



A Visão dos Profissionais de Saúde sobre o Uso dos Glicosímetros e os Riscos Associados

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Papiro de Ebers – 1550 AC



Dhanvantari

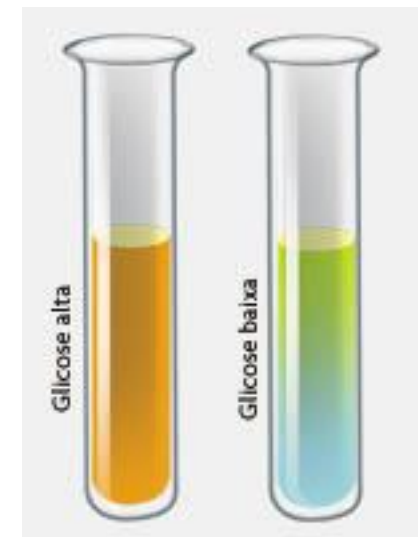


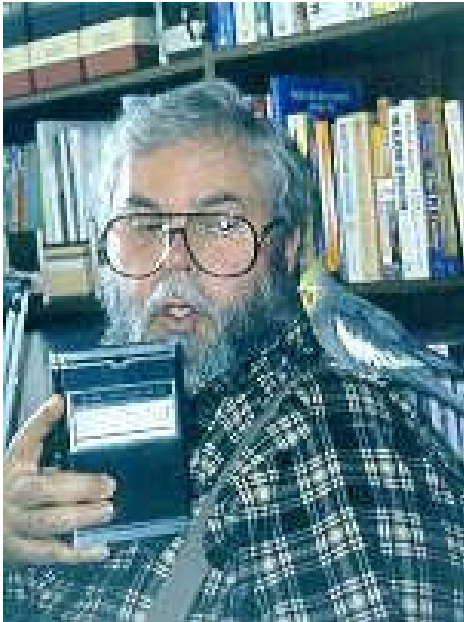
Primeiro Glicosímetro

1670



Pesquisa de Glicosúria





David Mendosa
<http://www.mendosa.com/>

Patente:
 Solicitada em 1968
 Concedida em 1971

Ames Reflectance Meter



Inventor: Tom Clemens
 Primeiro paciente: Dick Bernstein
 Marketing expert: Charlie Suther

United States Patent (11) 3,604,815

[72] Inventor:	Anton Hubert Clemens Elkhart, Ind.	3,039,353	6/1962	Coates et al.	356/51 X
[21] Appl. No.	723,102	3,062,092	11/1962	Schmidt	356/226 UX
[22] Filed	Apr. 22, 1968	3,147,680	9/1964	Stinson	356/226 X
[45] Patented	Sept. 14, 1971	3,340,764	9/1967	Bergson	356/177
[73] Assignee	Miles Laboratories, Inc. Elkhart, Ind.	3,445,170	5/1969	Dietrich et al.	356/226
		3,215,843	11/1965	Neil	250/205

FOREIGN PATENTS

		755,725	8/1956	Great Britain	356/212
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[54] REFLECTANCE METER
 4 Claims, 4 Drawing Figs.

[52] U.S. Cl. 356/191,
 250/210, 356/195, 356/212, 356/226

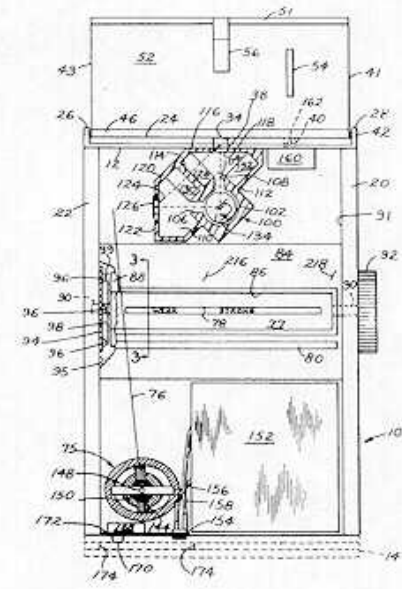
[51] Int. Cl. G01j 3/52,
 G01j 3/46, G01n 21/48

[50] Field of Search 356/22,
 212, 226, 177, 176, 179, 186, 195; 250/210

[56] References Cited
 UNITED STATES PATENTS

2,739,246	3/1956	Hunter	356/212
2,774,276	12/1956	Glasser et al.	356/176

ABSTRACT: A small, portable photoelectric cell-type reflectance meter is described for use in measuring color reflectance values of analytical test devices. Since these analytical test devices have predetermined ranges of color reflectance values, the reflectance meter is preset to read color values within these ranges. The meter has a constant light output circuit, a regulated power supply based on battery power and a battery power check circuit.





DIRECTIONS:

- **Must be followed exactly.** Freely apply a large drop of capillary or venous blood sufficient to cover entire reagent area on printed side of strip.
- Wait **exactly 60 seconds.** (Use sweep second hand or stopwatch for timing.)
- Quickly wash off blood (in 1 or 2 seconds) with a sharp stream of water, using a wash bottle and blot **once** gently on a lint-free paper towel.
- Read result within **1 or 2 seconds** after washing. Hold the strip close to the Color Chart. Interpolate if necessary.
- **NOTE:** For quantitative measurement of blood glucose, use DEXTROSTIX with specified Ames brand reflectance photometers.



