




Protocol For The Adjustment Of Insulin Dose By Paediatric Diabetes Specialist Dietitians Working With Children Within NHS Grampian

Co-ordinators: Aileen M ^c Killop-Smith, Paediatric Dietitian	Consultation Group: Dr Amalia Mayo Consultant Paediatrician RACH	Approver: Medicines Guidelines and Policies Group
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Executive Sign-Off

This document has been endorsed by the Chief Executive, NHS Grampian

Signature:  _____

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Across NHS Boards	Organisation Wide	Directorate	Clinical Service	Sub Department Area
	Yes			

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Lead Author/ Aileen M^cKillop-Smith, Paediatric Dietitian

Co-ordinator:

Subject: Protocol

Key word(s): Diabetes, dose adjustment of insulin, hyperglycaemia, hypoglycaemia, paediatric diabetes specialist dietitians, diet

Document application: NHS Grampian

Purpose: To authorise appropriately qualified and trained Paediatric Dietitians to advise alterations to insulin doses to individuals without the requirement for a patient specific prescription written by a medical practitioner or non-medical prescriber.

Responsibilities for implementation:

Organisational: Chief Executives and Management Teams

Departmental: Head of Service/Clinical Leads

Area: RACH and Dr Gray's Hospital

Hospital/Interface services: Assistant General managers and Group Clinical Directors

Operational Management Unit Operational Managers

Unit:

Policy statement: It is the responsibility of the line managers to ensure staff work to the most up to date and relevant policies, protocols and procedures. By doing so, the quality of the services offered will be maintained, and the chances of staff making erroneous decisions which may affect patient, staff or visitor safety and comfort will be reduced.

Review: This protocol will be reviewed at least every three years or sooner if current treatment recommendations change.

Responsible for review of this document: Aileen M^cKillop-Smith, Paediatric Dietitian

Responsible for ensuring registration of this document on the NHS Grampian Information/ Document Silo: Pharmacy and Medicines Directorate

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Responsible for disseminating document as per distribution list: Aileen M^cKillop-Smith, Paediatric Dietitian

Revision History:

Date of change	Approval date of PGD that is being superseded	Summary of Changes (Descriptive summary of the changes made)	Changes Marked* (Identify page numbers and section heading)
March 2023	April 2019	Professional qualifications and staff competencies. Reduction in level of post-registration experience required.	Page 2, Section 2
March 2023	April 2019	Patients who may be considered for adjustment of insulin dose. Removal of type 1 diabetes and CF related diabetes, so document covers all patients irrespective of type of diabetes.	Page 4, Section 7
March 2023	April 2019	Adjustment of insulin. Increasing insulin, blood glucose levels of >10mmol/l added. Decreasing insulin, blood glucose levels of <4mmol/l added.	Page 4-5, Section 7.1
March 2023	April 2019	Appendix 1 and 2. New competency documents added from BDA.	Page 7 and 10
March 2023	April 2019	Appendix 3 - NHS Grampian (2021) - Insulin: Carbohydrate (CHO) ready reckoner added.	Page 38
March 2023	April 2019	Document MGPG1024 updated to relate to dietitians only.	Throughout document.

* Changes marked should detail the section(s) of the document that have been amended, i.e. page number and section heading.

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Introduction

Type 1 Diabetes is a chronic condition and management should be tailored to suit the individual. There is strong evidence that good glycaemic control reduces the risk of long term complications¹.

Different health care professionals including Paediatric Diabetes Specialist Dietitians (PDSD) working as part of a multidisciplinary team are required to advise individuals with diabetes on the dose adjustment of insulin.

This protocol allows PSDS to be authorised to titrate the dose of insulin in children and adolescents, aged from 2 years to 18 years of age. It is designed as a guide to the safe limits within which PSDS can adjust insulin and the competencies required by them when recommending insulin dose adjustment.

This protocol applies to the dose adjustment of insulin as listed in section 6 of the British National Formulary². It is not applicable to the initial supply of insulin.

1. Who Will Recommend Dose Adjustment?

This protocol is intended for use by PSDS working at Royal Aberdeen Children's Hospital (RACH) and Dr Gray's Hospital, Elgin.

This protocol is specifically for staff members that **do not** hold supplementary prescribing qualifications.

Before adjusting insulin doses PSDS must have read this protocol and understand the context in which insulin dose adjustment is allowed by PSDS within NHS Grampian (NHSG).

2. Professional Qualifications And Staff Competencies

Health Care Professions Council (HCPC) Registered Dietitians with a minimum of 6 months experience working as a PSDS (see [Appendix 1](#)).

In addition, the following requirements are necessary, staff must:

- (i) Agree to be professionally accountable for their work.
- (ii) Be competent to assess the capacity of the patient/carer/parent/person with parental responsibility to understand the nature and purpose of the alteration in dose in order for them to give or refuse consent.
- (iii) Be aware of current treatment recommendations and be competent to discuss issues concerning insulin with the patient/carer/parent/person with parental responsibility.
- (iv) Meet and maintain the competencies outlined in the Competency Framework for NHSG PSDS advising on the dose adjustment of insulin within NHSG ([Appendix 1](#)).

- (v) Have been trained and assessed as being competent in the adjustment of insulin doses ([Appendix 2](#)).
- (vi) Maintain their skills, knowledge and their own professional level of competence in this area according to their individual Code of Professional Conduct³ and Standard of Conduct Performance and Ethics⁴.
- (vii) Undertake regular CPD in areas related to diabetes as per local and national policy.
- (viii) Dietitians are required to be members of the British Dietetic Association (BDA).
- (ix) Be competent in the interpretation of downloads from glucose meters, continuous glucose monitors (including flash glucose monitors) and pumps ([Appendix 2](#)).
- (x) Agree to work within the terms of this NHS Grampian protocol.

3. Responsibility of managers

Clinical managers are responsible for:

- (i) Ensuring staff are aware of and work in accordance with this protocol.
- (ii) Ensuring staff can provide evidence that they meet the competencies outlined in the NHS Grampian competency framework for NHS Grampian PDSD advising on the adjustment of insulin dose ([Appendix 1](#)).
- (iii) Ensuring staff are provided with opportunities to undertake adequate training in all areas relevant to this protocol. This includes any updates to training that may be required.
- (iv) Maintaining a current record of all staff authorised to recommend dose adjustment of insulin under this protocol.

