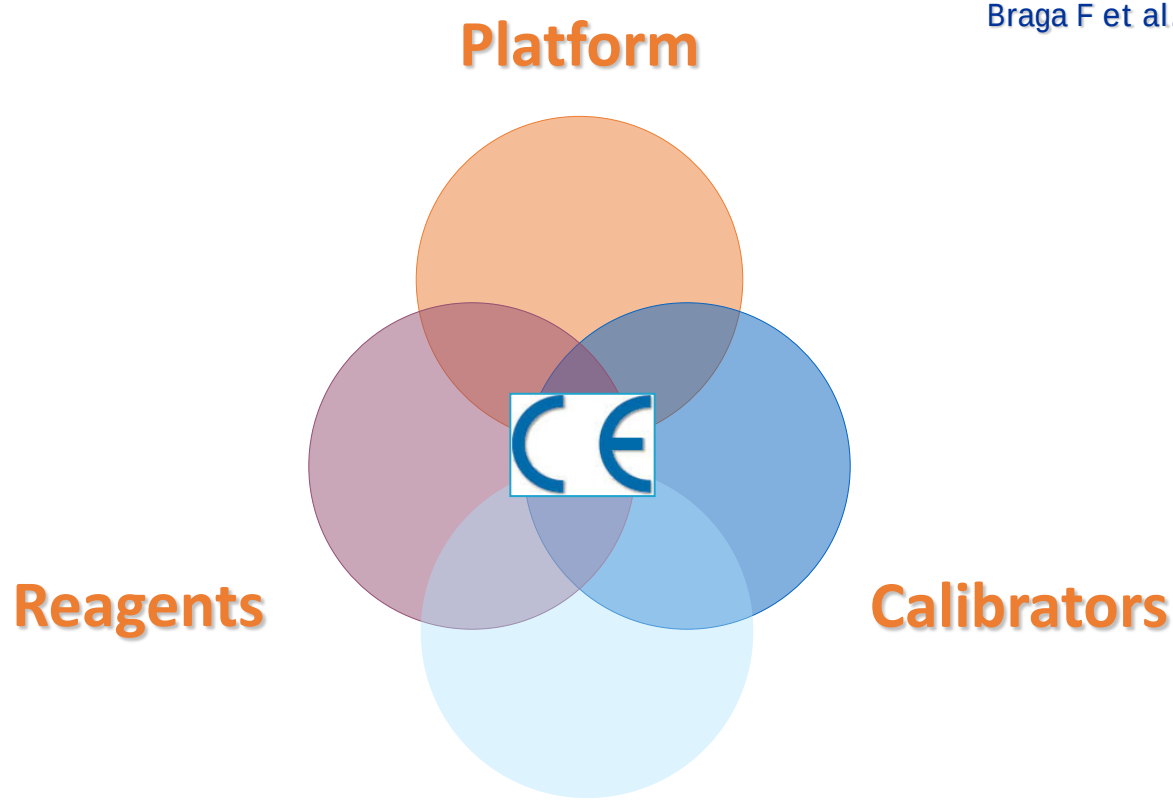
Monitoring the reliability of the analytical system through IQC: Component I. Check alignment ("system traceability")

Braga F et al. J Med Biochem 2015;34:282-7



Clinical laboratories must verify the consistency of declared performance during routine operations performed in accordance with the manufacturer's instructions, by checking that values of control materials provided by the manufacturer as component of the analytical system are in the established range, with no clinically significant changes in the assumed traceable results.