Primeiro modelo prático



Primeiro modelo com memória

Falantes

Menores

Médias: 7, 14
e 30 dias

Registro pré e
pós-prandial



43
modelos
(USA)

Locais
alternativos

Contínuos

5 segundos

Microlancetas

0,3 μ L

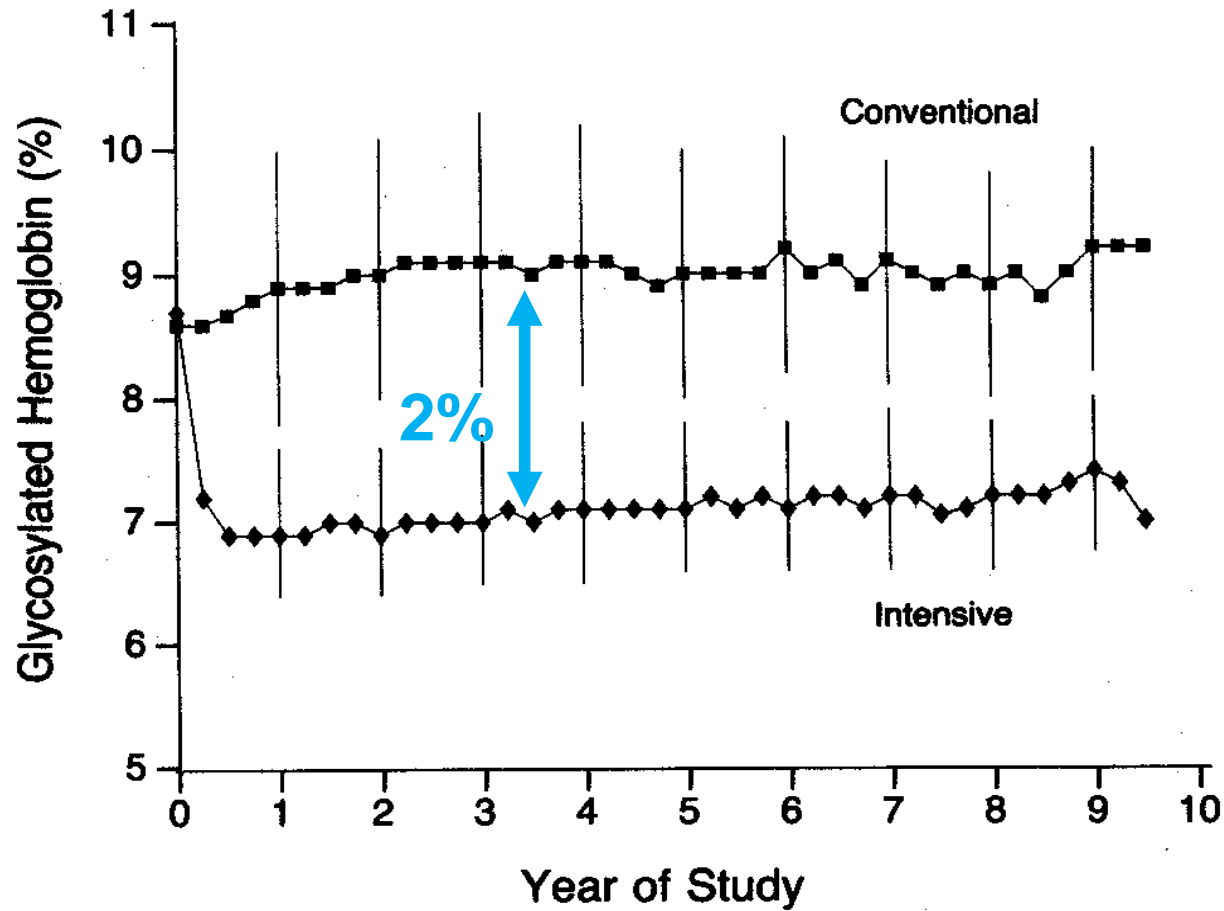
DCCT

Diabetes Control and Complications Trial

- 1441 voluntários com Diabetes tipo 1
- Mais de um ano e menos de 15 anos de doença
- 29 centros nos EUA e Canadá
- Entre 1983 e 1993
- Randomizados para
 - Controle intensivo
 - Monitorização frequente da glicemia capilar
 - No mínimo 3 aplicações de insulina/dia ou bomba de infusão
 - Terapia convencional
 - Uma ou duas aplicações de insulina/dia

DCCT

Diabetes Control and Complications Trial



DCCT

Diabetes Control and Complications Trial

Retinopatia

- Pacientes sem retinopatia inicialmente: redução de risco de 76%.
- Pacientes com retinopatia moderada: redução da progressão de 54%; redução do aparecimento de retinopatia grave não proliferativa de 47%

Albuminuria

- Redução da microalbuminúria (40 mg/day) em 39%.
- Redução da albuminúria (300 mg/day) em 54%.