4. Clinical Decision Making

There are many factors influencing glycaemic control in children and adolescents with type 1 diabetes. During consultations, the expertise of the PDSD is required to undertake an assessment of the patients' glycaemic control in relation to diet, exercise, blood glucose levels with or without continuous or flash glucose monitoring, current insulin dose and any other contributing factors. A treatment plan will be formulated and documented clearly within the patient's electronic record (SCI-Diabetes).

5. Patients Who May be Considered For Adjustment Of Insulin Dose

This protocol is intended for use by the PDSD in NHS Grampian working with children and adolescents with diabetes.

- (i) The PDSD will be authorised to titrate the dose of insulin for children and adolescents with diabetes in those aged from 2 years to 18 years of age.
- (ii) All patients/carers/parents/persons with responsibility who do not want specifically to consult with a doctor and are willing to have treatment from PDSD may receive advice on alteration of insulin dose.
- (iii) The PDSD will be authorised to titrate the dose of insulin only when insulin doses are given subcutaneously by syringe, insulin pen or continuous subcutaneous insulin infusion pump (CSii).

6. Exclusion Criteria

The PDSD will **not** advise on dose adjustment of insulin in the following patients/instances:

- (i) If the presenting clinical condition is deemed to be out with area of expertise and knowledge of the PDSD.
- (ii) Babies and toddlers up to 2 years of age who have been diagnosed with diabetes.
- (iii) All patients/carers/parents/persons with parental responsibility who want specifically to consult with a doctor and are not willing to have treatment from the PDSD.

In the above circumstances the PDSD will refer the case to a more experienced member of the diabetes team, e.g. Consultant, Registrar, or Lead PDSN.

7. Adjustment Of Insulin

Each dose of insulin that should be adjusted will be based on the clinical experience and professional judgement of the PDSD. The clinical decision will take into account all factors which may have influenced glycaemic control. Insulin doses are often suggested based on a ratio of quick acting insulin (units): carbohydrate intake (g).

For example 1 unit insulin to be administered for every 10g carbohydrate to be consumed. This is called the insulin to carbohydrate ratio (ICR). ICR can be increased or decreased as required to control blood glucose levels (Appendix 3).

7.1. Increasing Insulin

In the event of hyperglycaemia (pattern of blood glucose levels >10mmol/l), and after consideration of other factors that might influence glycaemia, the dose of insulin can be increased by a maximum of 10% of the current dose.

Where there are limitations on dose adjustment due to the insulin delivery device, doses should be increased by a minimum of 0.5 units to a maximum of 10% of the current dose.

Should the PDSN feel a greater increase is required they should seek advice from a more experienced member of the diabetes team, e.g. Consultant, Registrar, or Lead PDSN, as soon as possible.

7.2. Decreasing Insulin

In the event of hypoglycaemia (pattern of blood glucose levels <4mmol/l) and after consideration of other factors which may result in hypoglycaemia, blood glucose readings fall below the agreed target range, the insulin dose can be reduced by a maximum of 10% of the current dose.

Where there are limitations on dose adjustment due to the insulin delivery device doses should be decreased by a minimum of 0.5 units to a maximum of 10% of the current dose.

Should the PDSN feel a greater reduction is required they should seek advice from a more experienced member of the diabetes team, e.g. Consultant, Registrar, or Lead PDSN.

8. Documenting Changes

Adjustment to insulin should be recorded in SCI - Diabetes Database which can be accessed by all members of the Diabetes Team and General Practitioners. Documentation should include clinical justification or reasoning for advising a change.

9. Follow Up

When dose adjustment has been recommended the patient/carer/parent/person with parental responsibility will be provided with contact details for the diabetes team and advised who to contact should any problems arise.

The PDSN should consider a further follow up within an appropriate time scale to monitor the effects of the changes made and document appropriately.

The patient/carer/parent/person with parental responsibility should be made aware they can contact the diabetes team during office hours (Monday to Friday). Out with office hours (evenings and weekends) they can contact the paediatric medical ward at RACH.

Details of all changes to an insulin dose must be documented within the SCI-Diabetes Database which can be accessed by clinic staff and General Practitioners.

The PDSN may refer the patient to another member of the diabetes team for review if deemed clinically appropriate for example; further advice on the management of unwell patients, potential Diabetic Ketoacidosis, recurrent or severe hypoglycaemia.

10. References

1. The Diabetes Control and Complications Trial Research Group. [The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus.](#) N Engl J Med. 1993 Sep 30; 329(14):977-86. [Accessed 27th January 2023].
2. British National Formulary for Children 2018-2019 – The Pharmaceutical Press. [BNFC \(British National Formulary for Children\) | NICE](#) [Accessed 27th January 2023].
3. British Dietetic Association: Code of Professional Conduct (May 2017). [Code-of-Conduct.pdf \(bda.uk.com\)](#). [Accessed 27th January 2023].
4. Standards of conduct, performance and ethics – Health care professions council 2016. [standards-of-conduct-performance-and-ethics.pdf \(hcpc-uk.org\)](#) [Accessed 27th January 2023].

Appendix 1: Competency Framework For NHS Grampian PDSO Advising On The Adjustment Of Insulin Dose For Children With Diabetes NHS Grampian.

This framework is intended for the adjustment of insulin dose by PDSO working with children within NHS Grampian.

The above staff are required to have knowledge and understanding of:

Policies and guidelines

- NICE Guidelines - Diabetes (type 1 and type 2) in children and young people: diagnosis and management NG19 (Aug 2015)
- SIGN guidelines (www.sign.ac.uk)
- Management of Diabetes SIGN 116 (2010)
- Diabetes improvement plan (2021)
- Guideline for the management of children with diabetes in Grampian Hospitals (2018).

Clinical aspects

- Diabetes, its causes and symptoms
- The management of diabetes, including insulin profiles
- Understanding of the legal status of the medication involved
- Carbohydrate counting
- The principles and application of working in partnership with patients and carers.

Staff must be able to demonstrate competent practice related to the adjustment of insulin in 12 patient contacts per year.

