



Roma, 9-12 novembre 2017



ITALIAN CHAPTER



Criticità per il laboratorio

Mariarosa Carta

Laboratorio Analisi Ospedale S. Bortolo, Vicenza



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Conflitti di interesse



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Ai sensi dell'art. 3.3 sul conflitto di interessi, pag 17 del Regolamento Applicativo Stato-Regioni del 5/11/2009, dichiaro che negli ultimi 2 anni ho avuto rapporti diretti di finanziamento con i seguenti soggetti portatori di interessi commerciali in campo sanitario: STAGO



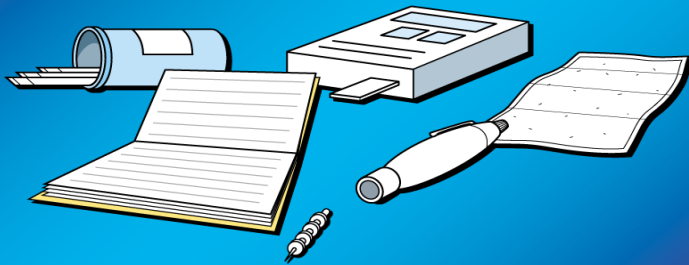
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*“Il diabete è una malattia cardiovascolare
che si diagnostica misurando la glicemia”*



“Esame delle urine”, miniatura da Aicenna “Canon di Medicina”, xv sec. Bologna, Biblioteca Universitaria.



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Clinical Chemistry

1832

Clinical Chemistry 53: 2040–2041, 2007; 10.1373/clinchem.2007.094466
(*Clinical Chemistry*. 2007;53:2040–2041.)

© 2007 American Association for Clinical Chemistry, Inc.

Opinion

Glucose: A Simple Molecule That Is Not Simple to Quantify

Raymond Gambino

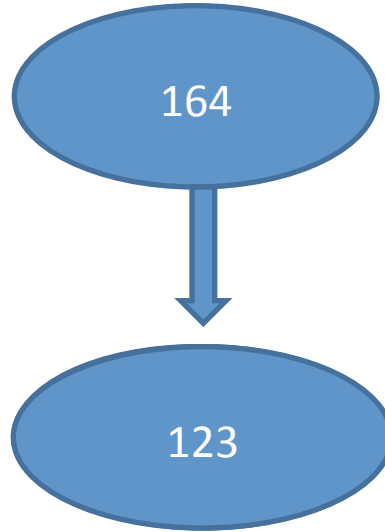


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Controllo dopo terapia



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La variabilità del glucosio



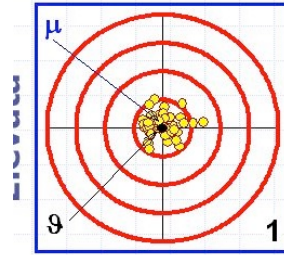
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Variabilità
biologica

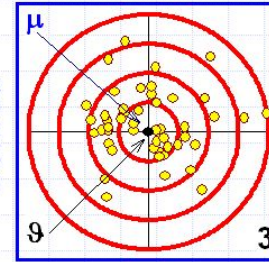
5,5%

elevata



Variabilità
analitica

Scarsa



Specifiche di qualità: $CV_a < 1/2$ $CV_i < 2,2\%$



Imprecisione analitica



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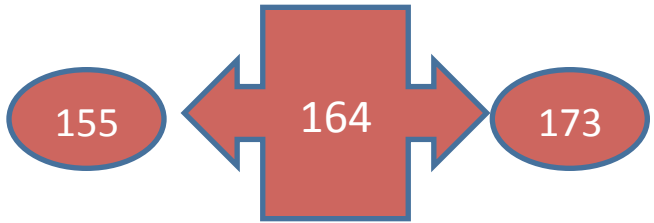
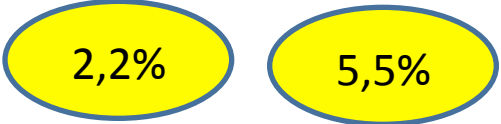
glicemia	63,7	239,27	80,39	55,05	80,33
CV esochinasi	2,06%	1,68%	2,62%	2,22%	1,97%
CV glucosio-ossidasi	2,6%	1,7%	2,25%	3,05%	2,25%