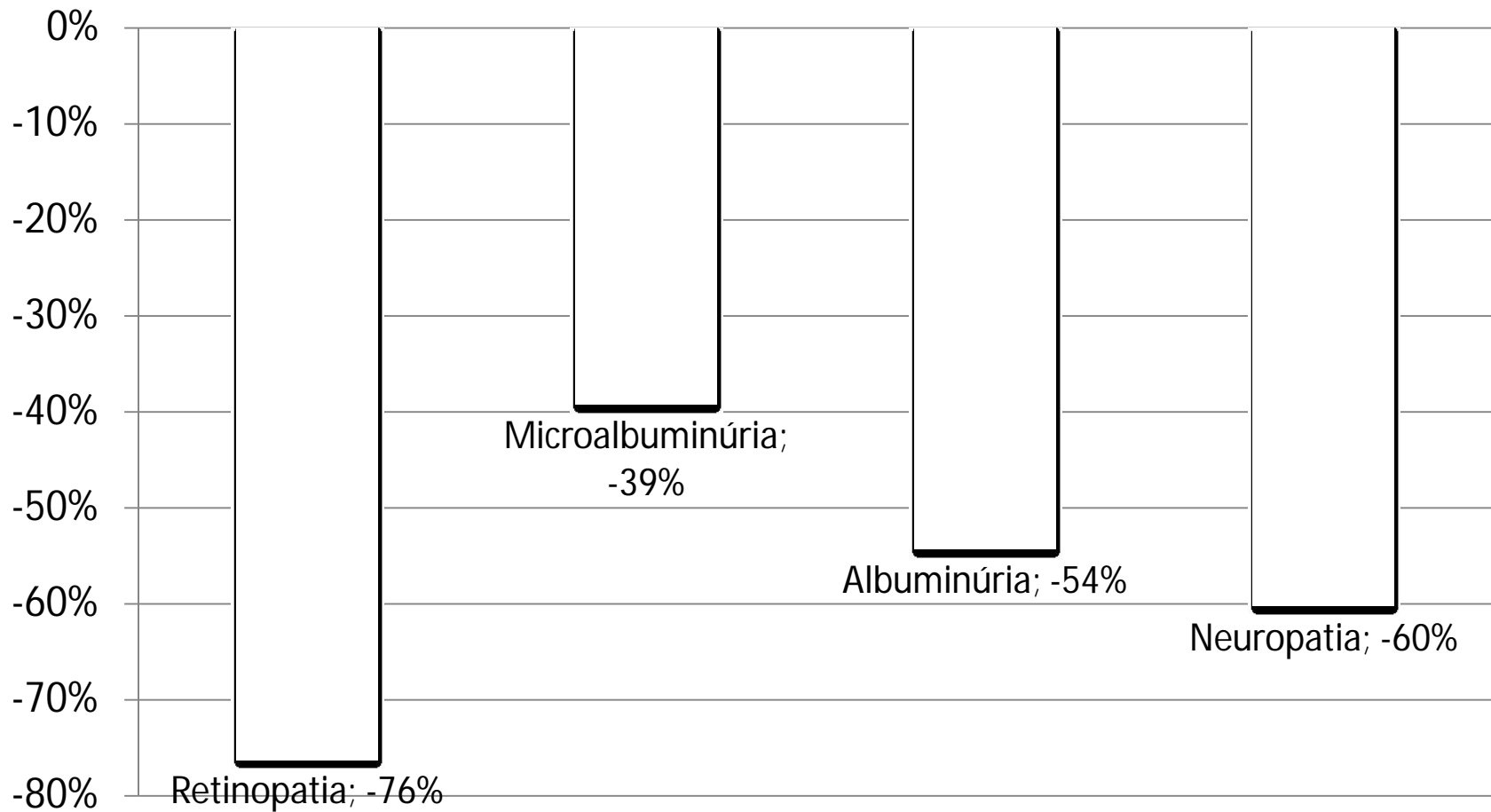
Neuropatia

- Redução da neuropatia em 60%.
- Redução da condução nervosa anormal em 44%.
- Redução da função de sistema nervoso autônomo anormal em 53%.
- As velocidades de condução nervosa permaneceram estáveis com controle intensivo mas diminuíram com a terapia convencional

Hipoglicemia grave

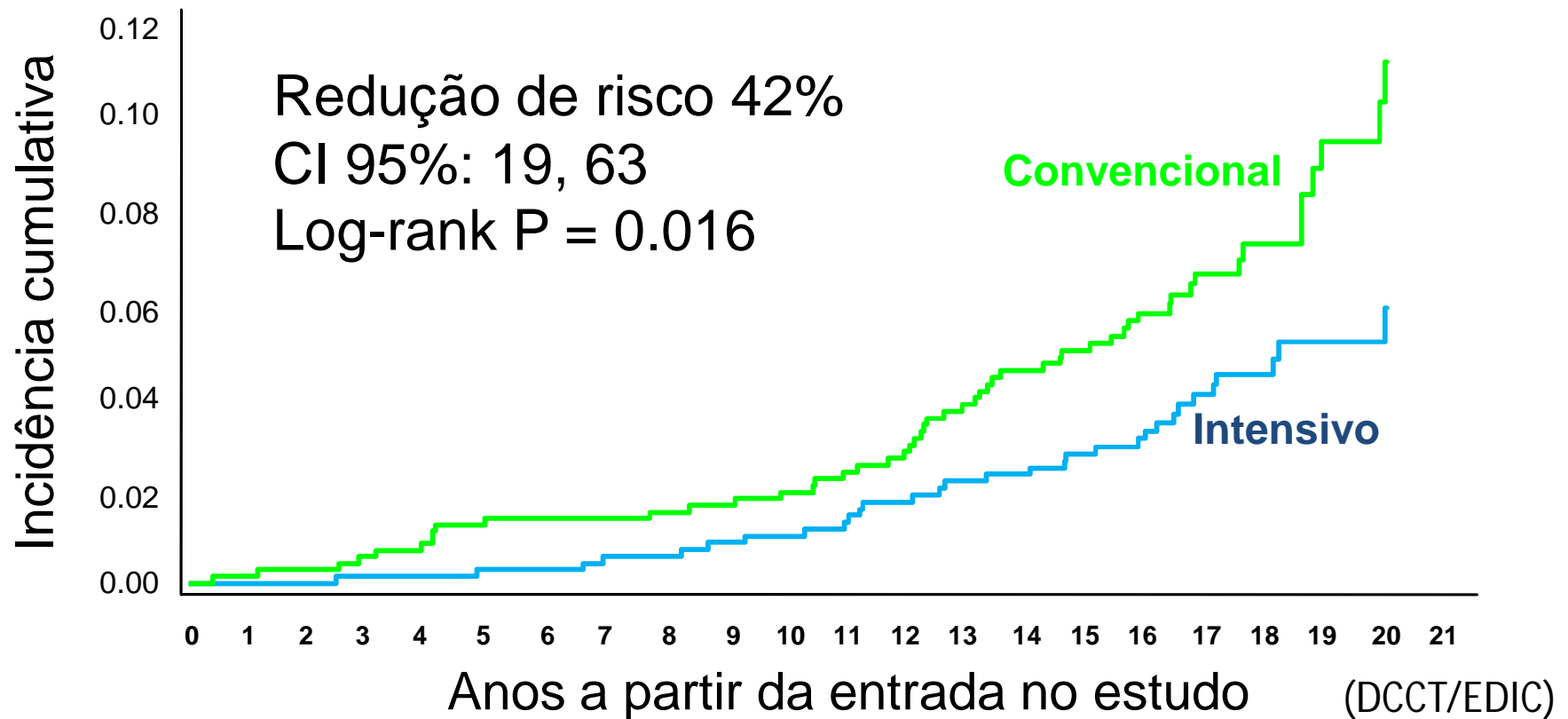
- O principal efeito adverso associado com o controle intensivo foi um aumento de 200% a 300% de episódios de hipoglicemia grave.

