

Manual of Hospital Glucose Management
—Theory and Practice—

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EXCEL macro : Graphic Protocol Analysis

This program supports doctors and nurses to determine optimal insulin infusion rate for the management of the plasma glucose concentration in critically ill patients.

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(Compatible after Microsoft office EXCEL 2000.

This program includes macro, and needs the adjustment of security level as medium.)

Use the manual book (currently in Japanese) with this program.

- 1) Use POCT device for the measurement of blood (or plasma) glucose
- 2) Use infusion pump for solution with glucose (nasogastric tube feeding as well)
- 3) Mix solution well with glucose or insulin
- 4) Tell the patient the sampling interval of blood glucose may be every one hour.
- 5) Usually, use 1st order linear change for the next IRI-abs estimation, usually. Or use 2nd order in case of rapid changes. However, see the IRI-abs graph at the bottom (blue lines) to estimate the next IRI-abs. Assume an inverse sigmoid dose-dependent curve which shows relation between insulin infusion rate and change of plasma glucose.

(You may use  for evaluation)

- > **DO NOT** increase or delete lines or columns. Use icon instead.
- > Input cells are indicated by . **DO NOT** input other cells.

Doctor's order for preparation of insulin

Insulin (R100U/ml) 50U

In 49.5 ml of saline (50ml)

Mix well and use a syringe pump for infusion.

To START

Use the delete icon  and input DELETE.

INPUT ID, name, date of birth

Input EGP=2.2

Input gender (0=female, 1=male), height (cm), weight(kg)

Input Date, Time

Input GIR (g/hr) that has been used by the time.

Input Insulin IR (U/hr) that you chose to start from the time.

Input GIR (g/hr), that will be used, in the next line.

Input Date, Next BG monitor time.

Repeat

For input of GIR and IIR, 2 cells were prepared. Use the left cells initially, and you may add GIR or IIR by inputting the next right cells. You may use formula instead of values as follows:

Example 1

GIR

$$=((13.5+10*2)/(500+20*2)*80*1+(13.5+10*2)/(500+20*2)*60*3)/4$$

Example 2

GIR

$$=20*0.5/2$$

Example 3

IIR

$$=(1.5*2.5+1.8*1.5)/4$$

Example 4

IIR


$$=60/4$$


Example 5


IIR

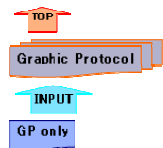
$$=4/4/0.6$$

USE OF ICONs

To increase rows use .

To decrease rows use .

To move to the input area: .



Move to the TOP

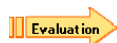
Redraw all graphs

Move to the upper input area

Redraw only X-Y graph.

Keep blank of cells on the right side of the X-Y graph, to have optimal graphic range.

However, you may input the limit of X or Y axis by input the value in the cells, and click the GR only icon.



Evaluation of the next IIR. If you input 1 to the YProt cell, you have the calculation by Yale Univ. Protocol (modified for Japanese). (Diabetes Care 27:261, 2004).

At start, since graphic protocol is not applicable, the value is indicated by the Yale Univ. insulin infusion protocol.

Other icons

	Chart 51	2		Chart 53	5	GraphTTL	5
	Chart 51	1		Chart 51	4	CkGraphTTL	5
	Chart 51	3					
Lines	4▲7▼	62		1			
		16					
		28					

- Clear graphs
- Clear 4 graphs
- Graphic protocol

- In case of malfunction of the graphs make cells of W1:X3 and Z1:AA3 blank.
- Usually in case of malfunction click .

- AB~AK : Adjusting the position of the graph of the **Graphic Protocol**

GraphTTL	5	9	35	Top	Left	30	375	Top	Left
CkGraphTTL	5	8	11	Bottom	Right				
GraphSize	420	Graphic Position Correction				to dG=0			

For research

On the right side, estimation of IRI-absolute by some functions is prepared for solver calculation of ISI-delta. Since BG level itself and distribution volume may have effect on the calculation, it is possible to correct the glucose uptake by BG or surface area in this table. However, in Japanese subjects who have been investigated, we have found that such effects were negligible in clinical situation.

You may use Diet, Energy sheets.

Use by your own risk, the author does not have responsibility of the results that may happen by the use of this EXCEL table and macros.