Setting	Acute and ambulatory medical areas
For Staff	Medical and nursing staff
Patients	Children and Young people with type 1 diabetes and their families

Adapted
For NNUHFT Paediatric and Young Persons Service from East of England Network Guideline 2020

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East of England Children & Young People's Diabetes Network, Shared Guidelines Group
Newly Diagnosed Type 1 Diabetes Care Pathway for Children & Young People

Newly Diagnosed Type 1 Diabetes Care Pathway for Children and Young People (CYP)

(To be used up to the age of <17 years if admitted under paediatrics)

Introduction

Type 1 diabetes (T1DM), also known as insulin dependent diabetes is an autoimmune disease that permanently destroys beta cells in the pancreas, so that the body can no longer produce insulin. It is the most common form of diabetes in children and young

people (CYP). The current estimate of prevalence of Type 1 diabetes in CYP under the age of 19 years in the UK is one per 430-530.

T1DM symptoms should be treated immediately, as without treatment with insulin it is not compatible with life.

Symptoms include:

- History of polyuria/polydipsia
- Feeling tired
- Losing weight
- Skin infections
- Genital itchiness

Scope

This care pathway is to be used by all staff in clinical areas caring for newly diagnosed Children and Young Person (CYP) with T1DM up to their 19th birthday (see ref to adult care for aged 16-19 years). The care pathway will then be used by the CYP Diabetes team to continue care after discharge.

NB: when patients present with an elevated blood glucose who are obese or have a strong family history of type 2 diabetes or may not have weight loss continue to follow this care pathway but please discuss with the CYP Diabetes consultant (see Appendix 1) as other forms of diabetes may be considered. Also consider transient hyperglycaemia, where there is no history in keeping with diabetes.

CYP Diabetes Team: includes specialist CYP nurses, paediatric consultants, paediatric dietitians & paediatric clinical psychologists

Purpose

- To plan, facilitate and promote a safe, seamless commencement of insulin therapy
- To provide continuity and consistency of care, minimising duplication and gaps in care to CYP and families
- To ensure CYP and their families are given the appropriate education to enable them to continue management and become experts in their own diabetes management once discharged. The aim is a good quality of life and to reach their full potential.
- To minimise the risk of severe hypoglycaemia and diabetic ketoacidosis (DKA).
- To minimise prescribing errors.
- To increase CYP/ families' satisfaction with the care and advice given.

Definitions

World Health Organisation (WHO) diagnostic criteria for diabetes based on blood glucose measurement and presence of symptoms:

1. **Random plasma glucose concentration of equal to or greater than 11.1mmol/L**

Random is defined as any time of day without regard to time since last meal.

OR

2. **Fasting plasma glucose of equal to or greater than 7.0mmol/L**

   Fasting is defined as no caloric intake for at least 8 hours.

Note: ***Oral Glucose Tolerance Test (OGTT) is not required for diagnosis of TIDM.*** It is generally required for evaluation of suspected type 2 diabetes, monogenic diabetes or cystic fibrosis related diabetes.

Capillary Blood Ketones (CBK)

Capillary blood ketone measurement provides an accurate indicator of Diabetic Ketoacidosis (DKA). The blood ketone meters used in hospital, measures the blood ketone - β-hydroxybutyrate - directly. New patients are given a blood ketone meter for home use.

Interpretation of Blood Ketone Measurement	
Blood Ketones	**Significance**
Less than or equal to 0.6mmol/L	**Normal**
0.7 – 1.5mmol/L	**May require additional quick-acting insulin immediately. Inform doctor. Recheck blood glucose & blood ketones 2 hourly.**
1.6 – 2.9mmol/L	**AT RISK OF DKA** **Will require additional quick-acting insulin IMMEDIATELY (see page 9). Recheck blood glucose and blood ketones 2 hourly.**
Greater than or equal to 3.0mmol/L	**ASSESS FOR POSSIBLE DKA AS PER DKA GUIDELINE** • **Up to 18th birthday use:** The Integrated Care Pathway for Children & Young People with Diabetic Ketoacidosis (up to their 18th birthday • **18th birthday onwards use**: The Management of Diabetic Ketoacidosis (DKA) in Adults (i.e. aged over 18 years) – CGSG 119

Duties

Acute area staff (medical & nursing staff): print the care pathway from the Intranet and begin working through the pathway.