DCCT: redução de complicações no grupo com controle intensivo



Eventos Cardiovasculares

Incidência cumulativa do primeiro evento



Correspondência entre níveis de HbA1C e níveis médios de glicemia

Nível de HbA1C	Níveis médios de glicemia (DAG)
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A hemoglobina glicada é o padrão ouro para a avaliação do controle glicêmico, porém:

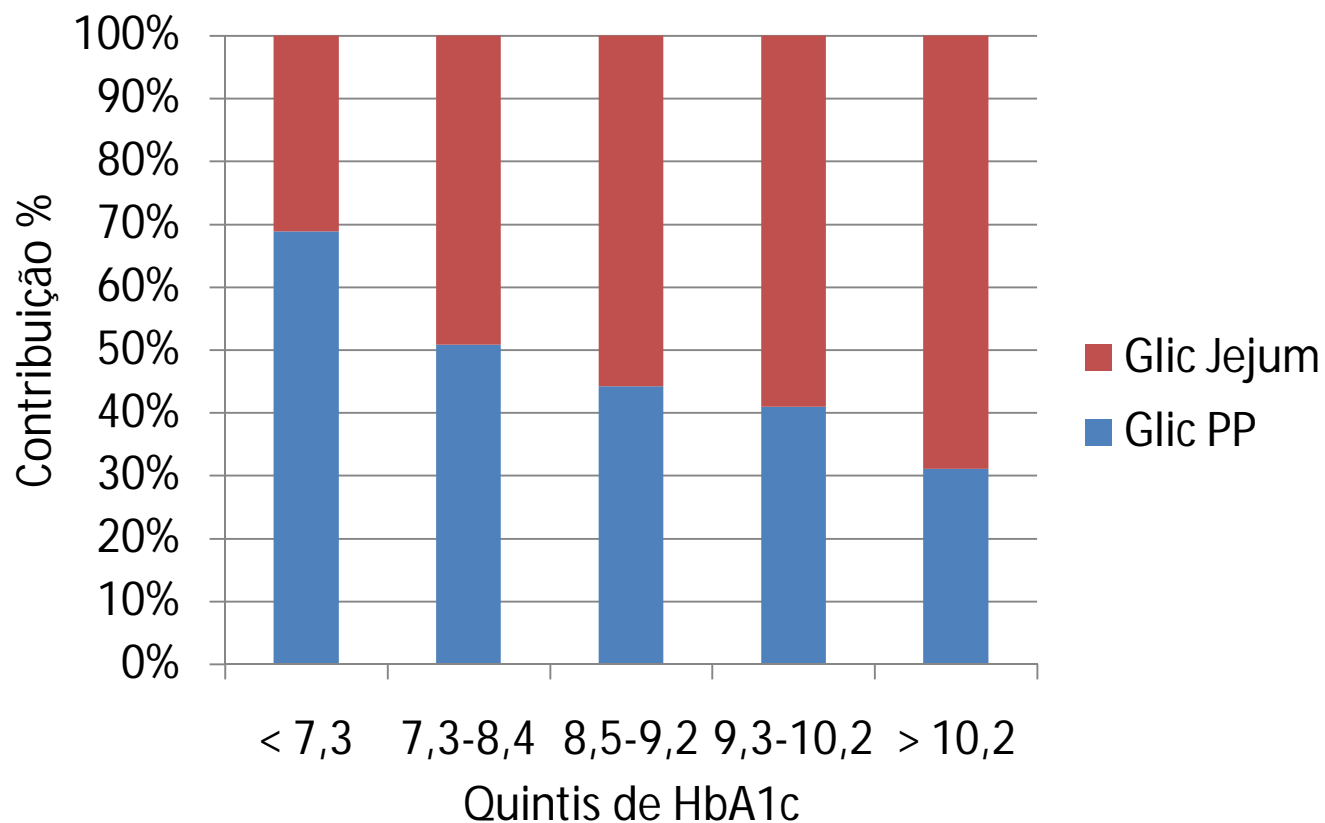
- Não avalia em que horários do dia intervir no tratamento
- Não mede a variabilidade glicêmica

Glicose média estimada (mg/dL) = 28,7 x A1C - 46,7

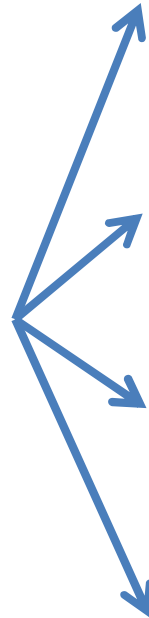
Calculadora automática link:

<http://www.diabetes.com.br/calculadoras/glicemia-media-estimada>

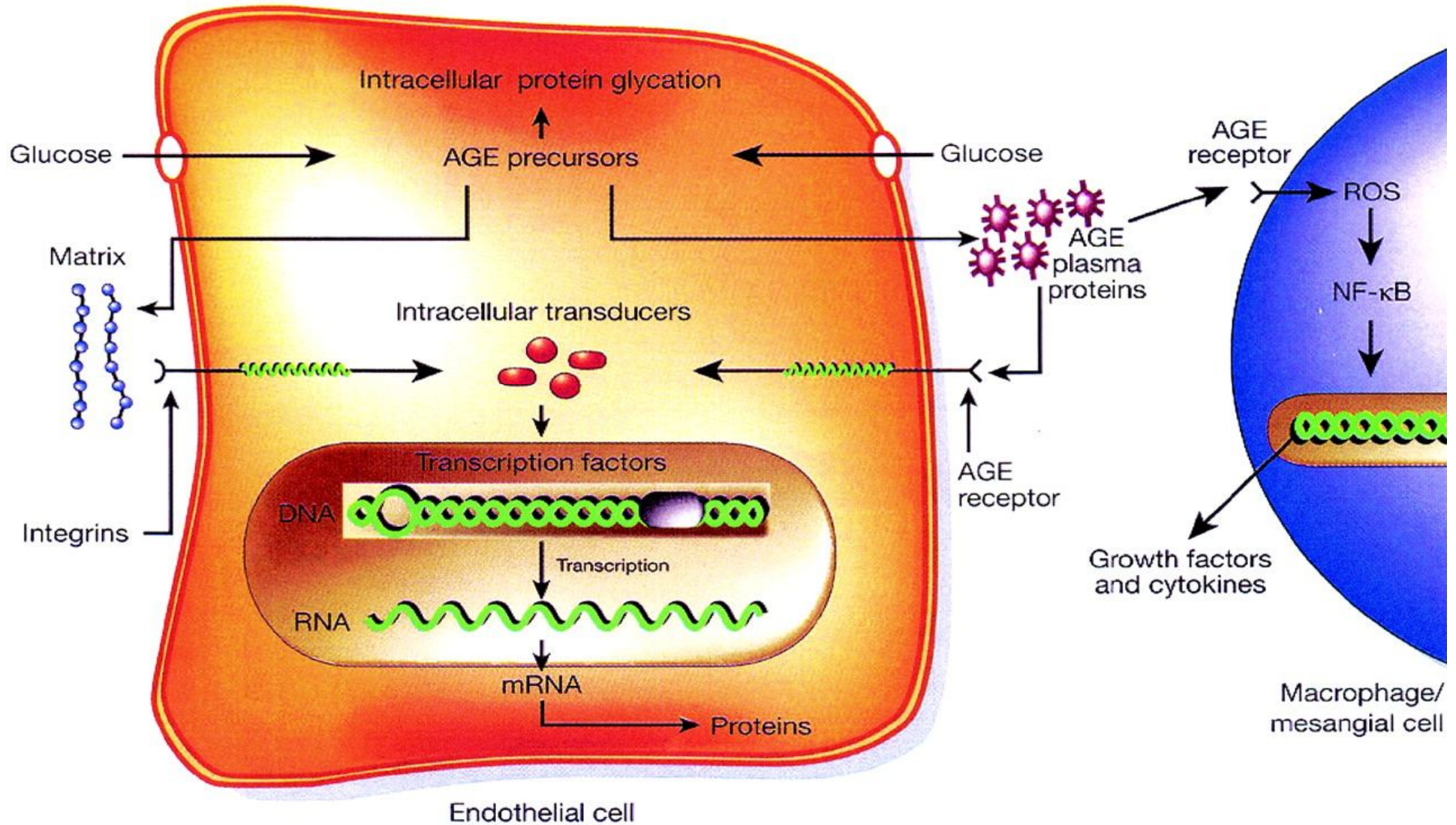
Contribuição da glicemia de jejum e pós-prandial para a HbA1c no DM2



Produtos Finais da Glicação Avançada (Advanced Glycation End Products)



The pathobiology of diabetic complications: a unifying mechanism.



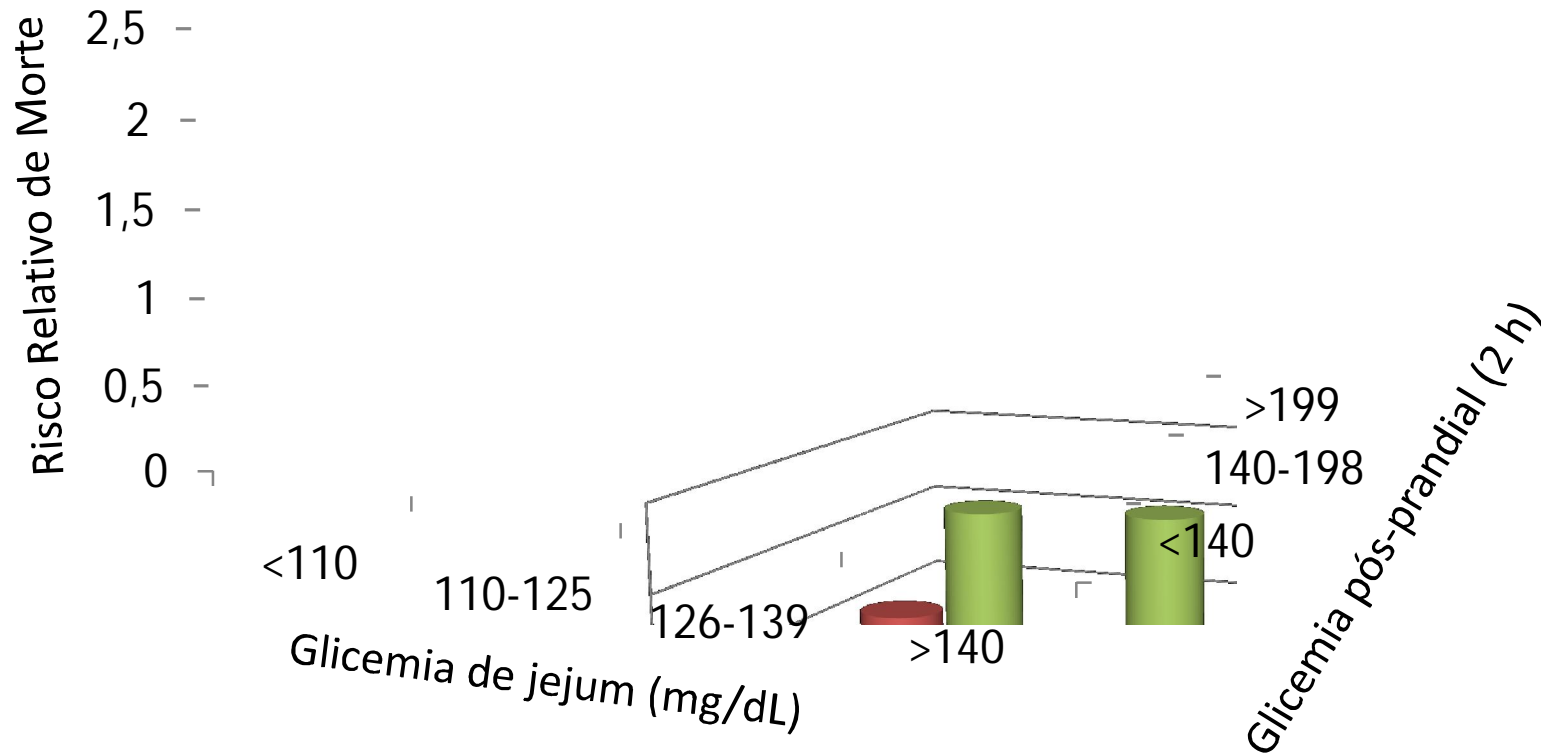
Glicemia pós-prandial e risco cardiovascular