La variabilità del glucosio



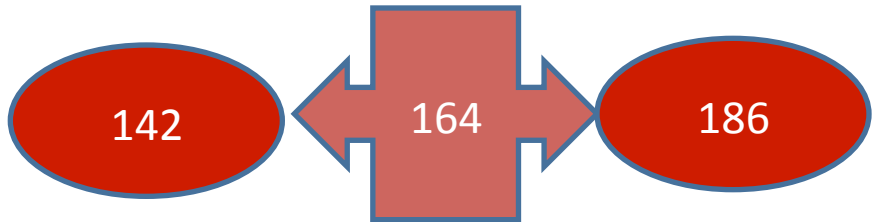
$$CV_t = (CV_a^2 + CV_i^2)^{1/2}$$



- Glu A
- Glu B

Differenza critica = $(2 \times (CV_a^2 + CV_i^2))^{1/2} \times Z$

$2,77 \times (2^2 + 5,5^2)^{1/2} = 13,8\%$



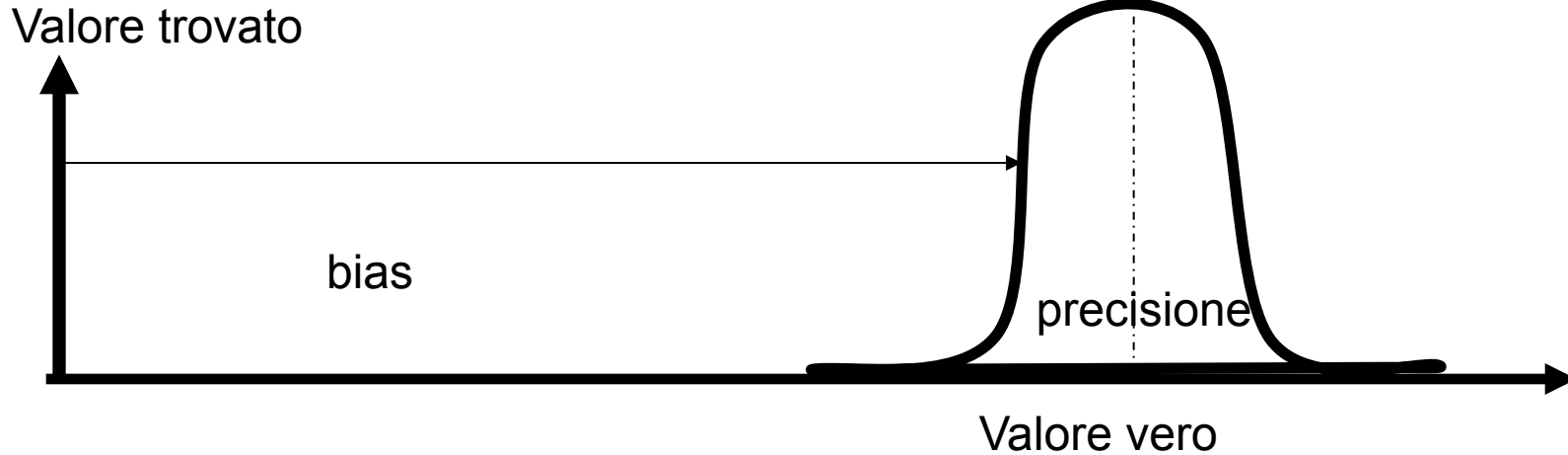


Accuratezza del metodo



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Specifiche di qualità: $\text{bias}\% < 0,25(\text{CVi}^2 + \text{CVg}^2)^{1/2} < 1,8\%$