CYP Diabetes Team: support the acute area staff and continue working through the pathway with the CYP/family on discharge.

Key message

Families, children and young people with diabetes benefit greatly from a good start to diabetes care with confident, clear, positive messages, support and advice (NICE 2015)[1]. The International Society of Paediatric & Adolescent Diabetes (ISPAD) [2] recommends that from the outset care should be patient-focused with an emphasis on the CYP and relevant family members should receive care from an MDT comprising of specialists in both diabetes and paediatrics with specialist medical care.

Newly Diagnosed Type 1 Diabetes Care Pathway For Children and Young People (Up to 17 year if admitted under Paediatrics)

Name : *(Use sticker)*	NHS no.	Date *dd/mm/yyyy*:
Address:	Hospital no.	Time:
DOB:	GP:	Consultant:

Seen in (department):	Admitted to:

INITIAL RAPID ASSESSMENT

On presentation assess:

- **A**irway
- **B**reathing
- **C**irculation
- **D**isability

✓	O

Are any of the following present?

- blood pH < 7.30 or Bicarbonate <15mmol/L
- Blood glucose > 11.1mmol/L
- Blood ketones > 3mmol/L
- And/or dehydration > 5%

If so, consider **DKA AND IMMEDIATELY** Discuss with consultant on call. (see Appendix 1)

DKA YES π **NO** π

N.B. If CYP is in Diabetic keto-acidosis use **The Integrated Care Pathway for Children and Young People with Diabetic Ketoacidosis ,up to the age of 17 years if under paediatric care, (**or **The Management of Diabetic Ketoacidosis (DKA) in Adults , if over 16years and admitted to adult care)** .Print from Intranet. Clinical guidelines/ paediatrics/diabetes/ BSPED Integrated Care Pathway for CYP with DKA) Trustdocs17464

Also see section on management of ambulatory DKA, (Appendix 3)
http://nnvmwebapps01/TrustDocs/ViewDoc.aspx?id=17464
http://nnvmwebapps01/TrustDocs/ViewDoc.aspx?id=17464http://nnvmwebapps01/TrustDocs/ViewDoc.aspx?id=17464

*Print Care Pathway and use it in conjunction with the Starter Pack (see Page 13)

Staff details to be recorded in full below, then initials may be used within the document.

Name:	Signature:	Time	Date	Initials

ALL children presenting with newly diagnosed diabetes require the blood tests • below

BLOODS to take:	(✓)	Date	Initial	BLOODS to take:	(✓)	Date	Initial
• Thyroid function(TSH/T4				• GAD antibodies			
• Thyroid antibodies				• Islet- Antigen 2 (IA-2)			
• HbA1c				• Coeliac screen(TTG)			
• Lab glucose				• FBC, Ferritin , U&E, LFT			
Blood culture if febrile				Lipid profile			
Amylase if severe abdominal pain				CRP and urine culture if febrile			
Further infection screen dependent on clinical assessment				Vitamin D			

PLEASE NOTE: items with * denotes education and training sections or part-sections that **must be** provided to the child/young person & family before discharge.

***On diagnosis, CYP <u>MUST</u> be discussed with a senior member of the Children and Young Persons (C&YP) diabetes team within 24 hours of presentation. It is essential this information is documented below with details of discussion recorded in patient notes.**

Date:	Time:	Discussed with:	Name/signature/designation:

Each CYP to be seen by a member of the Diabetes Team on the next working day (Monday – Friday).

USEFUL CONTACTS:

Diabetes Nursing Team office: Tel: 01603 287504 (option 2) or

Email: pdsn@nnuh.nhs.uk

Diabetes out of Hours Service for patients: Tel: 01603 286286 (ask for Children's Assessment Unit)

(5pm to 8am Monday - Friday and 24 hours weekends and bank holidays).