Meeting the competencies.

Staff new to post or returning to work after a period of more than 1 year.

1. Theoretical Learning

The above staff are required to complete the following:

1.1 Learning about diabetes

All staff are required to gain extensive paediatric diabetes experience and knowledge:

- Through working with diabetes team and personal learning (RACH).

1.2 Learning about diet

All staff are required to attend a workshop on:

- Carbohydrate counting (NHS Grampian).

2. Practice Skills, Knowledge and Experience

- 2.1** Staff will follow patients through the system, observing patients who are referred on to the other members of the specialist diabetes multidisciplinary team such as Consultant, PDSN and psychologist where applicable.
- 2.2** Staff will observe and shadow a Consultant, PDSN or PDSN practicing dose adjustment within either of the following locations:
- Consultant led clinic
 - Consultation of patients with diabetes in the hospital ward or clinic.
- 2.3** Staff will be mentored on adjusting insulin doses in one of the above settings, with the opportunity for support and discussion from a PDSN or consultant/registrar.

Maintaining competencies

Existing staff will be required to provide and demonstrate evidence of continued competence to adjust insulin to enable them to continue to work within the NHS Grampian Policy.

Formats of achieving this:

1 Practice supervision with Peers, Consultants or PDSN's

- This should be undertaken a minimum of twice a year
- This can be in the form of 1:1 supervision or group supervision.

2 Audit of notes

12 SCI records to be audited annually for:

- Dose prescribed
- Adverse drug reaction
- Evaluation of treatment outcome and care
- Clear documentation.

Quarterly review of DATIX incidents will also be undertaken.

It is the responsibility of each individual PDSN to ensure this is complete.

3 Evidence of maintaining knowledge and skills in diabetes

Through attendance at relevant meetings, education seminars/conferences (national or local), critical appraisal of new evidence, annual and ongoing appraisal.

All learning for those new or returning to the post and for existing staff should be recorded as per professional CPD and TURAS requirements.

All staff will be required to include the competencies related to dose adjustment in TURAS.

In addition, an experienced PDSD will be identified to act as a source of advice, guidance and support for less experienced staff or those new to post.

In addition the following requirements are necessary. Staff must agree to:

- Be professionally accountable for their work
- Work within the code of professional standards of practice and behaviour for dietitians
- Work within the terms of the NHS Grampian Policy
- Not give advice to those who are not currently working under the policy for the adjustment of insulin.

Clinical managers will be responsible for:

- Ensuring that all staff are aware and work within the policy for the adjustment of insulin by PDSD's working with children with diabetes in NHS Grampian
- Ensuring that staff have received adequate training in all areas relevant to this policy
- Maintaining a current record of all PDSD's authorised to recommend dose adjustment of insulin under this policy.

Core Skills Training Guide

Paediatric Diabetes Dietitian (Band 6)

Caring for Children with Type 1 Diabetes

Name of Assessee	
Name of Assessor	
NHS Trust / Health Board	
Date Core skill document Commenced	
Expected date of completion	
Date for review	

Introduction

This core skills training guide has been developed by the Paediatric Sub Group of the Diabetes Specialist Group at the British Dietetic Association.

This guide is intended to support a new or current band 6 Paediatric Diabetes Dietitian, begin to and then enhance clinical understanding of type 1 diabetes and work on core skills that are needed to provide a competent, knowledgeable and skill based level of care to service users. This guide can be used to structure learning, streamline core skill development and enhance evidence base for appraisals. Additionally this guide can be used by a dietitian returning to practice, to support a dietitian to enhance a single area of knowledge, or can be used purely as a handbook to develop practice. There is no suggested time-line to complete the guide. The assessee and assessor could collaborate on completion dates.

The guide is divided in to different clinical skill topics and each topic has the following:

- Core Skill Performance Criteria – what it is that you will be required to understand and/or demonstrate?
- Underpinning Knowledge and Evidence – how you have evidenced your learning? (Written work including but not limited to reflection, evaluation of policy or guideline, critique of articles, direct observation, simulation or case scenarios).
- Self –Assessment – have you demonstrated the Core Skill sufficiently?
- Endorsement of Skill – to be agreed with a senior team MDT member. If you are a lone worker, or line manager does not have clinical diabetes knowledge, a member of the Paediatric Diabetes Sub Group can support as a mentor.
- Practical training/learning log if required – dates training/learning was observed/completed.

In the tables, boxes filled in with grey are not required to be completed.

Agreement:

This Skills booklet is to be used as an addition for learning and development and is not intended to replace local/regional clinical training by senior diabetes dietitians. This booklet is intended as a 'self-directed' programme for guidance of learning and is not validated. By completing this booklet, it does not guarantee 'safe, competent practice' by the assessee.

Signed by Assessee: _____ Signed by Assessor/Senior MDT member: _____ Date: _____

Core skill 1: Demonstrate familiarity with Type 1 diabetes and the clinical guidelines relevant to caring for children and young people (C&YP) with diabetes

Core Skill Performance Criteria		Self-Assessment (initial & date)			Endorsement of Skill	
		Underpinning knowledge and evidence	Observed/ discussed	Performed under supervision	Performed with minimum supervision	Assessor
1	<p>Demonstrate understanding and familiarity of:</p> <ul style="list-style-type: none"> • NICE guideline: Diabetes (type 1 and type 2) in children and young people: diagnosis and management (NG18) • NICE guideline: Continuous subcutaneous insulin infusion for the treatment of diabetes mellitus (TA151) • ISPAD Clinical Consensus Guidelines 2018 					
2	Understand the diagnostic criteria for type 1 diabetes and what target blood glucose readings should be					
3	Be familiar with symptoms of type 1 diabetes					
4	<p>Understand and be able to explain what glycated haemoglobin (HbA1c) is and what is the recommended target</p> <p>Explain the significance of HbA1c for long term health.</p> <p>Understand that 'Time in Range' or 'Time in Target' is an excellent marker of long term blood glucose control and is a user-friendly marker for patients to track at home</p>					