Table 1 Association between postprandial glucose values and the risk of cardiovascular heart disease (CHD) across the spectrum of glucose tolerance

Study	Characteristics	Cardiovascular outcomes
Honolulu Heart Program [9]	6005 men 45–70 years 12 years' follow-up	CHD incidence and mortality increase stepwise with increasing 1-h postchallenge glucose
DECODE Study Group [8]	18 408 men 7316 women 13 European centres 28 years' follow-up	CHD mortality is more related to 2-h post meal glucose than fasting plasma glucose
Whitehall, Paris Prospective and Helsinki Policeman Studies [13]	17 285 men 44–55 years 20 years' follow-up	Men in upper 2.5% of 2-h post meal glucose distribution had significantly higher CHD mortality
Hoorn Study [12]	2363 subjects 50–75 years 8 years' follow-up	High plasma glucose levels especially 2-h post load glucose concentrations and to a lesser degree HbA _{1c} values indicate a risk of CHD mortality
Diabetes Intervention Study [11]	1139 subjects with type 2 diabetes 30–55 years 11 years' follow-up	1-h post-breakfast blood glucose, but not fasting blood glucose, was associated with higher rates of MI and death

Estudo DECODE

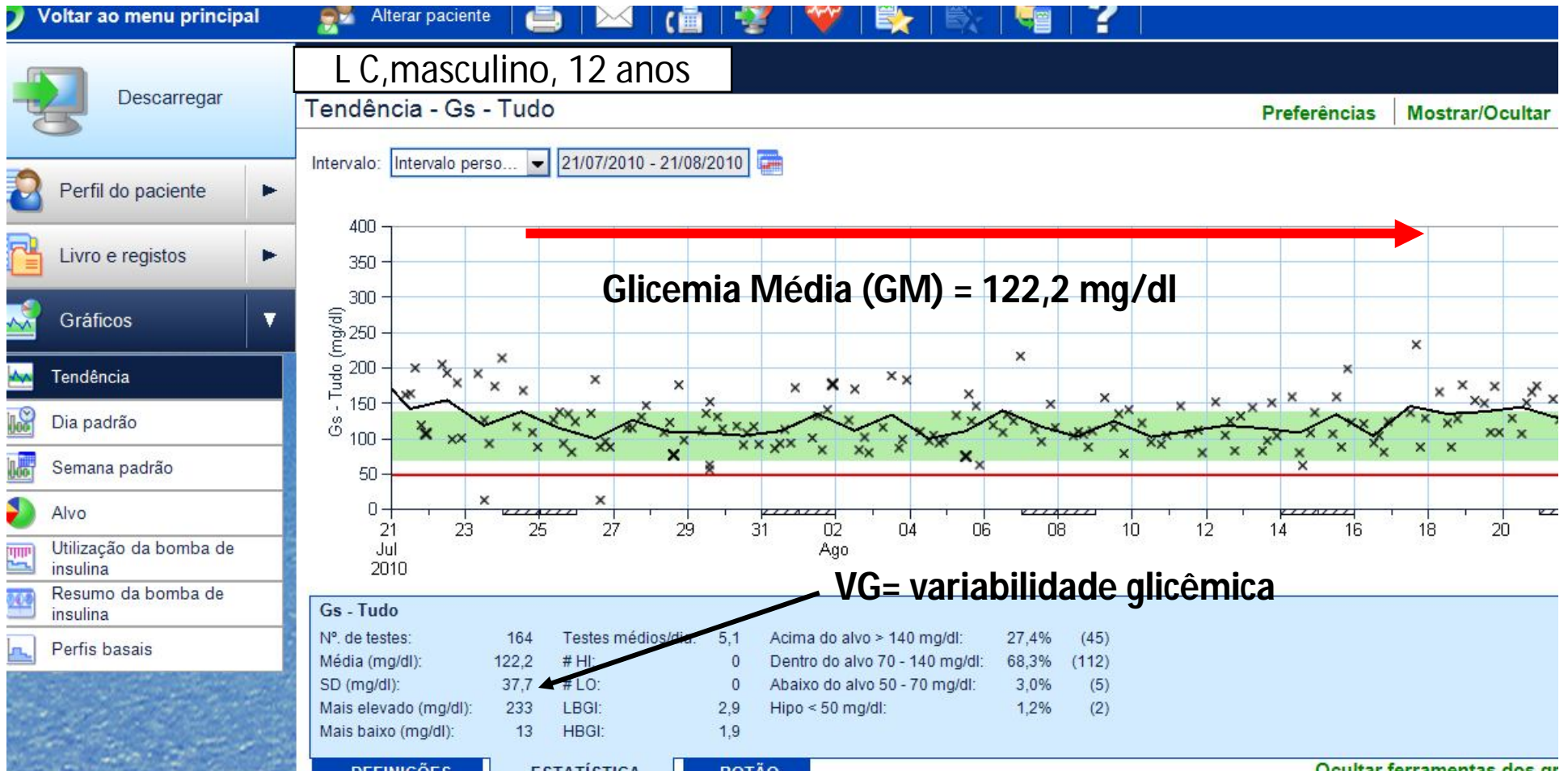
Risco relativo de morte por todas as causas, ajustado para idade e sexo