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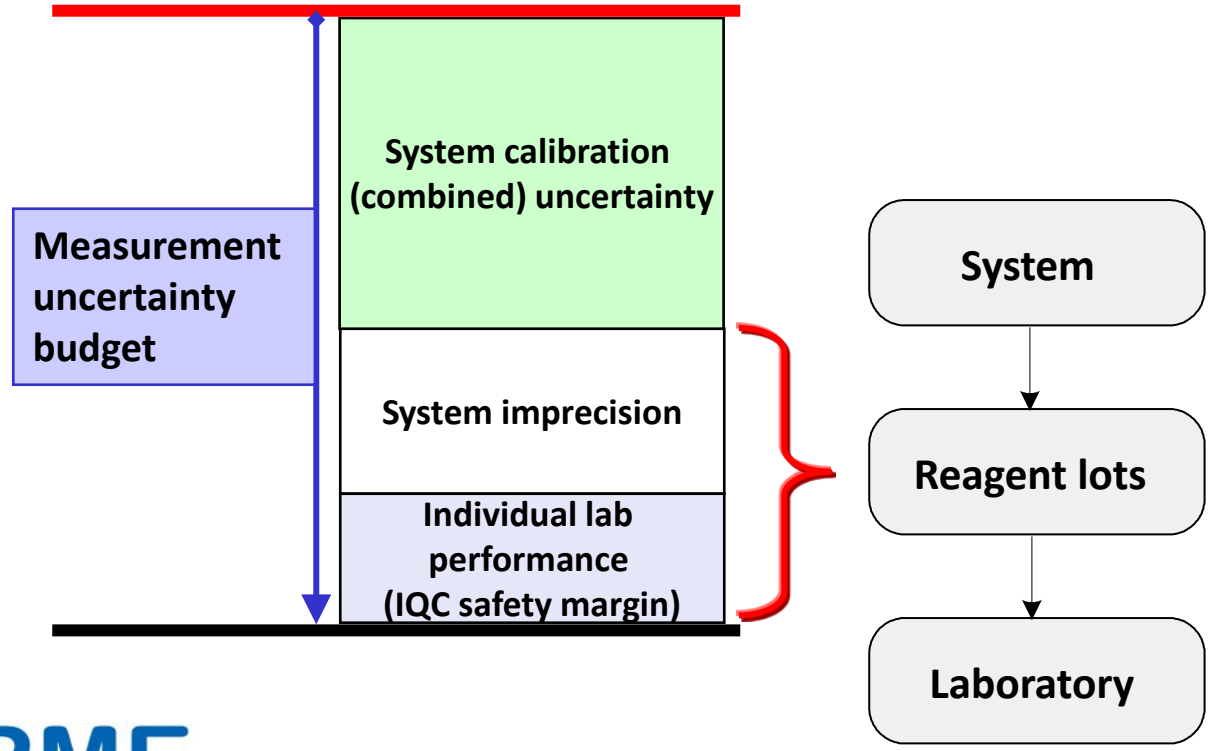
Monitoring the reliability of the analytical system through IQC: Component II. Estimating the measurement uncertainty due to random effects ("imprecision")



Main characteristics for a control material to be used in the IQC component II program in order to derive the uncertainty of the analytical system due to the random effects.

Requirement	Comment
Material from a third-party independent source should be used	Material must be different from the system control material used for checking alignment (IQC component I)
Material should closely resemble authentic patient samples (fulfil commutability) (e.g., fresh-frozen pool)	Commercial non-commutable controls may provide a different impression of imprecision performance
Material concentration levels should be appropriate for the clinical application of the analyte measurement	When clinical decision cut-points are employed for a given analyte, materials around these concentrations should preferentially be selected

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Braga F et al. J Med Biochem 2015;34:282-7
Braga F, Infusino I, Panteghini M. Clin Chem Lab Med 2015;53:905–12

DE GRUYTER Clin Chem Lab Med 2015; aop

Sverre Sandberg*, Callum G. Fraser, Andrea Rita Horvath, Rob Jansen, Graham Jones, Wytze Oosterhuis, Per Hyltoft Petersen, Heinz Schimmel, Ken Sikaris and Mauro Panteghini

Defining analytical performance specifications: Consensus Statement from the 1st Strategic Conference of the European Federation of Clinical Chemistry and Laboratory Medicine

Model 1: Based on the effect of analytical performance on clinical outcomes a. Done by direct outcome studies – investigating the impact of analytical performance of the test on clinical outcomes; b. Done by indirect outcome studies – investigating the impact of analytical performance of the test on clinical classifications or decisions and thereby on the probability of patient outcomes, e.g., by simulation or decision analysis.
Model 2: Based on components of biological variation of the measurand.
Model 3: Based on state of the art of the measurement (i.e., the highest level of analytical performance technically achievable).