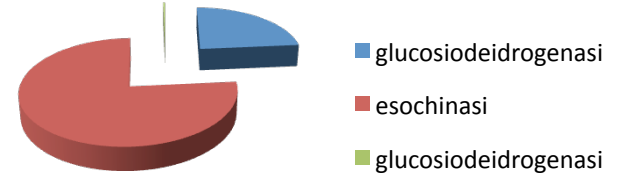
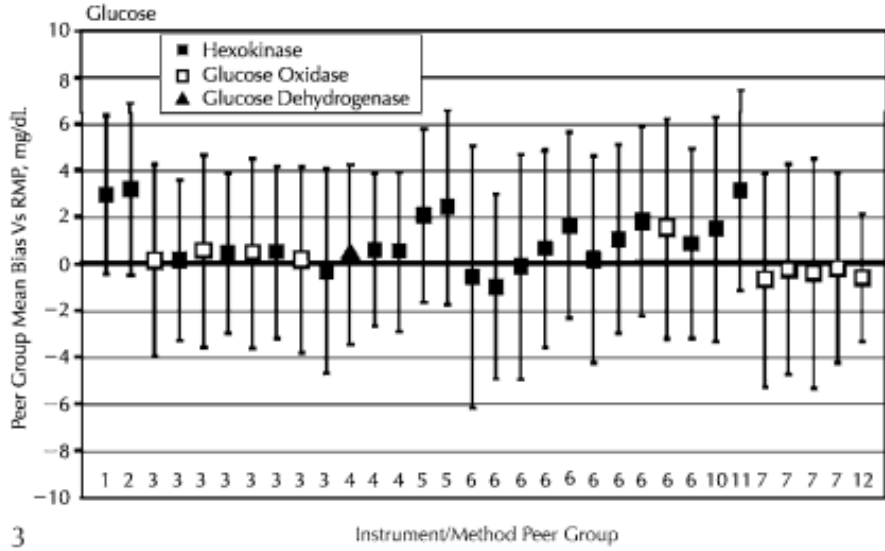


II bias



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Laboratorio affidabile?





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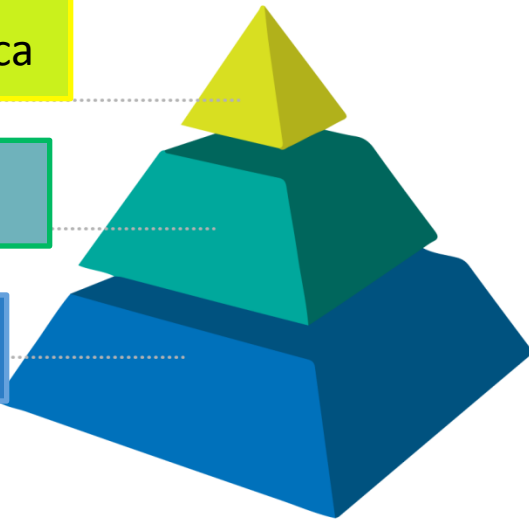


Variabilità pre-analitica

Post-analitica

Analitica-

Pre-analitica



Va in un punto prelievi lontano dal laboratorio



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- Esegue il prelievo alle 7
- La provetta viene posizionata sul bancone, tenuta a T.A. e portata in laboratorio alle 10
- Viene accettata e centrifugata alle 11



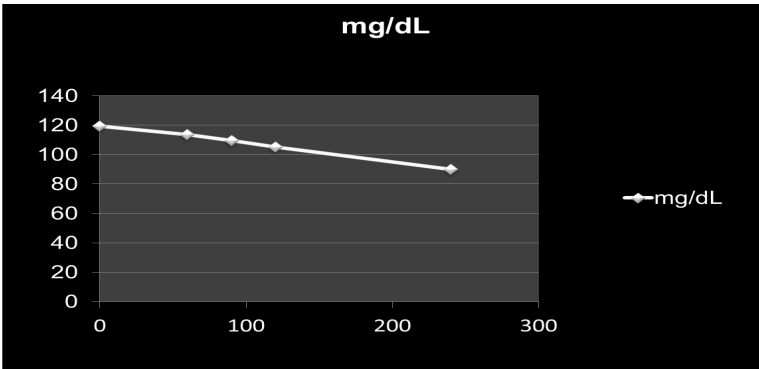
Passano 4 h



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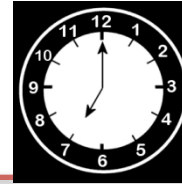
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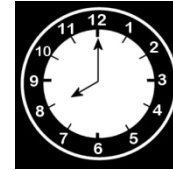
La glicolisi provoca un decremento della glicemia intorno al 7%/ora

