

# Deacon's Challenge No. 59 Answer

Stating any assumptions you make, estimate the maximum rise in plasma glucose (in mmol/L) which would be possible if an adult male was given a glucose load of 75 g

Question suggested by John Morton of Poole General Hospital

First calculate the amount of glucose administered in mmol:

Glucose formula =  $C_6H_{12}O_6$

Molecular weight calculation:

$C_6$	=	6 x 12	=	72
$H_{12}$	=	12 x 1	=	12
$O_6$	=	6 x 16	=	96
Total	=		=	180

Glucose (mmol) =  $\frac{\text{Glucose (g)} \times 1000}{\text{MW glucose}} = \frac{75 \times 1000}{180} = 417 \text{ mmol}$

(Multiplication by 1000 converts from g to mg)

To calculate the maximum rise in plasma glucose concentration make the following assumptions:

- All of the ingested glucose is absorbed
- None of the glucose is taken up by cells
- None of the glucose is excreted
- The glucose is distributed evenly throughout the extracellular fluid (ECF) volume
- The subject has an "average" ECF volume of 14 L

Therefore all of the 417 mmol of glucose is "dissolved" in a volume of 14 L and all that is required is to calculate the concentration:

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## MRCPath Short Questions MRCPath Short Questions MRCPath Short

Concentration (mmol/L) =  $\frac{\text{Amount of glucose (mmol)}}{\text{ECF volume (L)}}$

=  $\frac{417}{14} = 30 \text{ mmol/L (2 sig figs)}$

Therefore the maximum amount the plasma glucose can rise in an average adult male following ingestion of a 75 g glucose load is 30 mmol/L. ■

## Question 60

The older literature is full of enzyme data expressed in units other than International units per litre (U/L). For example, King-Armstrong (KA) units were used for many years to report alkaline phosphatase activity. One KA unit is the amount of enzyme in 100 mL of serum that will split 1 mg of phenol from phenylphosphate in one hour. Convert 200 KA units to U/L.

## Call for Nominations Election of ACB Officers 2006

In accordance with the provisions of Articles 14 and Bye Law 6.3, nominations are called for the annually elected Honorary Officers, Secretary, Assistant Secretary, National Meetings Secretary and Treasurer. All current incumbents of the Offices above are eligible and willing to stand a further Term of Office.

Nominations for these positions, duly countersigned, should be made on the nomination form in this issue of ACB News and sent to: ACB Administrative Office, 130-132 Tooley Street, London SE1 2TU before 31st March 2006.