The DECODE study group. Lancet 1999;354:617

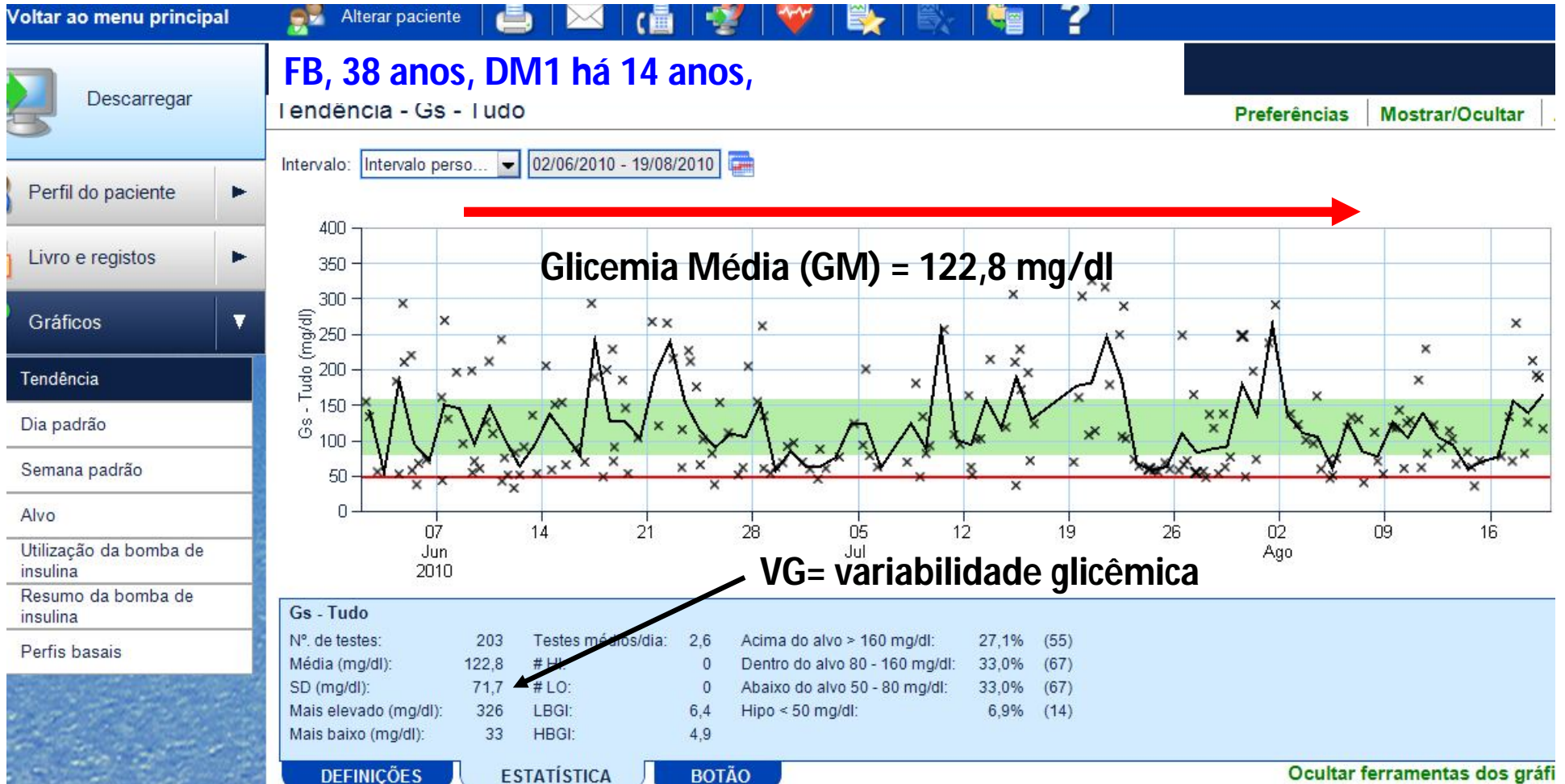
Período avaliado: 21- 07 a 17-08-2010

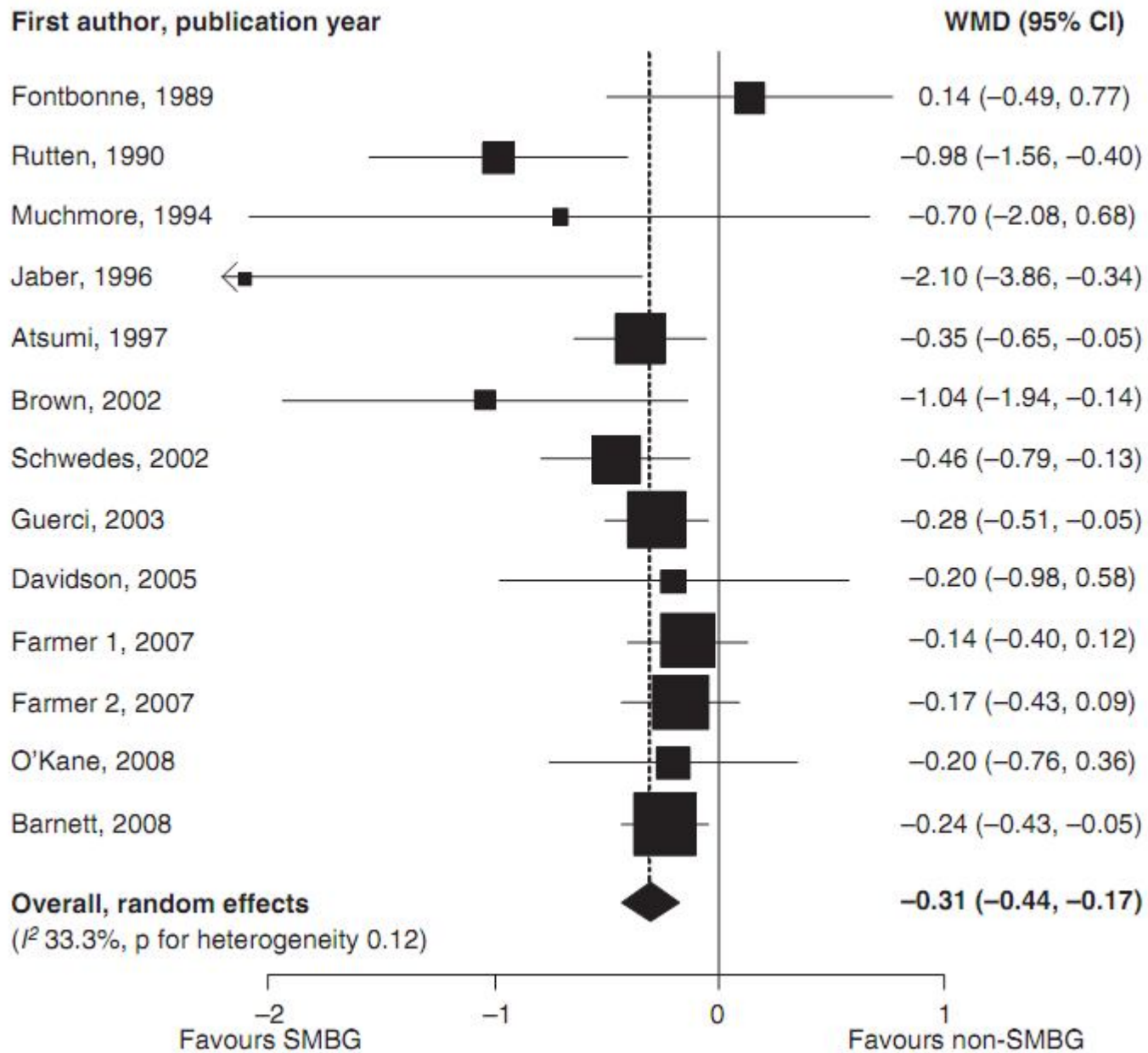
A1c = 7,0%



Período avaliado: 02/06 a 19/08/2010

A1c= 7,2%





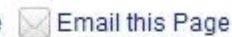
Allemann S, et al. Curr Med Res Opin 2009;25:2903



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FDA Public Health Notification: Potentially Fatal Errors with GDH-PQQ* Glucose Monitoring Technology

* *glucose dehydrogenase pyrroloquinoline quinone*

Date: August 13, 2009

Dear Healthcare Practitioner:

This is to alert you to the possibility of falsely elevated blood glucose results when using GDH-PQQ glucose test strips on patients who are receiving therapeutic products containing certain non-glucose sugars. These sugars can falsely elevate glucose results, which may mask significant hypoglycemia or prompt excessive insulin administration, leading to serious injury or death. The following provides background information on this problem, a summary of fatality reports FDA has received, and recommendations to reduce the risk. This problem can occur wherever these products are used including in-patient and out-patient healthcare facilities, and at home.

Nature of the problem

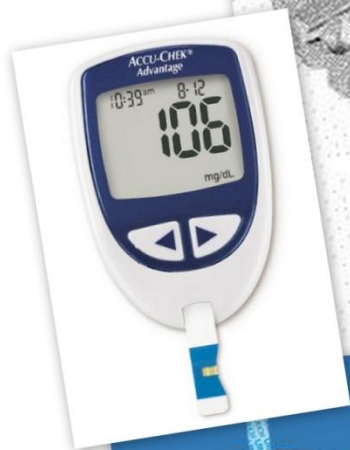
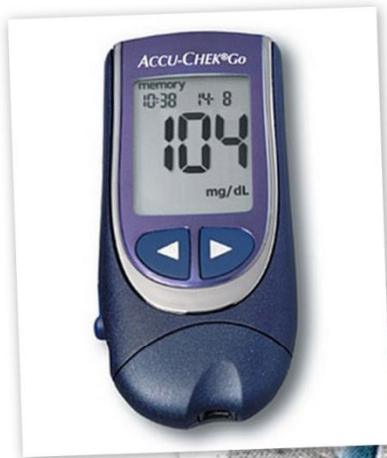