Health care professionals may seek 24 hour advice through the on-call service. Please see the on –call folders for the escalation policy prior to calling the team (Appendix 1)

Ensure that diabetes training is commenced and documented. Key information and practical skills that CYP with type 1 diabetes need to know before they leave hospital are:

- **How to do CBG (capillary blood glucose)**
- **How to administer insulin**
- **Awareness of hypoglycemia and management**
  If CBG near normal range before discharge

Admission

Discuss with a member of the Diabetes Team (MDT)- record discussion in patient notes and in section on page 6- Overnight admission may be necessary for education and support, as some families need time to adjust to the diagnosis, even if not ketoacidotic.

Children under the age of 2 years must be admitted. Those under 6 weeks should be transferred to a tertiary centre.

Patients above 16 years of age are likely to be admitted to adult wards and managed by the adult medical/diabetes teams in collaboration with the CYP Diabetes Team (see Trust Guideline re management of Young People aged 16-18 years who present in DKA)

*Insulin

All CYP should be commenced on Multiple Daily Injection (MDI) insulin regimen, with carb counting, at diagnosis. CYP on MDI insulin regimen take a once daily basal insulin in the evening (before bed) and rapid acting insulin before carbohydrate containing food.

Give a **Total Daily Dose (TDD) of 0.75units/Kg**. For children less than 5 years, consider 0.5 units/Kg total daily dose.

CYP under 12 years require: 0.5 unit Novo pen Echo (red) for insulin Novorapid & 0.5 unit Novo pen Echo(Blue) for Degludec(or Levemir if under 2 years of age)

CYP over 12 years require: 0.5 unit Novo pen Echo (red) for insulin Novorapid & either 0.5u Novo pen Echo Blue for Degludec cartridges or Degludec Flexi pen (1 unit increments)

Table 1

Multiple Daily Injection Regimen:- Calculate total daily dose (TTD) as above :- Prescribe on EPMA/ paper chart Insulin Degludec 30% of TDD: Once a day in the evening (use Levemir 40% of TTD in the morning if under 2 years) Insulin NOVORAPID Calculate insulin to carb ratio based on 300, 400 or 500 rule and correction based on 100 rule(as box below on page 7) Print dose planner from S/Drive/Jenny Lind Diabetes Team/ Pump and MDI folder	EXAMPLE: child aged 6 years :- Weight = 20Kg x 0.75 units/Kg: TDD = 15 units Therefore: 1. Insulin Degludec (Tresiba):4.5 Units 2. Insulin NOVORAPID: Insulin to Carb ratio= 400/15 =26.66 (Use ICR 1:27) Correction factor 100/15 =6.66 (Use correction factor 1:7)

Dosing Guidance for calculating insulin to carb ratios			**STARTING INSULIN SENSITIVITY FACTOR (ISF)**
Under 5 years old: use 300 rule	**5 - 11 years old: use 400 rule**	**Over 11 years old: use 500 rule**	**100 rule**

Carbohydrate ratio:		Smart meter provided	Type:
Insulin Sensitivity factor:			Date:

ALL CYP newly diagnosed with type 1 diabetes need to be treated with insulin regardless of the time of day of diagnosis.

If the time of diagnosis does not fit with the insulin timings above i.e. it is not a meal time or bedt hyperglycaemia and commence Basal/ Bolus regimen at the first mealtime .

Always prescribe STAT dose of Insulin NOVORAPID on the STAT section of the drug chart /EPM

It is important to use **Insulin NOVORAPID** as this will reduce CBG and 'switch off' blood ketone product

Long acting insulin can be started at any time in the 24 hour period and there is no need to wait until the preferred time over the next few days

*Demonstrate to parents and CYP how to use their insulin pen and perform an **injection;** encourage them to practise	(✓)	**Date**

*Capillary Blood Glucose (CNG) Monitoring

The CYP and family will have a home blood glucose meter **in their starter pack.** It is important they become confident in its use. **Ensure they know the meter and finger-pricking/ lancet device are single person use only.**

NB. If the CYP is an in-patient, any insulin dose adjustments must be made using the blood glucose reading obtained from the Trust calibrated (point of care) blood glucose meter (please ensure patients use their own finger pricker device).

	(✓)	Date	Initial
• *Demonstrate to CYP and family how to use their CBG meter as soon as possible; once they are confident, encourage them to use meter • *Check CBG levels at least 6x/day including pre-meals, after school and pre-child/ parents bedtime. Overnight Glucose checking may also be advised during the post diagnosis period and later where clinically indicated. • *Record all results in home monitoring diary and on the prescription chart. Explain to CYP and family how to fill out diary • Discuss data download facilities e.g. Diasend, with family & provide details of how to set up an account and download (give NNUH Diasend clinic code 83-77913) .			