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EQAS categorization

Miller WG et al. Clin Chem 2011;57:1670

	Evaluation capability							
				Accuracy				
				Individual laboratory				
	Sample characteristics				Relative to participant results		Reproducibility	
Category	Commutable	Value assigned with RMP[a] or CRM	Replicate samples in survey	Absolute vs RMP or CRM	Overall	Peer group	Individual laboratory intralab CV	Measurement procedure interlab CV
1	Yes	Yes	Yes	X	X	X	X	X
2	Yes	Yes	No	X	X	X		X

Category 1A → Milan model 1 or 2 as basis for Perf. Specs

Category 1B → Other models

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9th CIRME International Scientific Meeting

STRUCTURING EQAS FOR MEETING METROLOGICAL CRITERIA: READY FOR PRIME TIME

Milano – 27 November 2015

The application of the analytical performance specifications can be modulated depending on its use. For example:

- Manufacturers producing calibrators
- Reference material providers
- Individual laboratories who provide patient results
- EQAS organizations

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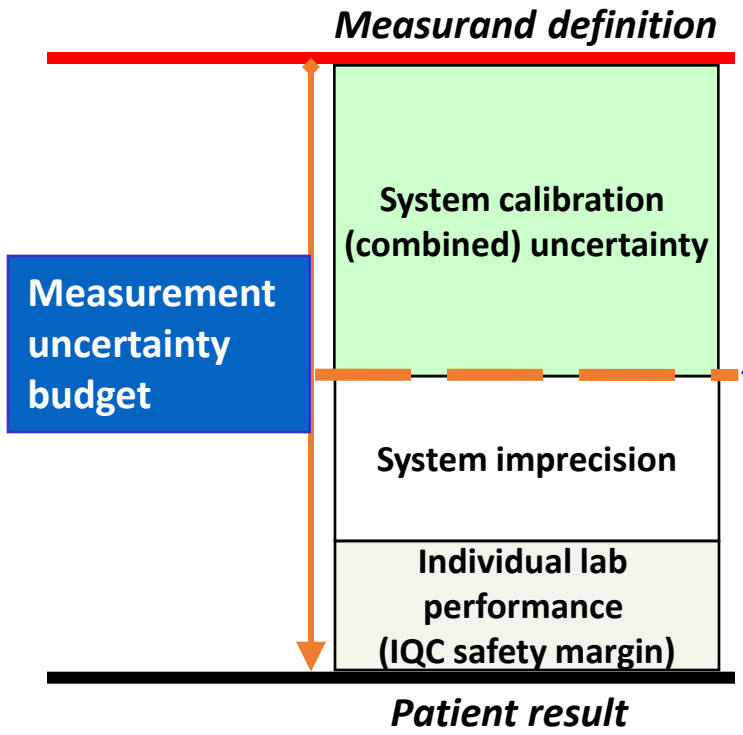
Need to define criteria for manufacturers that can be achieved for their calibrators leaving enough uncertainty budget for the laboratories to produce clinically acceptable results.



