



EAST OF ENGLAND CHILDREN AND YOUNG PEOPLE'S DIABETES NETWORK

Care of Children and Young People with an HbA1C Greater than 75 mmol/mol (9%)

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3rd edition, July 2017, this edition has been updated in light of NG 18.

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2nd edition, August 2014, this edition is now updated and is consistent with 'peers review' quality assurance programme and with the other guidelines produced by the EEPDN. The author has also included the list of references with new layout of algorithms and comparison chart.

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CONTENT

1.	Introduction	3
2.	Initial Steps	3
3.	Additional Steps	3
4.	HbA1c 48-58 mmols/mol	4
5.	HbA1c 58-75 mmols/mol	5
6.	HbA1c 75 mmol/mol or above	6
7.	Basic steps comparison chart	8
8.	Appendix 1: Parents and Young People Education Check list	9
9.	Appendix 2: Action plan for management of raised HbA1c	11
10.	Appendix 3: Psychological issues	12
11.	References	12

1. INTRODUCTION:



Managing HbA1c effectively is key to optimising outcomes of childhood diabetes. HbA1c is recommended as the best indicator of long term diabetes control and correlates with adverse outcomes¹. Each 1% drop in HbA1c reduces the risk of long term complications by 40%^{2, 3}. In 2014-15, 23.5 % of children and young people (C & YP) with diabetes achieved the NICE recommended HbA1c target of <58mmol/mol (7.5%) with the greatest number of patients having an HbA1c between 58-80mmol/mol (7.5%-9.5%), and 21.3 % having a value >80mmol/mol (9.5%)^{4, 5}. With the updated NICE guidance in 2015 the recommended HbA1c target has been even lowered to ≤ 48 mmol/mol (6.5%) to minimize the risk of long-term complications¹. Epidemiological and prospective data also support a long-term influence of early metabolic control on clinical outcomes^{6, 7, 8}. In 2011/2012 the Best Practice Tariff (BPT)⁹ has been introduced in England to enhance the funding of paediatric diabetes services, with the aim of driving up the quality of care and improving outcomes for CYP with diabetes.

It is therefore crucial to treat hyperglycaemia effectively and aggressively. This guideline lays out the basic principles to help members of the diabetes team to develop consistent approach in the management of raised HbA1c. This guideline should be used in conjunction with EECYPDN guidelines on optimising glycaemic control¹⁰ in CYP with diabetes.

2. INITIAL STEPS:

It is important that members of the diabetes team address the following points initially and during follow up appointments.

- The key to discussing HbA1c levels: work out how the patient views the HbA1c values rather than imposing our beliefs e.g. present the reading and ask what they think about it, what it means & what they might want to do about it. The answers indicate their motivation towards change. Discuss with the family – what is the importance of the HbA1c?
- The questions could be: Do they need to know what they should do? Why they need to do it? and how to do it? Do they have a reason to do it? Do they have a reason not to do it?
- Consider use of flash sensor with alarm system
- Capillary blood glucose (CBG) monitoring: discuss the importance of testing before each meal and before bed i.e. eventually aim for a minimum of 4-6 tests per day but fewer may need to be accepted if there is resistance to change, discuss the target range and traffic light colour system to assist in recognizing trends; find other self-monitoring methods acceptable to the CYP.
- Consider the use of a 'smart' meter to help with calculating doses of insulin with meals and for the correction dose of insulin. Patients on an insulin pump should be encouraged to use pump calculator to calculate the doses of insulin
- Address other relevant issues: see education list in Appendix 1. Provide appropriate education over an agreed time frame and review the education list at least at annual review.

3. Additional Steps:

- All patients are given a named key worker (usually PDSN or dietitian) to help provide support, education and continuity of care.
- Clinical meetings held by MDT twice a month

Consider involving other agencies to support the family and CYP with diabetes

4. **HbA1c 48 – 58mmol/mol (6.5-7.5%)**

Continue with routine care & consider the following:

(Please discuss with CYP and/or family, document in Appendix 2 and file in notes)

Encourage CBG monitoring 4 – 6 times per day

Aim for pre-meal CBG¹ = 4 -7 mmol/L

Postprandial CBG¹ = 5-9 mmol/L

CBG > 5 mmol/l before driving

Pre bed CBG = individually tailored

Consider Post-prandial hyperglycaemia¹²

(Firstly encourage bolus administration pre-meal then improve overnight glycaemic control if necessary)

Discuss how and when to adjust insulin safely.