Chan, 1989

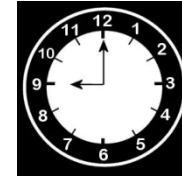
164



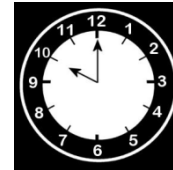
153



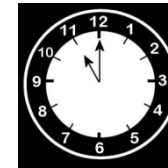
142



132



123





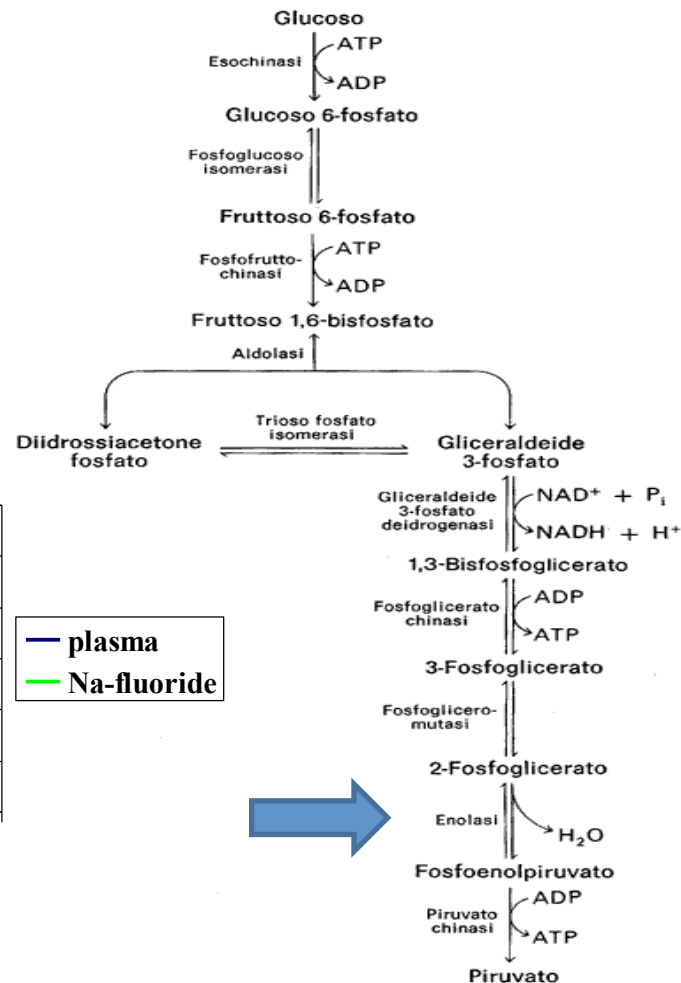
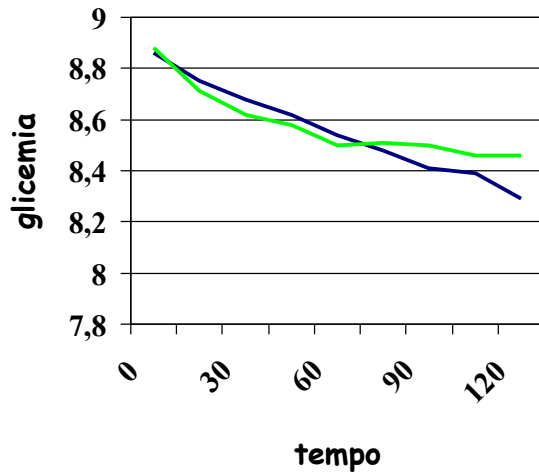
Full Text (PDF)

POTASSIUM FLUORID AS A PRESERVATIVE FOR BLOOD

J Am Med Assoc. 1923;81(23):1952.

- Plasma should be separated from the cells within 60 min; if this is not possible, a tube containing a glycolytic inhibitor such as sodium fluoride should be used for collecting the sample.