If CBG is less than 4mmol/L refer to the Guideline for Management of Hypoglycaemia (on the intranet)

*Capillary Blood Ketone (CBK) Monitoring

CHECK CBK ON ADMISSION: • CBK < 1.6mmol/L repeat at next CBG check. • CBK greater than or equal to 1.6mmol/L give Insulin NOVORAPID without delay. ○ If this coincides with a mealtime use the calculations in TABLE 1 pg 6. **Repeat CBK after 2 hours**. ○ If not a mealtime, give Insulin NOVORAPID dose at 10% of calculated TDD in TABLE 2 pg 8. **Repeat CBK after 2 hours**. • If CBK continue to be greater than or equal to 1.6mmol/L repeat STAT dose of Insulin NOVORAPID as above leaving a minimum of 2 hours between Insulin NOVORAPID doses. Report static or increasing CBK levels to doctors for advice re: further management- **see Appendix 1**-. **NB: CBK levels should reduce once insulin therapy has commenced.** • Once CBK less than1.6mmol/L repeat CBK with next CBG to avoid multiple finger-prick checks. • Once CBK levels are 0.6mmol/L or below no further CBK testing required unless the CYP deteriorates(NB: CBK of greater than 0.6mmol/L should not delay discharge in a well-child with reducing CBG) • The CYP Diabetes nurses will educate family re: use of CBK	(✓)	Date	Initial

testing meter in starter pack after discharge.			

*Management Of Elevated CBG Levels During First Few Days After Diagnosis

The blood glucose levels may 'run high' for the first few days. There is no need to keep correcting with extra doses of insulin NOVORAPID in between regular doses unless CBG **is >20mmol/L or has CBK above 0.6 mmols/l.** Constantly giving small amounts of insulin NOVORAPID in a newly diagnosed child who is well, is unnecessary.

Table 2

If CBG is greater than 20mmo/l three hours after the last bolus dose a further correction dose of Novorapid should be given. (If correction dose is not known give 10% of TDD of insulin as a correction dose).

Example :-

Child weight = 40Kg **TDD of 30units (if starting on 0.75 units/Kg/day)**

10% = 3 unit correction dose of Insulin NOVORAPID.

- **Correction dose can be given between meals or at night or dose added to mealtime insulin dose if due.**
- **Correction doses should have a minimum 3 hour gap between doses (2 hours on medical / diabetes team advice) and check CBG 2 hours after a correction dose is given.**

Always prescribe STAT/ correction dose of Insulin NOVORAPID on the 'ONCE ONLY PRESCRIPTION' section of the drug chart/ EPMA (ensure UNITS is written in full)

During next few days insulin doses will be adjusted by the family with the support of the CYP diabetes team.

*Dietary Intake

Explain to parents:	(✓)	Date	Initial
• *In the first few weeks following diagnosis CYP may eat more than they would normally. This is usual and will settle. • *CYP requires a **healthy, balanced and age appropriate diet.** No foods are off limits but some are best consumed after a main meal with insulin. • *Take carbohydrate with each meal. Snacks are not essential but in the first few weeks are expected due to increased hunger. • *CYP requires **sugar free drinks**. Diet fizzy drinks or squash with no added sugar are acceptable. • *Dietitian will advise on ideas for carb free snacks • Carbohydrate counting education will commence with family/young person at diagnosis and family will be seen by dietician for in depth carb counting education within 14 days			

Education (see Appendix 2)

*Encourage CYP and parents to begin reading the Education Booklets in the Starter Pack and, if able, download the Digibete app on their smartphone and link to **NNUH clinic code SRGMM**. Ask them to write down questions they have.