→ **Allowable limit for the combined uncertainty of manufacturer's commercial calibrators @ 50% of the goal on patient result**

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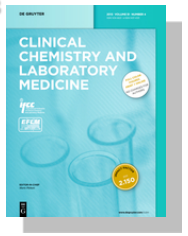
Opinion Paper

Clin Chem Lab Med 2013; 51:973

Renze Bais*, Dave Armbruster, Rob T. P. Jansen, George Klee, Mauro Panteghini, Joseph Passarelli and Ken A. Sikaris on behalf of the IFCC Working Group on Allowable Error for Traceable Results (WG-AETR)

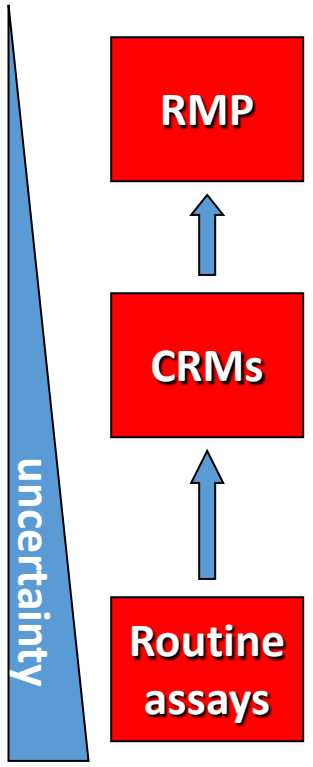
Defining acceptable limits for the metrological traceability of specific measurands



Specifications of reference measurement procedure defined by intended use…

…intended use is the certification of reference materials…

…the specifications of certified reference materials are defined by the performance needs of the clinical assays.



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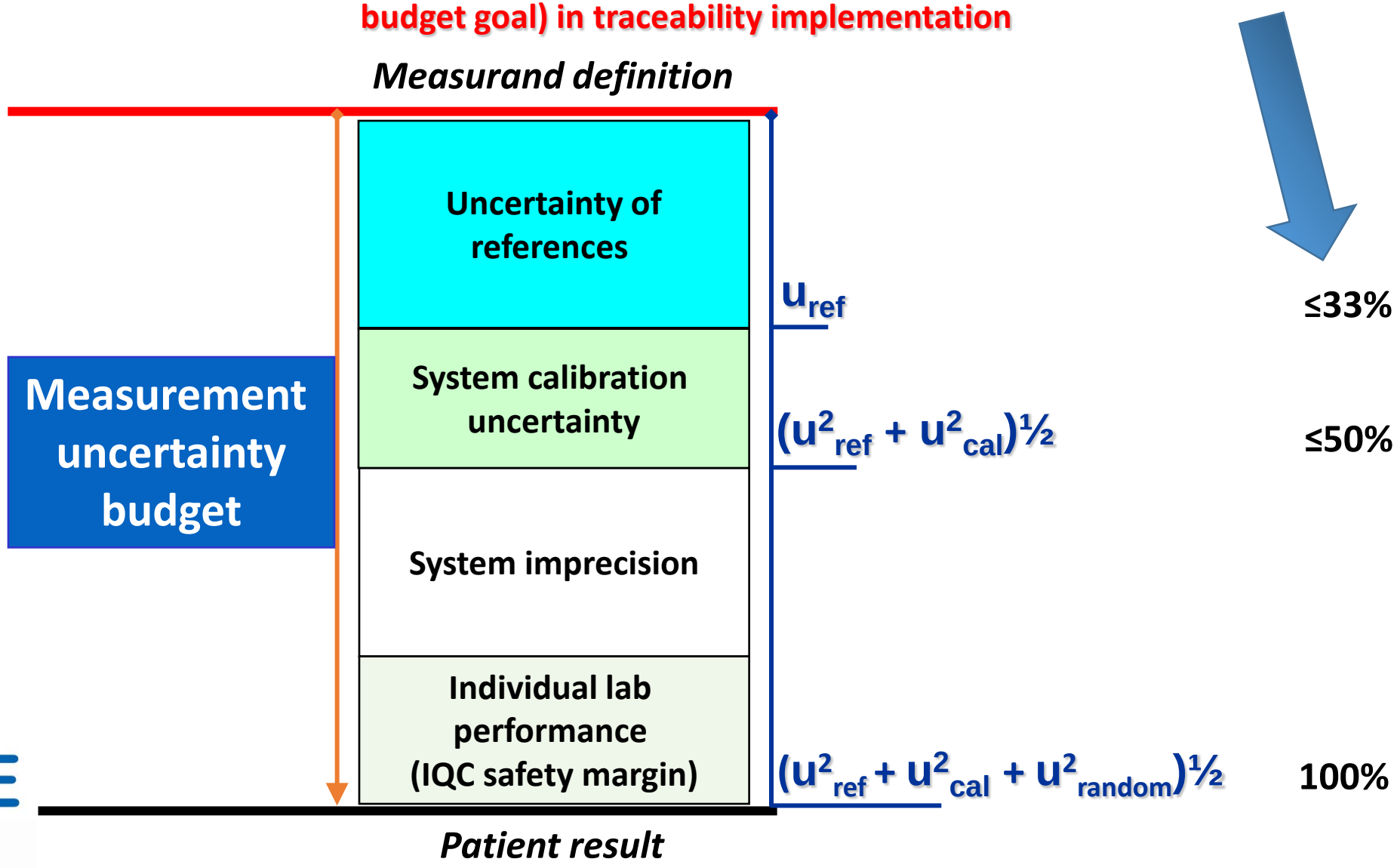
Adapted from D. Bunk - 5th CIRME International Scientific Meeting
Milano - 30 November 2011