2002





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Clinical Chemistry

R. Gambino, J. Piscitelli, T. A. Ackattupathil, J. L. Theriault, R. D. Andrin, Sanfilippo, and M. Etienne

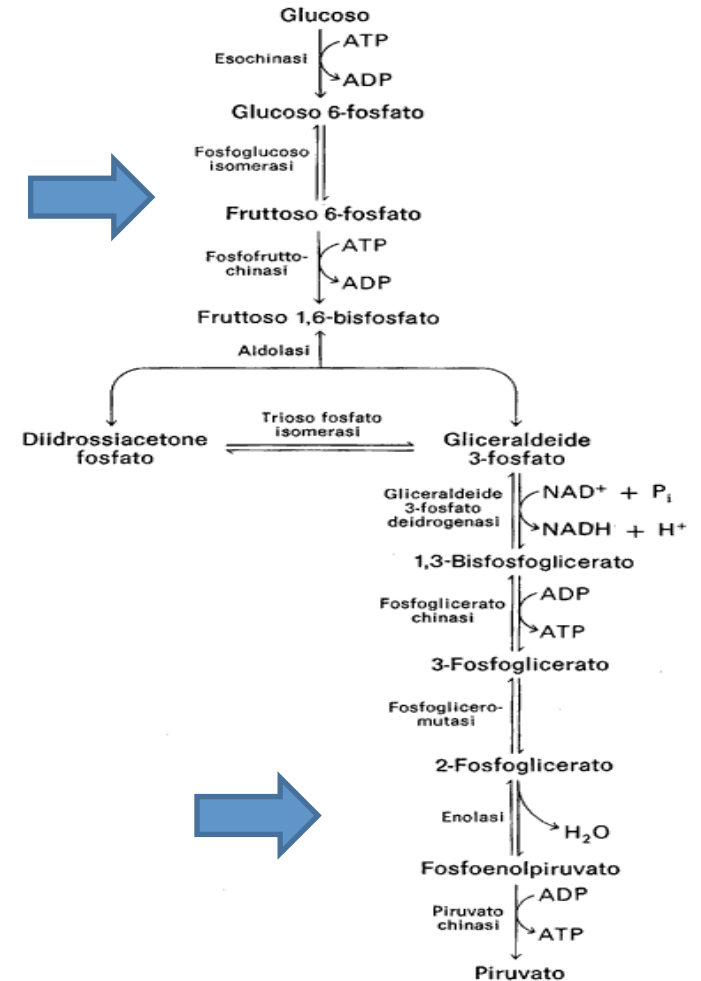
Acidification of Blood Is Superior to Sodium Fluoride Alone as Inhibitor of Glycolysis

Clin. Chem., May 1, 2009; 55(5): 1019 – 1021.

RECOMMENDATION: TO MINIMIZE GLYCOLYSIS, ONE SHOULD PLACE THE SAMPLE TUBE IMMEDIATELY IN AN ICE-WATER SLURRY, AND THE PLASMA SHOULD BE SEPARATED FROM THE CELLS WITHIN 30 MIN. IF THAT CANNOT BE ACHIEVED, A TUBE CONTAINING A RAPIDLY EFFECTIVE GLYCOLYSIS INHIBITOR, SUCH AS CITRATE BUFFER, SHOULD BE USED FOR COLLECTING THE SAMPLE. TUBES WITH ONLY ENOLASE INHIBITORS, SUCH AS SODIUM FLUORIDE, SHOULD NOT BE RELIED ON TO PREVENT GLYCOLYSIS B (moderate).