	(✓)	Date	Initial
• *Aim of treatment is to maintain BG levels pre-meal **4 – 7mmol/L** and post meal **5- 9mmol/L** as often as possible. For those intending to drive BG must be above **5mmol/L** before driving. • *Explain to parents and CYP **about hypoglycaemia (CBG level <4mmol/L),** its causes and how to treat, at an appropriate time. This is most important for those with CBG levels near normal range during admission. Please refer to hypoglycaemia information in **Education Booklets in starter pack.** • CYP Diabetes Team – blood ketone testing • CYP Diabetes Team - glucagon training. May take place after discharge • CYP Diabetes Team - hyperglycemia and illness management • CYP Diabetes Team – Management of exercise • CYP Diabetes Team - relevance of HbA1c and CBG 'time in target'			

Referrals and Multi-Disciplinary Team

	(✓)	Date	Initial
• Refer to CYP Diabetes Dietitian at diagnosis to commence/continue carbohydrate (CHO) counting education • CYP Diabetes Team to inform Paediatric Psychologist of Diagnosis. • CYP Diabetes team to complete GP letter regarding diagnosis and repeat prescription requirements. GP letter must be sent securely to GP by the end of the second working day after discharge. • CYP Diabetes Team to make OPA within 2 weeks **in** the appropriate clinic.			

Supplies From Pharmacy

*MDI Regimen (under 2 years)	*MDI Regimen (over 2 years)
• Insulin NOVORAPID 3mL PENFIL CARTRIDGES X 5 • Insulin LEVEMIR 3mL PENFIL CARTRIDGES X3 *Provide Novopen Echo x1 blue and x1 red as part of starter kit*	• Insulin NOVORAPID 3mL PENFIL CARTRIDGES X 5 with Novopen Echo red x1 • Insulin Degludec 3mL cartridges x5 with Novopen echo blue x1 or • Degludec Flexi pen x5 (for aged over 12 years only)
• BD Micro fine Needles (4mm) x 1 box of 100 • Glucogel or similar product , Glucagon im injection (dose for weight)	

Prescribe using EPMA			
Supplies have been ordered from pharmacy	**(✓)**	**Date**	**Initial**

Discharge

	(✓)	**Date**	**Initial**
• *Discharge weight • *Provide the CYP and family with 24-hour telephone contact numbers card and explain who and how to contact for support. Check postal address and family telephone contact numbers – document them • *Admitting Medical Team to review available blood results before discharge & inform CYP Diabetes Team of any pending results. • *If CYP Diabetes Team have not seen the patient before discharge please call 01603 287504(option 2 and leave a message) and email pdsn@nnuh.nhs.uk • Provide family with GP prescription letter and ask then to take to GP • CYP Diabetes Team to review pending/diagnostic blood results.			

It may be necessary for CYP to return to **CAU or outpatient** department if they require additional support with injections and/or CBG monitoring until CYP Diabetes Team becomes available. The CYP Diabetes Team will continue care after discharge.

Follow Up

- Family will be contacted by The CYP Diabetes Team following discharge. Home and school visits will be arranged as appropriate and within current infection control guidance.
- All children with T1DM should have access to 24 hours telephone advice.
- All school aged children require a school care plan in place either before or soon after return to school (the school care plan will be completed jointly by the family, school staff, C&YP Diabetes Team and School Health Team).

Contents of diabetes starter pack (rucksack) for family:

• Accu-chek Aviva Expert meter (or similar alternative)) • Accu-chek Fastclix lancet drums x 2 boxes • Accu-chek Aviva Test strips x 1 box of 50 strips • Control solution x 1 box • Optium Blood Ketone Test meter & box of strips • CYP Diabetes Education Booklets *Rucksack for younger children can contain a teddy.*	• Blood glucose diary • Small sharps bin, if available • Contact information card with telephone numbers for CYP Diabetes Team and CYP Diabetes Out of Hours Service (this is in the back of the communications / red folder) • Carbs & Cals Book • Lift Juice and / or Lift tabs

Monitoring Compliance

- Audit of care pathway
- Monitor any adverse incidents as per Trust policy

References

1) National Institute for Health and Care Excellence (2015) Diabetes (type 1 and type 2) in children and young people: diagnosis and management (ng 18)

2) International Society of Paediatric & Adolescent Diabetes (ISPAD) Consensus Guidelines 2018. www.ispad.org

3) Diabetes UK (DUK) 2012. 4 T's Campaign www.diabetes.org.uk

Appendix 1

24 hour ADVICE / ESCALATION PATHWAY FOR:
CHILDREN and YOUNG PEOPLE WITH DIABETES (CYPD)

Please read the escalation policy before contacting the team. Contact should only be made by Registrar level and above.