Some patients may need to be supplied with a self-management plan or an insulin adjustment table

In order to obtain a target HbA1c level of 48 mmol/mol (6.5%) or less, it is reasonable to expect 2 to 3 hypoglycaemic episodes per week which are mild, able to be detected by the CYP (except for infants / young children) and in which the cause can usually be determined.

Hypoglycaemic episodes that occur at particular times of the day, forming a pattern should be investigated further and an adjustment in insulin dose may be required. Episodes that are severe in nature, requiring third party assistance and where a cause cannot be determined should be investigated further¹³.

(Avoid overcorrection of hypoglycaemia)

Encourage regular exercise as part of diabetes management plan
(if not already physically active)

Consider psychological barriers and referral to additional services (appendix 3)

5. **HbA1c 58 – 75mmol/mol (7.5-9%)**

Continue with routine care & consider the following:
(Please discuss with CYP and/or family, document in Appendix 2 and file in notes)

Clinic appointments every 2 – 3 months
(with or without additional HbA1c measurement)

Contact with HCP/KW 2-6 Weekly...
Discuss the option home / school visit
after 6 weeks

Review education checklist (Appendix 1)

Aim for CBG monitoring 4-6 times per day
Aim for pre-meal CBG¹ = 4 - 7mmol/L, postprandial CBG¹ = 5 - 9
mmol/L, Pre bed CBG = individually tailored
CBG > 5 mmol/l before driving
Firstly try to improve overnight blood glucose control¹², then identify and treat
post-prandial hyperglycaemia

Discuss how and when to adjust insulin safely.
Some patients may need to be supplied with a self-management plan
or an insulin adjustment table. Check insulin sensitivity & carb ratios.
Consider CSII OR FGS(Libre) if meets NICE / CCG criteria

Encourage regular exercise as part of diabetes management plan
(if not already physically active)

Consider Libre or CGMS to identify trends in BG levels

Consider any psychological barriers and referral to
additional services (appendix 3)

6. HbA1c 75mmol/mol (9%) or above

Continue with routine care & consider the following:
(Please discuss with CYP and/or family, document in Appendix 2 and file in notes)

Make sure patient and family has key worker
1-3 Weekly contact / visits (agree type of contact with the family)

Consultant-led clinic appointments every 1 – 2 months if appropriate
(with or without additional HbA1c measurement)

Discuss patient 1-4 weekly(as agreed by team)in MDT/ clinical meeting

Consider psychological barriers (appendix 3) and referral to additional services

Review education checklist (Appendix 1)

Negotiate number of CBG tests per day
Agree and set pre-meal and post-prandial CBG targets
(Negotiate gradual change in targets to avoid discouragement)
incl. > 5 mmol/l before driving
Note: rapid drop in HbA1c can cause retinal haemorrhages,
particularly if there are pre-existing retinal changes

Discuss how and when to adjust insulin safely.
Some patients may need to be supplied with a self-management plan
or an insulin adjustment table. Check insulin sensitivity & carb ratios.
Consider change in insulin regimen or CSII¹⁴ if meets criteria

If no progress, consider admission for intensive education & management if
deemed appropriate & available.



Despite intensive intervention, some young people find it difficult to improve their diabetes management. Ensure that appropriate education is given & document that young person / family have had an opportunity to participate in the process.

NB: it is essential to maintain the relationship between HCPs & the patient & family and on occasions a change in KW or consultant may be considered

7. BASIC STEPS - Comparison Chart

48-58mmol/mols

Clinic appointment:
routine

Contact with family:
Minimum 8 contacts/yr.

HbA1c:
3 monthly

MDT meeting: as
required

Psychology:
If required

FGS/ CGMS:
If meets criteria¹⁰

BG monitoring:
Minimum 4-6/day

58-75mmol/mols

Clinic appointment:
2-3 month

Contact with
family: 2-6 weekly,
as negotiated

HbA1c:
3 monthly

MDT meeting:
Monthly

Psychology:
If required

FGS/ CGMS:
If meets criteria¹⁰

BG monitoring:
Minimum 4-6/day

>75mmol/mols

Clinic appointment:
1-2 month

Contact with family: 1-3
weekly as negotiated

HbA1c:
Consider more frequently

MDT meeting: (as possible)
Weekly/Fortnightly/Monthly

Psychology:
Make a referral if agreed

FGS/ CGMS:
Consider if meets criteria-
identify trends

BG monitoring:
More or less frequently as
negotiated

48-58mmol/mols

- Identify and treat post prandial hyperglycemia
- 2-3 hypoglycemia in a week may be acceptable, avoid overcorrection of hypo- see page 3