2011





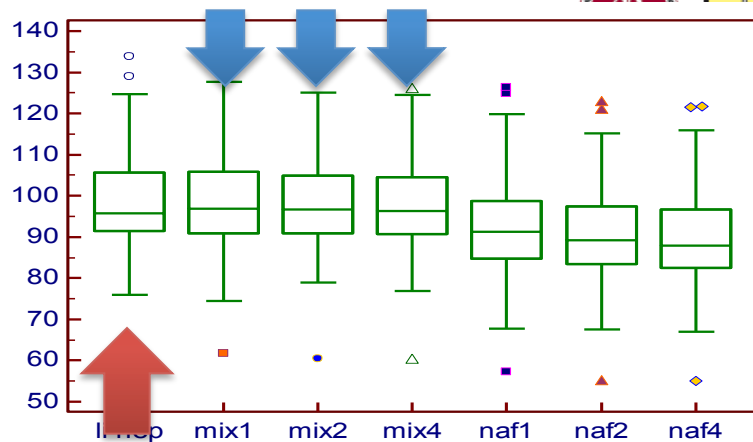
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[Biochem Med \(Zagreb\)](#). 2016;26(1):68-76. doi: 10.11613/BM.2016.006.

Effectiveness of citrate buffer-fluoride mixture in Terumo tubes in vitro glycolysis.

[Bonetti G](#)¹, [Carta M](#)², [Montagnana M](#)³, [Lo Cascio C](#)⁴, [Bonfigli AR](#)⁵, [Mosca A](#)⁶, [Testa R](#)⁷; [Italian J of Diabetes Mellitus](#).

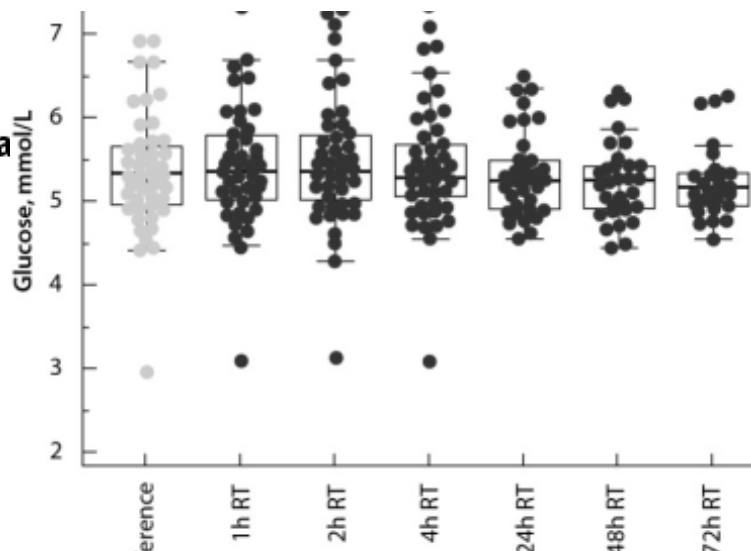
[+ Author information](#)



[Biochem Med \(Zagreb\)](#). 2017 Oct 15;27(3):030901. doi: 10.11613/BM.2017.030901. Epub 2017 Aug 28.

The new Greiner FC-Mix tubes equal the old Terumo ones a glucose stabilizer after prolonged storage of samples.

[Bonetti G](#)¹, [Carta M](#)².



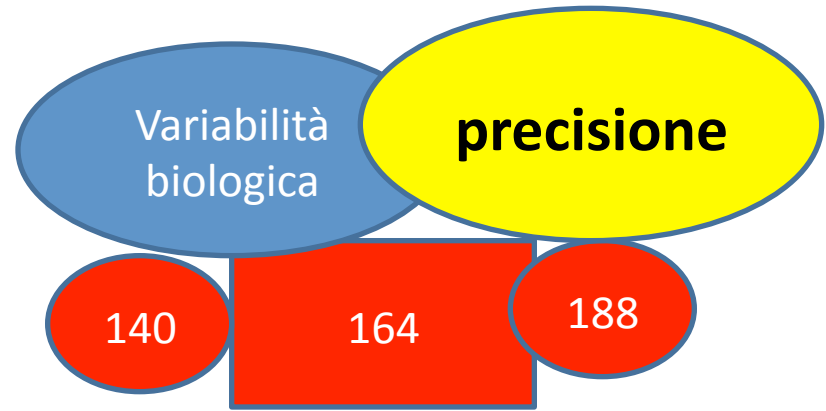
Specifiche di qualità per i glucometri: nel 95% delle determinazioni il glucosio deve essere $\pm 15\%$ rispetto al glucosio di riferimento



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ISO 15197:2013





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Grazie per
l'attenzione