Recommended limits for combined uncertainty budget (expressed as percentage of total budget goal) in traceability implementation



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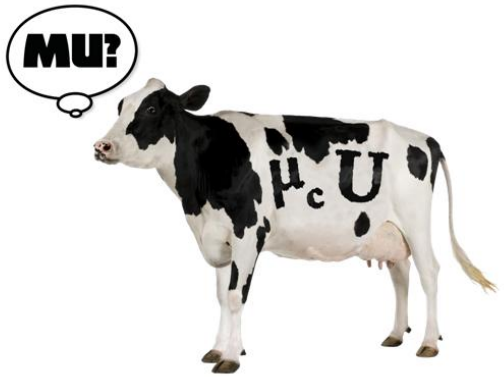
Braga F et al. Clin Chem Lab Med 2015;53:905



This approach should be applied to every analyte measured in the clinical laboratory in order to establish if the current status of the uncertainty budget of its measurement associated with the proposed metrological traceability chain is suitable for clinical application of the test.

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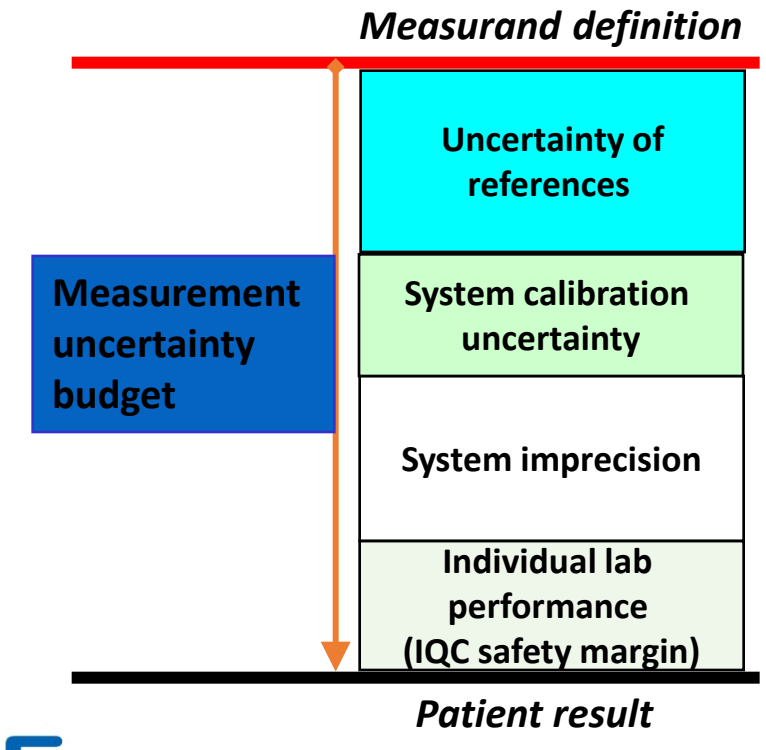
Panteghini M, Clin Chem Lab Med 2012;50:1237