Core Skill Performance Criteria		Self-Assessment (initial & date)			Endorsement of Skill	
		Underpinning knowledge and evidence	Observed/ discussed	Performed under supervision	Performed with minimum supervision	Assessor
5	<p>Familiarise with the clinical guideline for management of a patient newly diagnosed with type 1 diabetes at your Trust/Health Board</p> <p>Understand that the patient may experience a 'honeymoon' period when the pancreas will still be producing a small amount of insulin.</p> <p>Understand that when a patient comes out of their 'honeymoon' period, insulin requirements could increase quickly</p>					
6	Familiarise with the clinical guideline for management of hyperglycaemia and sick day rules at your Trust/Health Board					
7	Familiarise with the clinical guideline for management of hypoglycaemia at your Trust/Health Board and where to seek emergency treatment in different clinical areas					
8	<p>If applicable, understand the dataset and requirements of</p> <ul style="list-style-type: none"> • Best Practice Tariff for children's diabetes • NPDA Audit <p>Understand how your Trust collates the relevant data and what your contribution towards data management involves</p>					

Core skill 2: Identify clinical and practical skills required to fulfil the role of paediatric diabetes dietitian

Core Skill Performance Criteria		Self-Assessment (initial & date)			Endorsement of Skill		
		Underpinning knowledge and evidence	Observed/ discussed	Performed under supervision	Performed with minimum supervision	Assessor	Date
1	Identify and demonstrate the use of standard blood glucose testing equipment (finger lancing device / blood glucose meter)						
2	Be able to change date/time of meters and record blood glucose readings from a meter in a logical format. Be able to locate 7 day blood glucose averages on meters. Understand that 7 day blood glucose average reading can correlate with HbA1c						
3	Familiarise with smart meters (if available) – be able to locate insulin to carbohydrate ratios and insulin sensitivity factors						
4	Familiarise with and demonstrate use of the Libre meter (if available) – understand this is Flash Glucose Technology, not Continuous Glucose Monitoring. (Refer to Core skill 6)						
5	Familiarise with insulin pen devices available and the unit increments each pen delivers. Know suitable injection sites and practise with demonstration equipment if able. Understand injection sites need to be rotated						

Core Skill Performance Criteria		Underpinning knowledge and evidence	Self-Assessment (initial & date)			Endorsement of Skill	
			Observed/discussed	Performed under supervision	Performed with minimum supervision	Assessor	Date
6	Familiarise with and be able to explain in detail the action of long acting insulins. Understand that long acting insulin is administered to achieve normal blood glucose control in the fasted state (consider glycogenolysis)						
7	Familiarise with and be able to explain in detail the action of fast acting insulins. <ul style="list-style-type: none"> Explain how fast acting insulin works with carbohydrate and describe a meal plan/routine to coincide with this insulin regime Understand that fast acting insulin is administered pre meal to reduce the post prandial rise in blood glucose readings Understand that the timing of administration is crucial to achieve good post prandial blood glucose control. Some fast acting insulin brands can be administered 15-30 minutes pre meal 						

Learning Log:

	Date Completed
Organise training from insulin and meter company representatives or liaise with internal nursing team for training	

Core skill 3: Identify and understand the role of digestion and absorption of carbohydrate foods in diabetes management

Core Skill Performance Criteria		Self-Assessment (initial & date)			Endorsement of Skill		
		Underpinning knowledge and evidence	Observed/ discussed	Performed under supervision	Performed with minimum supervision	Assessor	Date
1	<p>Explain that a healthy, balanced diet is encouraged and all food groups should be included daily.</p> <p>Advise that carbohydrate restriction is not required.</p>						
2	<p>Explain digestion and absorption of carbohydrate and understand how this process can impact blood glucose readings</p> <ul style="list-style-type: none"> - Understand carbohydrate is both starch and sugar and both digest to glucose - Understand that glucose passes from the gut into the blood stream - Understand that insulin is like a 'key' that unlocks cells allowing glucose to move from the blood into the cells of the body - Understand that different carbohydrate foods are broken down to glucose at different speeds - Understand that fibre plays a role in managing blood glucose readings as it can help slow the digestion and absorption of carbohydrate 						

Core Skill Performance Criteria		Self-Assessment (initial & date)			Endorsement of Skill		
		Underpinning knowledge and evidence	Observed/ discussed	Performed under supervision	Performed with minimum supervision	Assessor	Date
	- Understand that fat and protein metabolism can also impact blood glucose readings to a lesser extent in some circumstances						
3	Identify and discuss in detail foods and fluids that contain carbohydrate Discuss why some foods that do contain carbohydrate can be eaten without insulin (some vegetables, pulses, nuts for example) due to the high fibre content						
4	Understand and discuss the role of Glycaemic Index (GI) in diabetes management Explain low GI foods are favoured as they have a lower impact on post prandial blood glucose readings however not all low GI foods are a healthy choice (for example chocolate)						
5	Identify suitable carbohydrate free snacks and carbohydrate free recipes Determine what advice your Trust/Health Boards suggests for snacks/supper. Determine if carbohydrate containing snacks/supper can be offered without insulin (this will be a local agreement)						

Core Skill Performance Criteria		Self-Assessment (initial & date)			Endorsement of Skill		
		Underpinning knowledge and evidence	Observed/ discussed	Performed under supervision	Performed with minimum supervision	Assessor	Date
6	Discuss the inclusion of sweeteners in the diet Explain there might be a delayed glycaemic response with some sweeteners						
7	Adapt recipes to be suitable for a patient with diabetes						
8	Adapt recipes to be suitable for a patient with coeliac disease						
9	Adapt recipes to lower the calorie content						

Core skill 4: Apply principles of learning, teaching, empowerment and care planning to encourage patients to self-manage their diabetes using structured education

Core Skill Performance Criteria		Underpinning knowledge and evidence	Self-Assessment (initial & date)			Endorsement of Skill	
			Observed/discussed	Performed under supervision	Performed with minimum supervision	Assessor	Date
1	Familiarise with the Diabetes Team goals for HbA1c and blood glucose targets						
2	Familiarise with diabetes education materials available including – healthy eating, snacks, meal routines, general diabetes care						
3	Observe a paediatric diabetes specialist nurse deliver education to a newly diagnosed patient						
4	Observe a specialist paediatric diabetes dietitian deliver education to a newly diagnosed patient, including carbohydrate counting						
5	Deliver a carbohydrate counting session to a newly diagnosed patient <ul style="list-style-type: none"> • Discuss interpreting a food label and how to work out carbohydrate content from the 100g column and 'per portion' column • Discuss using the Carbs and Cals book or App for estimating carbs and for working out exact carbs with weighing 						