GDH-PQQ glucose monitoring measures a patient's blood glucose value using methodology that cannot distinguish between glucose and other sugars. Certain non-glucose sugars, including maltose, xylose, and galactose, are found in certain drug and biologic formulations, or can result from the metabolism of a drug or therapeutic product.

When these non-glucose sugars are present in the patient's blood, using a GDH-PQQ glucose test strip will produce an elevated glucose result which may suggest the need for clinical action. This can lead to inappropriate dosing and administration of insulin, potentially resulting in hypoglycemia, coma, or death.

In addition, cases of actual hypoglycemia may go unrecognized if the patient and healthcare practitioner rely solely on the test result obtained with the GDH-PQQ glucose test strips.

The following test strips (with associated meters) use GDH-PQQ methodology as of August 2009:

- **Roche Diagnostics:**
 - ACCU-CHEK Comfort Curve test strips
 - ACCU-CHEK Aviva test strips
 - ACCU-CHEK Compact test strips
 - ACCU-CHEK Go test strips
 - ACCU-CHEK Active test strips
- **Abbott Diabetes Care:**
 - Freestyle test strips
 - Freestyle Lite test strips
- **Home Diagnostics:**
 - TRUEtest test strips
- **Smiths Medical:**
 - Abbott Diabetes Care Freestyle test strips
- **Insulet:**
 - Abbott Diabetes Care Freestyle test strips





Dia Mundial do Diabetes 2010