IFCC WG-TNI Technical Discussion
Value Assignment of NIST SRM 2922 and measurement uncertainty



≤33% of uncertainty budget due to SRM uncertainty (~4.5%).

Anticipate 50% of uncertainty budget (6.5%) at manufacturer's calibration and value transfer level.

According to the outcome-based study of misclassification rates, the maximum allowable goal for 100% total uncertainty budget of cTnI assays is 13% (minimum quality goal) for the clinical result and which allows for <2% result misclassification.

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"THE TRACEABILITY REVOLUTION MANIFESTO"

Braga F & Panteghini M, Clin Chim Acta 2014;432:55

- Definition and approval of reference measurement systems, possibly in their entirety;
- Implementation by IVD industry of traceability to such reference systems in a scientifically sound and transparent way;
- Definition by the profession of the clinically acceptable measurement uncertainty (error) for each of the analytes used in the clinical field;
- Adoption by EQAS providers of commutable materials and use of an evaluation approach exclusively based on trueness;
- Monitoring of the analytical performance of individual laboratories by the participation in EQAS that meet metrological criteria and application of clinically acceptable limits;
- Abandonment by users (and consequently by industry) of nonspecific methods and/or of assays with demonstrated insufficient quality.

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The three most highly cited CIRME papers

Mini-Review

Clin Biochem Rev Vol 28 August 2007 I 97

Traceability, Reference Systems and Result Comparability

Mauro Panteghini
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Available online at www.sciencedirect.com
ScienceDirect
Clinical Biochemistry 42 (2009) 236–240

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Traceability as a unique tool to improve standardization in laboratory medicine

Mauro Panteghini *

Centre for Metrological Traceability in Laboratory Medicine (CIRME), University of Milan, Milan, Italy