Core Skill Performance Criteria		Self-Assessment (initial & date)			Endorsement of Skill	
		Underpinning knowledge and evidence	Observed/ discussed	Performed under supervision	Performed with minimum supervision	Assessor
	<ul style="list-style-type: none"> Discuss importance of weighing and demonstrate how to weigh <p>Understanding:</p> <ul style="list-style-type: none"> Assess parent/carer/patient understanding by asking them to re-cap what has been taught Assess maths ability of parent/carer/patient to ensure safety Determine suitability of parent/carer/patient to carry out carb counting at home and out of the home <p>Be aware that in order to meet Best practice Tariff, Level 3 carbohydrate counting needs to be completed within 2 weeks of diagnosis (England only)</p>					
6	<p>Understand that an Insulin to Carbohydrate Ratio (ICR) is the amount of fast acting insulin that is required to match a pre-determined amount of carbohydrate. (An acceptable ICR is identified when a pre meal blood glucose and a two hour post meal blood glucose is the same).</p> <p>Describe what an Insulin to Carbohydrate ratio is to a patient and convey why ratios are beneficial to manage blood glucose readings</p>					

Core Skill Performance Criteria	Underpinning knowledge and evidence	Self-Assessment (initial & date)			Endorsement of Skill	
		Observed/discussed	Performed under supervision	Performed with minimum supervision	Assessor	Date
<p>Understand that an Insulin Sensitivity Factor (ISF) or Insulin Correction is the amount of fast acting insulin required to reduce a blood glucose by a predetermined number of mmol's.</p> <p>Describe that at each meal or snack time the dose calculation may require include both an ICR calculation and an ISF calculation if blood glucoses are above target.</p> <p><i>Note: Each Trust/Health Board will differ on how and who within the MDT sets ICR's and ISF's ratios. Familiarise with your local agreement</i></p>						
7	Familiarise with reputable online resources for carbohydrate counting for different age groups					
8	Apply working knowledge of the criteria above to facilitate and carry out an effective Annual Review with a patient if applicable (Each Diabetes Service will vary in content of an annual review. Agree these parameters within your MDT)					

Learning Log:

	Date Completed
Read Trust/Health Board Dietetic guideline for newly diagnosed patient with type 1 diabetes – if available	
Read Trust/Health Board specific Newly Diagnosed Education resource – if available	
Familiarise with carbohydrate counting resources and useful websites	

Core skill 5: Understanding the principles, delivery and treatment of diabetes using continuous subcutaneous insulin infusion therapy (pump therapy)

Core Skill Performance Criteria		Self-Assessment (initial & date)			Endorsement of Skill		
		Underpinning knowledge and evidence	Observed/ discussed	Performed under supervision	Performed with minimum supervision	Assessor	Date
1	Able to discuss principles of insulin pump therapy and patient eligibility Understand that only fast acting insulin is used in an insulin pump						
2	Familiarise with the insulin pumps offered in your service						
3	Understand how to set and review bolus calculator settings in pumps (use a demo pump): <ul style="list-style-type: none"> - Locate bolus calculator - Locate Insulin to Carbohydrate ratios - Carry out a bolus - locate last bolus given - locate Insulin Sensitivity Factor - locate blood glucose targets 						
4	Understand how to set and review basal rate settings Be familiar with how to set a temporary basal rate and scenarios that would require a temporary basal rate (exercise, illness)						
5	Understand that an insulin pump can deliver boluses in different ways. Familiarise with the different terminology used by different pump companies (dual wave, square wave, extended bolus, superbolus)						

Core Skill Performance Criteria		Self-Assessment (initial & date)			Endorsement of Skill		
		Underpinning knowledge and evidence	Observed/ discussed	Performed under supervision	Performed with minimum supervision	Assessor	Date
	Describe scenarios when using an advanced bolus is advantageous over a standard bolus (high fat/protein meals, low/high GI meals, parties, takeaways, eating out, cinema, high post prandial peaks)						
6	Familiarise with procedure for management of hypoglycaemia with an insulin pump						
7	Familiarise with procedure for management of high ketones and know who to direct patients to for safe management of high ketones						
8	Observe a paediatric diabetes nurse (or pump company representative) start a patient on an insulin pump						
9	Work with senior MDT colleagues to carry out insulin pump reviews and adjustments (if applicable)						

Learning Log:

	Date Completed
Read Trust/Health Board guideline for use of Continuous subcutaneous insulin infusion therapy (insulin pumps)	
Read ISPAD Clinical Practice Consensus Guidelines 2018: Diabetes Technologies, Chapter 21	
Locate and complete online training packages available from insulin pump companies	
Locate pump therapy and exercise management resources (if available)	

Core Skill 6: Understanding the principles of and the management of diabetes using Flash Glucose Monitoring and Continuous Glucose Monitoring

Core Skill Performance Criteria		Self-Assessment (initial & date)			Endorsement of Skill		
		Underpinning knowledge and evidence	Observed/ discussed	Performed under supervision	Performed with minimum supervision	Assessor	Date
1	Able to discuss principles of Flash Glucose Monitoring (Flash) and Continuous Glucose Monitoring (CGM) Understand that Flash and CGM are measuring interstitial fluid between cells rather than actual blood glucose						
2	Understand that Flash is not 'real-time' but rather a reflection of the blood glucose readings for the last 8 hours Understand that CGM is monitoring and displaying 'real time' blood glucose readings						
3	Have an appreciation of which patients are eligible for Flash or CGM funding (this will vary locally)						
4	Understand and explain that there is a 'lag time' between actual blood glucose readings and sensor glucose readings (this will vary between devices) Understand and explain that these devices show 'trend arrows' as to which direction the blood glucoses is moving and that the direction of the arrow can impact on decision making. Understand that CGM and Libre 2 (Flash), have alarms that can be set to alert users when their blood glucose readings are particularly high or low.						

