

Stick or twist?

A stepwise approach to insulin dose adjustment

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Aims of the session

- To explore current approaches to insulin dose adjustment.
- To see the DAFNE stepwise approach in action for type 1 diabetes.
- To hear from a DAFNE graduate.
- To be interactive.



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What is your profession?

- Diabetes specialist dietitian
- Diabetes specialist nurse
- Practice nurse
- Staff nurse
- Dietitian
- GP / GPSI
- Consultant diabetologist
- Junior doctor / specialist registrar
- Other



How often do you advise people about insulin dose adjustment?

- Every day
- Once or twice a week
- Once or twice a month
- Rarely / never



Do you advise people about insulin dose adjustment with:

- Type 1 diabetes
- Type 2 diabetes
- Both



The DAFNE insulin regimen

What?

- basal insulin (BI) twice daily (on getting up and on going to bed)
- NPH or analogue basal insulin
- quick acting insulin (QA) 15 minutes before carbohydrate foods eaten (when possible)
- soluble or analogue QA
- minimum 4 blood glucose checks per day.



The DAFNE insulin regimen

Why?

- Berger trial used twice daily NPH to show reduced HbA1c with no increase in SH.
- Lower HbA1c maintained with twice daily BI as opposed to once daily
- Improved glycaemic control with QA taken 15 minutes before meals containing carbohydrate



The role of BI

- To provide 24-hour coverage insulin.
- To maintain BG within target range independently of any carbohydrate eaten.
- To ensure that if a person misses a meal their BG will not rise or fall by more than 1.0 or 2.0 mmol/L.



The role of QA

1. To prevent a sustained rise in blood glucose following the ingestion of carbohydrate.
2. To correct a blood glucose that is above or below target at mealtime or at bedtime by increasing or decreasing the dose of QA.
3. To prevent or to switch off ketone production when used in line with DAFNE sick day rules.



QA : CP ratios

- DAFNE works in carbohydrate portions (CP).
10g carbohydrate = 1 CP
- Ratios are the amount of QA needed to process 1 CP.
- Ratios written as 1 : 1
- Ratios can be
 $\frac{1}{2} : 1$ 1 : 1 $1 \frac{1}{2} : 1$ up to 3 : 1
- Start at 1 : 1
- Adjust up or down by half a ratio as required.



Case study 1 - Merryyn

Date	Before breakfast	Before lunch	Before evening meal	Bedtime	Comments
Day 1	12.5	6.9	5.4	12.2	
Day 2	13.8	5.7	6.1	11.7	
Day 3	11.4	4.3	7.6	13.0	
Day 4	13.6	8.1	7.3	12.5	

Will you **STICK** or **TWIST**?

Please choose option...

- Increase BI on getting up.
- Increase BI on going to bed.
- Increase QA at evening meal.
- None of the above.



Case study 2 - Johan

Date	Before breakfast	Before lunch	Before evening meal	Bedtime	Comments
Day 1	7.1	6.9	3.4	9.2	
Day 2	6.3	5.7	2.9	9.7	
Day 3	6.4				

Will you **STICK** or **TWIST**?

Please choose option...

- Increase QA at evening meal.
- Reduce QA at lunch.
- Reduce BI on getting up.
- None of the above.



What does the DAFNE stepwise approach suggest?

Stick or twist?



STICK!

None of the above...yet!



The stepwise approach

- Which BG is out of target?
- Exclude other causes
- Is there a pattern?
- Which insulin may be responsible?
- Adjust the relevant dose



Which BG is out of target?

- Before breakfast 5 – 7 mmol/L
- Before other meals 4 – 7 mmol/L
- Bedtime 5 – 9 mmol/L



Exclude other causes

- CP counting error
- Snacks
- Exercise
- Injection sites
- Over-treated a hypo
- Incorrect ratio of QA : CP used
- Under / over corrected previous BG
- alcohol
- Forgotten QA or BI



Is there a pattern?

- Insulin dose adjustment is not recommended for a one-off BG that is out of target.
- Wait for a pattern over 2 – 3 days
- Exception to the rule is for an overnight hypo.



Which insulin may be responsible?