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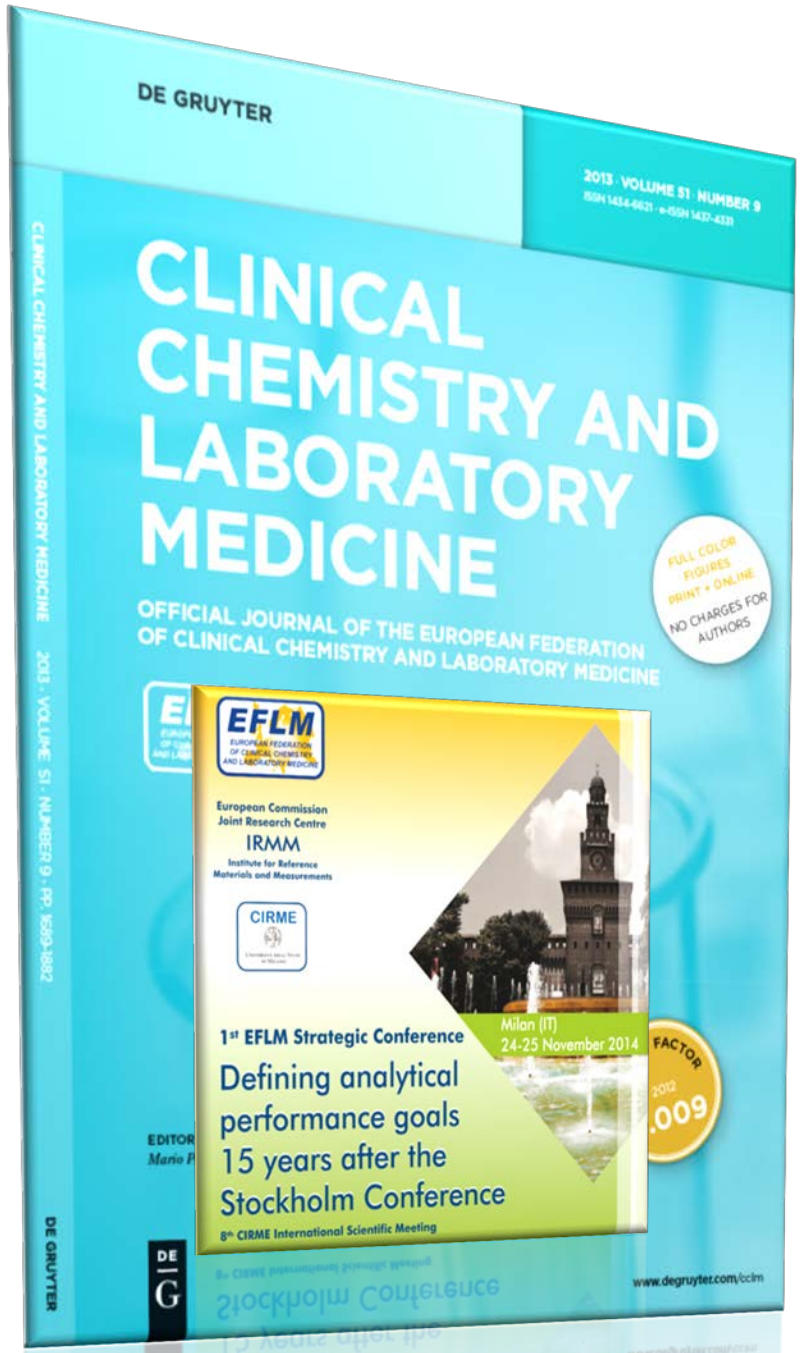
Clin Chem Lab Med 2010;48(1):7–10 © 2010 by Walter de Gruyter • Berlin • New York. DOI 10.1515/CCLM.2010.020

Editorial

Application of traceability concepts to analytical quality control may reconcile total error with uncertainty of measurement