Core Skill Performance Criteria		Self-Assessment (initial & date)			Endorsement of Skill		
		Underpinning knowledge and evidence	Observed/ discussed	Performed under supervision	Performed with minimum supervision	Assessor	Date
5	Discuss that by using sensor therapy, dietary analysis can help decipher if certain meal types, or meal composition can impact blood glucose readings immediately after eating, or several hours later						
6	Be able to support a patient to download their device in clinic (if applicable) or at home						
7	<p>Be able to locate appropriate reports on the software.</p> <p>Work towards understanding how to review a download and:-</p> <ul style="list-style-type: none"> - Be able to interpret an Ambulatory Glucose Profile (AGP) • Understand the terminology 'Coefficient of Variance', 'Standard Deviation' 'Time in Range' 'Average Sensor Glucose' and use these to evidence suggested changes (with or without MDT) 						

Core Skill Performance Criteria		Self-Assessment (initial & date)			Endorsement of Skill	
		Underpinning knowledge and evidence	Observed/ discussed	Performed under supervision	Performed with minimum supervision	Assessor
8	Use the necessary reports to discuss dietetic considerations including (but not exclusive to): <ul style="list-style-type: none"> - Are the Insulin to Carbohydrate ratios accurate? - Is the Insulin Sensitivity Factor accurate? - Do the patient experience high post prandial blood glucose readings? If so, how can they adapt insulin / food type to reduce the rise - How has exercise impacted their blood glucose readings? - Do specific meal types cause low blood glucose readings? 					
9	Familiarise with the software required to review the data from these devices and support a patient with technology failure issues where appropriate					

Learning Log:

	Date Completed
Liaise with company representative or MDT member to receive training in the devices	
Access the ABCD (DTN-UK) webcasts for Flash Glucose Monitoring and Continuous Glucose Monitoring (these are adult focussed webcasts)	

Core Skill 7: Understanding the management of hypoglycaemia

Core Skill Performance Criteria		Self-Assessment (initial & date)			Endorsement of Skill		
		Underpinning knowledge and evidence	Observed/ discussed	Performed under supervision	Performed with minimum supervision	Assessor	Date
1	Understand that hypoglycaemia (hypo) is a blood glucose reading less than 4mmol/l. Some Trusts/Health Boards use lower glucose readings – check local guidance						
2	Know that there can be mild, moderate or severe hypoglycaemic episodes. Know that the symptom not the blood glucose reading will dictate the severity of the hypo						
3	Be familiar with typical signs and symptoms of hypoglycaemia <ul style="list-style-type: none"> - Know that any hypoglycaemic episode should be treated as a medical emergency and action taken immediately - Know the possible causes of a hypo (exercise, too little food, too much insulin, illness) 						
4	Familiarise with local Trust/Health Board guidance on how to treat a mild, moderate or severe hypo for both MDI and pump therapy Work with the diabetes MDT to determine suitable oral treatment options for hypoglycaemia						

Core Skill Performance Criteria		Self-Assessment (initial & date)			Endorsement of Skill		
		Underpinning knowledge and evidence	Observed/ discussed	Performed under supervision	Performed with minimum supervision	Assessor	Date
5	Know where to locate treatment in the clinical area you work in Know who to contact urgently in the event of a patient requiring treatment with glucagon						
6	Understand that in some instances patients with a low HbA1c may be experiencing high numbers of hypoglycaemic episodes						
7	Understand that some patients may experience hypo unawareness - Be mindful that these patients may be eligible for CGM funding (service dependent)						
8	Consider recommending insulin to carbohydrate ratio adjustments if hypoglycaemia is occurring post meal repeatedly Consider long acting insulin adjustment if hypoglycaemia is occurring overnight or each morning repeatedly						
9	Understand that alcohol consumption can impact the liver's ability to produce sugar and can in some circumstances cause nocturnal hypoglycaemia (see Core Skill 9)						

Learning Log:

	Date Completed
Read Trust/Health Board guideline for the management of hypoglycaemia	
Read ISPAD Clinical Practice Consensus Guidelines 2018: Assessment and management of hypoglycaemia in children and adolescents with diabetes, Chapter 12	

Core Skill 8: Understand the management of type 1 diabetes in children and young people who are engaging in sport or exercise

Core Skill Performance Criteria		Self-Assessment (initial & date)			Endorsement of Skill		
		Underpinning knowledge and evidence	Observed/ discussed	Performed under supervision	Performed with minimum supervision	Assessor	Date
1	Understand that exercise and activity is critical for the health and well-being of children with type 1 diabetes						
2	Ensure recommended advice is reflective of current government guidelines for the amount of activity a child should be doing per day						
3	Understand that exercise can have varying impacts on blood glucose readings. Understand the differences between aerobic and anaerobic exercise and the effects they may have on blood glucose readings						
4	Advise that both insulin adjustment and carbohydrate consumption may be required to stabilise blood glucose readings during exercise						
5	Advise that the impact on blood glucose readings of competitive sport may vary from training and therefore different management strategies could be needed Advise that adrenaline can cause high blood glucose readings but this often fades once the exercise has finished						
6	Know that exercise can cause hypoglycaemia during the session, immediately after or several hours afterwards therefore frequent blood glucose testing is advised, especially overnight.						

Learning Log:

	Date Completed
Read Trust/Health Board guideline for the management of type 1 diabetes and exercise (if available)	
Read ISPAD Clinical Practice Consensus Guidelines 2018: Exercise in children and adolescents with diabetes, Chapter 14	

Core Skill 9: Transition care of adolescents with diabetes

Core Skill Performance Criteria		Underpinning knowledge and evidence	Self-Assessment (initial & date)			Endorsement of Skill	
			Observed/discussed	Performed under supervision	Performed with minimum supervision	Assessor	Date
1	Understand the needs of a young person transitioning to the adult service and consider suitable communication methods with these patients						
2	Understand the differences between standard diabetes clinic and transition clinic (if the service has separate clinics) and explain this to a patient						
3	Have awareness of medical ID options available to young people with diabetes						
3	<p>Advise of the risks of consuming alcohol. Clearly explain that alcohol reduces the production of sugar from the liver and contributes to the risk of nocturnal hypoglycaemia.</p> <p>Advise that small amounts of alcohol can be enjoyed when age appropriate, but large volumes of alcohol are not recommended in one sitting.</p> <p>In addition:</p> <ul style="list-style-type: none"> Ensure the young person knows to have carbohydrate containing food prior to going to bed (this could be without insulin – familiarise with local Trust/Health Board guidance) 						