- Consider timing of QA
- Consider duration of QA and BI
- Assessment strategies for QA and BI



Adjust the relevant dose

- Adjust BI by 10 – 20 %
- Adjust QA by half a ratio



The stepwise approach

- Which BG is out of target?
- Exclude other causes
- Is there a pattern?
- Which insulin may be responsible?
- Adjust the relevant dose



Day 1	Time	07:00	12:30	18:00	22:30	Comments
	CP					
	BG	12.5	6.9	5.4	12.2	
	QA					
	BI	12			12	
Day 2	Time	06:45	12:00	18:30	23:00	Comments
	CP					
	BG	13.8	5.7	6.1	11.7	
	QA					
	BI	12			12	
Day 3	Time	07:10	13:00	18:15	22:45	Comments
	CP					
	BG	11.4	4.3	7.6	13.0	
	QA					
	BI	12			12	

Day 1	Time	07:00	12:30	18:00	22:30	Comments
	CP	6	3	7		
	BG	12.5	6.9	5.4	12.2	
	QA	6+2	3	7		
	BI	12			12	
Day 2	Time	06:45	12:00	18:30	23:00	Comments
	CP	6	4	5		
	BG	13.8	5.7	6.1	11.7	
	QA	6+2	4	5		
	BI	12			12	
Day 3	Time	07:10	13:00	18:15	22:45	Comments
	CP	6	3	6		
	BG	11.4	4.3	7.6	13.0	
	QA	6+2	3	6		
	BI	12			12	

Will Merryyn **STICK** or **TWIST**?

Please choose an option...

- Increase BI on getting up.
- Increase BI on going to bed.
- Increase QA : CP ratio at evening meal.
- None of the above.



Day 1	Time	07:00	12:30	18:00	22:30	Comments
	CP	6	3	7		
	BG	12.5	6.9	5.4	12.2	
	QA	6+2	3	7		
	BI	12			12	
Day 2	Time	06:45	12:00	18:30	23:00	Comments
	CP	6	4	5		
	BG	13.8	5.7	6.1	11.7	
	QA	6+2	4	5		
	BI	12			12	
Day 3	Time	07:10	13:00	18:15	22:45	Comments
	CP	6	3	6		
	BG	11.4	4.3	7.6	13.0	
	QA	6+2	3	6		
	BI	12			12	

Think again...

- Which BG is out of target?
- Exclude other causes – what if...?



Will Merryn **STICK** or **TWIST**?

Please choose an option...

- Increase QA : CP ratio at evening meal
- Keep QA : CP ratio the same but include carbs for hot chocolate in CP count.
- Inject QA for hot chocolate when she drinks it.
- Correct BG on going to bed with QA.



Day 1	Time	07:00	12:30	18:00	22:30	Comments
	CP	6	3	7+2		
	BG	12.5	6.9	5.4	12.2	
	QA	6+2	3	7		
	BI	12			12	
Day 2	Time	06:45	12:00	18:30	23:00	Comments
	CP	6	4	5+2		
	BG	13.8	5.7	6.1	11.7	
	QA	6+2	4	5		
	BI	12			12	
Day 3	Time	07:10	13:00	18:15	22:45	Comments
	CP	6	3	6+2		
	BG	11.4	4.3	7.6	13.0	
	QA	6+2	3	6		
	BI	12			12	

Day 1	Time	06:30	12:00	16:55	20:30	Comments BG 4.3 at 17:10
	CP	3	6	6+2		
	BG	7.1	6.9	3.4	9.2	
	QA	9	9	6		
	BI	12			12	
Day 2	Time	08:00	13:30	17:30	22:00	Comments BG 5.4 at 17:45
	CP	3	4	4+2		
	BG	6.3	5.7	2.9	9.7	
	QA	9	6	4		
	BI	12			12	
Day 3	Time	08:00	13:30	17:30	22:00	Comments
	CP	4	0	3		
	BG	6.4	6.3	7.1	6.9	
	QA	12	0	3		
	BI	12			12	

Will Johan **STICK** or **TWIST**?

Please choose an option...

- Increase QA at evening meal.
- Reduce QA at lunch.
- Reduce BI on getting up.
- None of the above.



Day 1	Time	06:30	12:00	16:55	20:30	Comments BG 4.3 at 17:10
	CP	3	6	6+2		
	BG	7.1	6.9	3.4	9.2	
	QA	9	9	6		
	BI	12			12	
Day 2	Time	08:00	13:30	17:30	22:00	Comments BG 5.4 at 17:45
	CP	3	4	4+2		
	BG	6.3	5.7	2.9	9.7	
	QA	9	6	4		
	BI	12			12	
Day 3	Time	08:00	13:30	17:30	22:00	Comments
	CP	4	0	3		
	BG	6.4	6.3	7.1	6.9	
	QA	12	0	3		
	BI	12			12	



Stop
Look
Listen

DAFNE philosophy

‘The responsibility of DAFNE clinicians is to provide optimal, therapeutic educational care so that choices are fully informed, while recognising that ultimate responsibility and choice rests with the person with diabetes.’



Jenny's video.MP4



How may your approach to insulin dose adjustment differ after today?

Please choose an option...

- A lot
- A little
- Not at all



Thank you

If you are interested in becoming a DAFNE centre,
please contact us at:

www.dafne@nhct.nhs.uk

References



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