Mauro Panteghini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Defining analytical performance goals 15 years after the Stockholm Conference
8th CIRME International Scientific Meeting
Milan (IT)
24-25 November 2014
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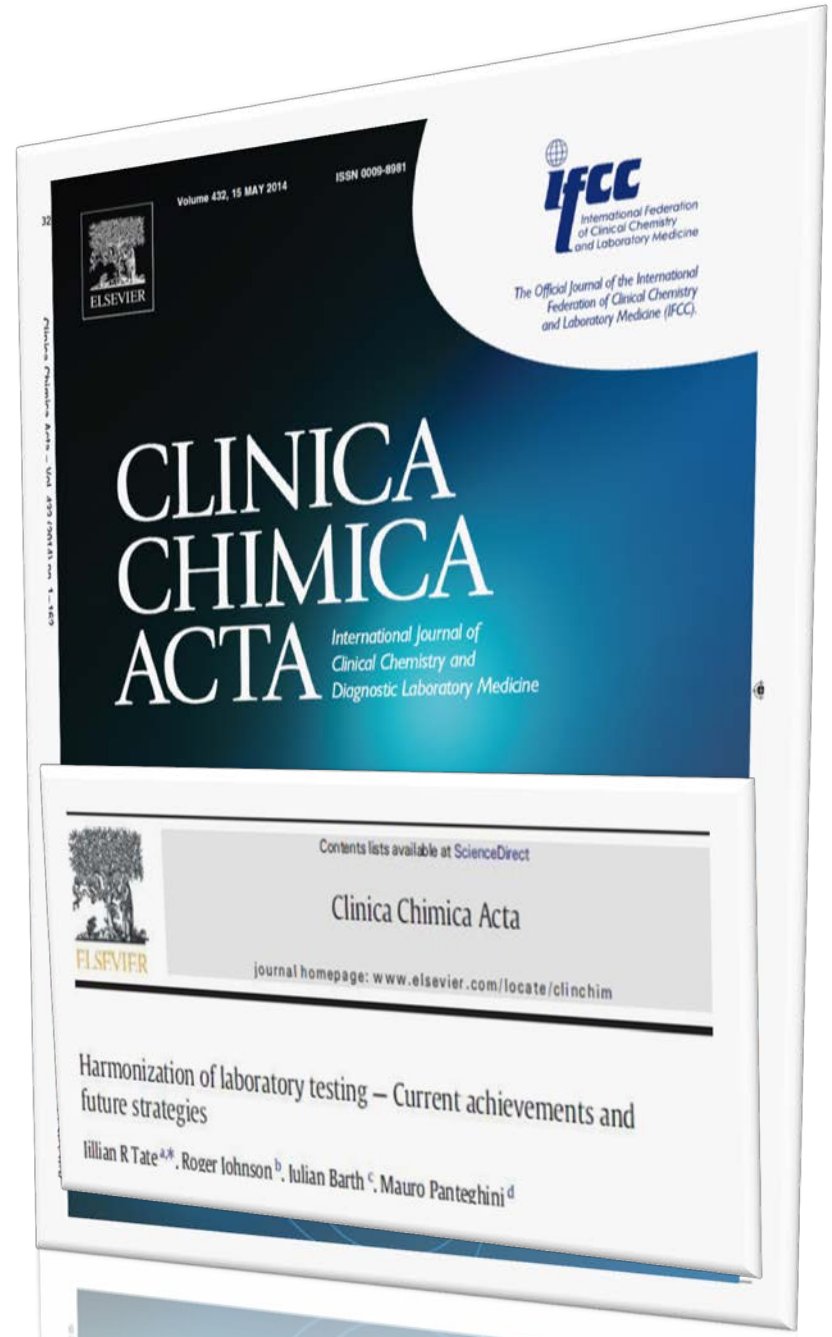
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Harmonization of laboratory testing – Current achievements and future strategies
Jillian R Tate, Roger Johnson, Julian Barth, Mauro Panteghini

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Calibration Laboratory

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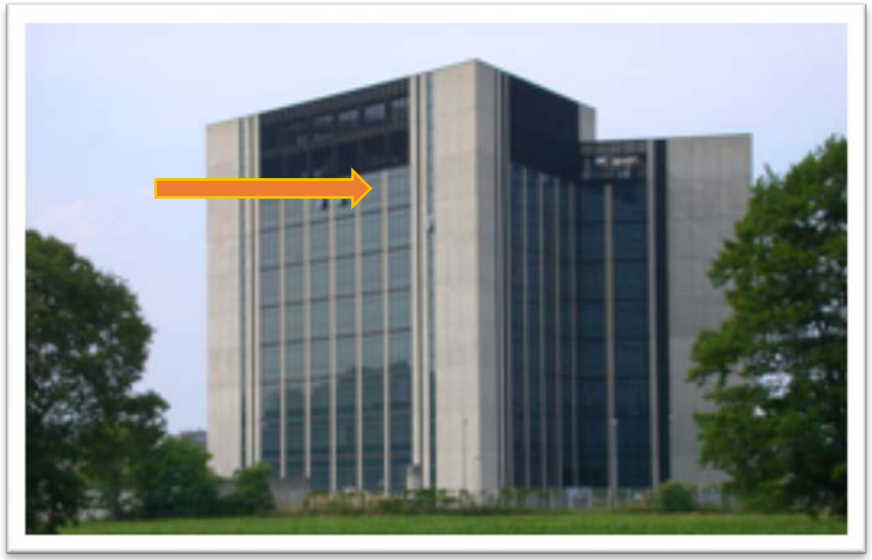

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