58-75mmol/mols

- intensify insulin regimen if appropriate - see EECYPDN guidelines on optimizing insulin therapy
- Identify and treat overnight hyperglycemia
- Consider CSII

> 75mmol/mols

- Consider home/school visit
- Consider interim BG & HbA1c targets
- Negotiate number of BG tests (be realistic!)
- Consider frequent face to face contacts (? In clinic);
- Explore the difficulties CYP may be facing
- No progress-consider admission

All other aspects of routine care should continue as usual

Appendix 1: Parents and Young People Education Check List

Parent name.....HCP Name.....

Date.....

<i>Topic</i>	<i>YP signature</i>	<i>Parent signature</i>	<i>HCP signature</i>	<i>Comments</i>
What is type 1 diabetes? Supply additional literature appropriate to local service				
Blood glucose testing Able to test BG Frequency of BG testing needed Able to use the glucose meter effectively Documenting BG and identifying trends				
Injection technique Insulin pens in working order Able to load insulin pen cartridge Able to perform correct injection technique Check injection sites & site rotation Storing injections				
Hypoglycemia Recognition and causes Management How to avoid overcorrection Competent in administration of Glucagon				
Hyperglycemia Definition and causes Management Understanding of correction factor When to check blood ketone levels & what actions to take				

Insulin dose adjustment Action of insulin types (appropriate to regimen) Knowing which insulin to adjust Knowing how to dose adjust 3 ways to adjust insulin (look back, put right, look ahead e.g. sport, parties!)				
Exercise Frequency & duration Diabetes management during Hypo prevention (during & after)				
Other issues if appropriate Eating out & parties Alcohol Relationships Driving & employment				
Dietetic Advise Knowledge of nutrition & healthy eating (glycemic index) Bedtime snack Carbohydrate counting Fasting and feasting!				
How to contact diabetes team Provide all telephone numbers				
Out of Hours advice arrangements Provide telephone numbers				

Appendix 2: Action plan for management of raised HbA1c

HCP.....

Date Completed.....

Prompt	Discussed	Action plan
48 – 58mmol/mols CBG monitoring 4 – 6 times per day Post prandial hyperglycemia Adjust insulin safely (self-management plan or an insulin adjustment table) 2-3 hypoglycemia in a week may be acceptable, avoid overcorrection of hypoglycemia Regular exercise if not already active Referral to additional services (psychology)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
58 – 75mmol/mols Clinic appointment 2-3 monthly Contact with HCP at least 2-6 Weekly Review education checklist CBG monitoring 4-6 times per day Identify and treat overnight hyperglycemia Post prandial hyperglycemia Consider CSII Adjust insulin safely (self-management plan or an insulin adjustment table) Regular exercise Referral to additional services (psychology)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
> 75mmol/mols 1-3 Weekly contact or visits Clinic appointment 1-2 monthly Monthly discussion in MDT/ clinical meeting Referral to additional services (psychology) Review education checklist Negotiate number of BG tests (be realistic) Adjust insulin safely (self-management plan or an insulin adjustment table) Explore the difficulties CYP may be facing No progress-consider admission	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	

Appendix 3: Psychological Issues

When considering psychological issues and/or referral to psychology:

- Additional information to gather, especially if seeking a consultation with a psychologist (areas of concern are often about family, school, peer relationships).
 - Dynamics within the family effecting or affected by diabetes.
 - Levels of independence in diabetes management and how appropriate this is.
 - Avoidance of things: school, social situations, any reminder of diabetes, etc.
 - Risk taking behaviour- generally and in relation to diabetes
- Find out about CYP and family's concerns about anger, anxiety, and low mood.
- Consider physical and social development e.g. adolescence, just starting senior school, changes in relationships, body image, etc.
- Consider using wellbeing screening tool - Peds QL

Type and level of input from psychology:

- Seek a case discussion/consultation about the case that is worrying you
- Next step could be a joint assessment/clinic appointment
- A referral to psychology for more in depth work may be appropriate
 - Other services might also be called in e.g. CAMHS, CSF

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