Core Skill Performance Criteria	Underpinning knowledge and evidence	Self-Assessment (initial & date)			Endorsement of Skill	
		Observed/discussed	Performed under supervision	Performed with minimum supervision	Assessor	Date
<ul style="list-style-type: none"> • Ensure the young person knows to alternate alcoholic drinks with soft drinks • Ensure the young person knows that the signs of being intoxicated with alcohol can be similar to symptoms of hypoglycaemia and these can be masked by alcohol consumption • Ensure the young person knows that some alcoholic drinks have a high sugar content and should be limited • Ensure the young person knows to tell a reliable adult where and when they intend to be consuming alcohol and that each person has appropriate contact details 						
4	Consider how different experiences in adolescence could impact on diabetes management. For example driving, sex, pregnancy, drugs, moving out of the home, university, relationships and work.					

Core Skill 10: Understand, appreciate and enhance knowledge of coeliac disease and the impact on a patient with type 1 diabetes

Core Skill Performance Criteria		Self-Assessment (initial & date)			Endorsement of Skill		
		Underpinning knowledge and evidence	Observed/ discussed	Performed under supervision	Performed with minimum supervision	Assessor	Date
1	Define the diagnosis of coeliac disease						
2	Identify the treatment of coeliac disease						
3	Deliver gluten free advice to a patient newly diagnosed with coeliac disease						
4	Discuss and consider the implications of coeliac disease on the management of type 1 diabetes						
5	Familiarise with catering toolkits and advice for schools provided by coeliac UK						
6	Familiarise with the pathway of care for a patient diagnosed with coeliac disease. Establish which service providers are responsible for the on-going management of their coeliac care (Is their coeliac care delivered by the gastroenterology service or the diabetes service)						

Core Skill 11: Appreciating the psychological and therapeutic play aspect of diabetes care (if available). Consider the role of the Safeguarding Team

Core Skill performance Criteria		Self-Assessment (initial & date)			Endorsement of Skill		
		Underpinning knowledge and evidence	Observed/ discussed	Performed under supervision	Performed with minimum supervision	Assessor	Date
1	Spend a brief amount of time with the psychology team to appreciate their role within the diabetes team.						
2	Understand what aspects of a young persons' life may be impacted by diabetes, and understand how they can benefit from psychology support. Familiarise with referral procedure						
3	Spend a brief amount of time with the play therapist to appreciate their role within the diabetes team. Familiarise with referral procedure						
4	Spend a brief amount of time with the youth worker to appreciate their role within the diabetes team. Familiarise with referral procedure						
5	Know how to access the Trust/Health Board Safeguarding team and know what constitutes a referral to Safeguarding. Familiarise with referral procedure						

Core Skill 12: Develop, deliver and lead on a group or one to one cooking education session. (This service may not be available in all Trusts/Health Boards?)

Core Skill Performance Criteria		Self-Assessment (initial & date)			Endorsement of Skill		
		Underpinning knowledge and evidence	Observed/ discussed	Performed under supervision	Performed with minimum supervision	Assessor	Date
1	Assist in the organisation of a cooking session. Identify requirements for a cooking session, familiarise with facilities and equipment available						
2	Assist in the delivery of a cooking session						
3	Assist in the evaluation of a cooking session						
4	Ensure the cooking session has a theme, robust resources, uses seasonal produce and that specific outcomes are identified						
5	Familiarise with cost-effective food producers and supermarkets						
6	Demonstrate sufficient completion and submission of a risk assessment for cooking session. Identify the Trust Risk Lead and ensure risk assessment is submitted in advance						
7	Check that necessary staff have Food Hygiene Certificates to be able to deliver a cooking session						

Core Skill 13: Additional topics critical to role (if applicable)

Core Skill Performance Criteria		Self-Assessment (initial & date)			Endorsement of Skill		
		Underpinning knowledge and evidence	Observed/ discussed	Performed under supervision	Performed with minimum supervision	Assessor	Date
1	Attend/contact a school and liaise with the catering team to carbohydrate count a menu						
2	Consider the implications of carbohydrate counting for a school and how the school can be supported to implement carbohydrate counting						
3	Use photographs of foods to help improve understanding of portion size and carbohydrate content						
5	Spend some time with the ward hostesses/catering teams to understand their role and provision of meals/snacks on the ward						
6	Be able to offer appropriate advice for patients wanting to fast for religious reasons. Consider adjustments to insulin to carbohydrate ratios for those who will be having most of their carbohydrate intake overnight						
7	Be able to offer appropriate advice for meal scenarios including feasting, buffets, parties, cinema/theatre trips, eating out						

Identification of additional training needs and actions taken (to be used as necessary)

Training need identified	Date identified	Action taken	Date completed

Appendix 3: NHS Grampian (2021) - Insulin: Carbohydrate (CHO) ready reckoner, Version 3

Insulin: Carbohydrate (CHO) ready reckoner

V3: 23/07/21

	1:5	1:6	1:7	1:8	1:9	1:10	1:12	1:14	1:16	1:18	1:20	1:25	1:30	1:35	1:40
5	1.0	1.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.0
10	2.0	1.5	1.5	1.5	1.0	1.0	1.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
15	3.0	2.5	2.0	2.0	1.5	1.5	1.5	1.0	1.0	1.0	1.0	0.5	0.5	0.5	0.5
20	4.0	3.5	3.0	2.5	2.0	2.0	1.5	1.5	1.5	1.0	1.0	1.0	0.5	0.5	0.5
25	5.0	4.0	3.5	3.0	3.0	2.5	2.0	2.0	1.5	1.5	1.5	1.0	1.0	0.5	0.5
30	6.0	5.0	4.5	4.0	3.5	3.0	2.5	2.0	2.0	1.5	1.5	1.0	1.0	1.0	1.0
35	7.0	6.0	5.0	4.5	4.0	3.5	3.0	2.5	2.0	2.0	2.0	1.5	1.0	1.0	1.0
40	8.0	6.5	5.5	5.0	4.5	4.0	3.5	3.0	2.5	2.0	2.0	1.5	1.5	1.0	1.0
45	9.0	7.5	6.5	5.5	5.0	4.5	4.0	3.0	3.0	2.5	2.5	2.0	1.5	1.5	1.0
50	10.0	8.5	7.0	6.5	5.5	5.0	4.0	3.5	3.0	3.0	2.5	2.0	1.5	1.5	1.5
55	11.0	9.0	8.0	7.0	6.0	5.5	4.5	4.0	3.5	3.0	3.0	2.0	2.0	1.5	1.5
60	12.0	10.0	8.5	7.5	6.5	6.0	5.0	4.5	4.0	3.5	3.0	2.5	2.0	1.5	1.5
65	13.0	11.0	9.5	8.0	7.0	6.5	5.5	4.5	4.0	3.5	3.5	2.5	2.0	2.0	1.5
70	14.0	11.5	10.0	9.0	8.0	7.0	6.0	5.0	4.5	4.0	3.5	3.0	2.5	2.0	2.0
75	15.0	12.5	10.5	9.5	8.5	7.5	6.5	5.5	4.5	4.0	4.0	3.0	2.5	2.0	2.0
80	16.0	13.5	11.5	10.0	9.0	8.0	6.5	5.5	5.0	4.5	4.0	3.0	2.5	2.5	2.0
85	17.0	14.0	12.0	10.5	9.5	8.5	7.0	6.0	5.5	4.5	4.5	3.5	3.0	2.5	2.0
90	18.0	15.0	13.0	11.5	10.0	9.0	7.5	6.5	5.5	5.0	4.5	3.5	3.0	2.5	2.5
95	19.0	16.0	13.5	12.0	10.5	9.5	8.0	7.0	6.0	5.5	5.0	4.0	3.0	2.5	2.5
100	20.0	16.5	14.5	12.5	11.0	10.0	8.5	7.0	6.5	5.5	5.0	4.0	3.5	3.0	2.5
105	21.0	17.5	15.0	13.0	11.5	10.5	9.0	7.5	6.5	6.0	5.5	4.0	3.5	3.0	2.5
110	22.0	18.5	15.5	14.0	12.0	11.0	9.0	8.0	7.0	6.0	5.5	4.5	3.5	3.0	3.0
115	23.0	19.0	16.5	14.5	13.0	11.5	9.5	8.0	7.0	6.5	6.0	4.5	4.0	3.5	3.0
120	24.0	20.0	17.0	15.0	13.5	12.0	10.0	8.5	7.5	6.5	6.0	5.0	4.0	3.5	3.0
125	25.0	21.0	18.0	15.5	14.0	12.5	10.5	9.0	8.0	7.0	6.5	5.0	4.0	3.5	3.0
130	26.0	21.5	18.5	16.5	14.5	13.0	11.0	9.5	8.0	7.0	6.5	5.0	4.5	3.5	3.5
135	27.0	22.5	19.5	17.0	15.0	13.5	11.5	9.5	8.5	7.5	7.0	5.5	4.5	4.0	3.5
140	28.0	23.5	20.0	17.5	15.5	14.0	11.5	10.0	9.0	8.0	7.0	5.5	4.5	4.0	3.5
145	29.0	24.0	20.5	18.0	16.0	14.5	12.0	10.5	9.0	8.0	7.5	6.0	5.0	4.0	3.5
150	30.0	25.0	21.5	19.0	16.5	15.0	12.5	10.5	9.5	8.5	7.5	6.0	5.0	4.5	4.0

Read along the top (red row) to find your insulin:CHO ratio, then read along the side (green column) to the amount of CHO you are about to eat. Where the lines meet is the insulin dose for your meal/snack.

Correction Doses

		Insulin sensitivity (mmol/l) fall for 1 unit of insulin with target blood glucose of 6mmol/l															
TDD=	90+	75-89	60-74	55-59	45-54	35-44	30-34	23-29	18-22	16-17	14-15	12-13	10-11	8-9	6-7	4-5	
ISF=	1	1.2	1.5	1.7	2	2.5	3	4	5	6	7	8	10	12	15	20	
Blood glucose level	7-7.9	1	0.5	0.5	0.5	0.5											
	8-8.9	2	1.5	1	1	1	0.5	0.5	0.5								
	9-9.9	3	2.5	2	1.5	1.5	1	1	0.5	0.5	0.5						
	10-10.9	4	3	2.5	2	2	1.5	1	1	0.5	0.5	0.5	0.5				
	11-11.9	5	4	3	2.5	2.5	2	1.5	1	1	0.5	0.5	0.5	0.5			
	12-12.9	6	5	4	3.5	3	2	2	1.5	1	1	0.5	0.5	0.5			
	13-13.9	7	5.5	4.5	4	3.5	2.5	2	1.5	1	1	0.5	0.5	0.5	0.5		
	14-14.9	8	6.5	5	4.5	4	3	2.5	2	1.5	1	1	0.5	0.5	0.5	0.5	
	15-15.9	9	7.5	6	5	4.5	3.5	3	2	1.5	1.5	1	1	0.5	0.5	0.5	
	16-16.9	10	8	6.5	5.5	5	4	3	2.5	2	1.5	1	1	1	0.5	0.5	0.5
	17-17.9	11	8	7	6	5.5	4	3.5	2.5	2	1.5	1.5	1	1	0.5	0.5	0.5
	18-18.9	12	10	8	7	6	4.5	4	3	2	2	1.5	1.5	1	1	0.5	0.5
	19-19.9	13	11	8.5	7.5	6.5	5	4	3	2.5	2	1.5	1.5	1	1	0.5	0.5
	20+	14	11	9	8	7	5.5	4.5	3.5	2.5	2	2	1.5	1	1	0.5	0.5

1. Work out your current TDD (total daily dose) of insulin (red row)
2. Establish current blood glucose level (green column)
3. Where the 2 lines meet is the correction dose of insulin require to get BG back in to target by the next meal

TDD = Total daily dose | ISF = Insulin sensitivity factor



MS: WLS0221