On diagnosis a child or young person (CYP) is to be *discussed* with a senior member of the CYPD team within 24hrs of presentation.

Referrals to the Diabetes team must be done by HCP mobile contacts should NOT be given out to families. The usual escalation process should be used up to the on call Consultant

↓

09:00 – 17:00 weekdays

Provided by the CYPD Team: 01603 287504 OR x3065 dect phone direct

Weekdays after 17:00, W/E & bank holidays

Provided by Paediatric Diabetes Team Via switchboard

All Newly Diagnosed CYP with Diabetes (CYPD) must be *seen* by a specialist paediatric diabetes team member on the next working day.

↓

09:00 – 17:00 weekdays

Contact CYPD team on: : 01603 287504 OR x3065 dect phone direct once diagnosis is confirmed

If out of hours: leave a message for the team on the same office number above OR email patient details to pdsn@nnuh.nhs.uk

Weekdays after 17:00, W/E & bank holidays

Provided by Paediatric Diabetes Team Via switchboard

The team will call back the next working day to arrange follow up.

ON-GOING ACCESS TO ADVICE HCP

The provider Unit must provide 24hr access to fellow HCP on management of diabetes admitted acutely with a clear escalation policy as to when further advice on managing diabetes emergencies should be sought. Provided by the usual escalation process should be used up to the on call Consultant or Registrar

↓

09:00 – 17:00 weekdays

Contact CYP Diabetes team on: 01603 287504 OR x3065 dect phone direct.

Weekdays after 17:00, W/E & bank holidays

Contact Paediatric Diabetes Team via switchboard

PATIENT/CARER ADVICE

The Provider Unit should provide 24hr access for all CYP with diabetes and their families for specific paediatric diabetes support.

CYP / parents are instructed to contact Children's Assessment Unit 01603 289774 OOH for advice. If advice is given out of hours: leave a message for the team on the same office number above OR email patient details to pdsn@nnuh.nhs.uk

↓

Out of Hours service (OOH)

Provided by the paediatric diabetes team contact via switchboard holding the rota

After hours 17:00 – 08:00, at weekends and bank holidays telephone support to CYPD and their families within the consortium.

On advice of Paediatric Diabetes consultant CATS (Children's Acute Transfer Services) would be contacted for treatment / transfer advice.	

Appendix 2

Education topics to be covered at Diagnosis and the first month following diagnosis. Structured education resources and Digibete are available to support education.

Topic	Date	Name	Signature	Designation
What is Diabetes?				
Causes & symptoms				
Explanation of Remission (Honeymoon) Period				
Insulin				
Different types of insulin, action & duration of action				
Dosages				
Use of correction doses				
Storage				
Leaflets				
Injections				
Technique				
Sites/rotation				
Use of pen/pump device				
Timing of insulin injections				
Disposal of sharps				
Capillary Blood Glucose Monitoring (CBGM)				
Why, how and when to check				
Target range and 'time in target'				
When and how to seek advice				
Ketone Testing				
Why, how and when to check				
Interpretation of results and actions to take				
When and how to seek advice				
Hypoglycaemia				
What is hypoglycaemia				
Causes/symptoms/prevention				
Management				
Dietary Advice				
Healthy eating				
Carbohydrate awareness/counting				
Exercise Management				
When to CBG monitor				
How to manage carbohydrates and insulin				
Illness Management				
Illness management and Diabetic Ketoacidosis prevention				
24hr Telephone contact numbers				
School				
School care plan				
Equipment for school including hypoglycaemia treatment				
Identifying a place to CBG monitor and inject				
Prescriptions				

When and how to obtain repeat prescription items				
Identification				
Medic alert / diabetes card				
Disability Living allowance				
Where to obtain form and access help to complete e.g. DUK				
Support Groups/ Services				
DUK, JDRF, East of England face book group				
Provide Information relating to impact of diagnosis and emotional well-being and how to access psychology support				

Appendix 3. Ambulatory Management of Mild DKA

Introduction:

A child who has mild DKA and appears well may be suitable for ambulatory management, with subcutaneous insulin and oral rehydration. Approximately 40% of children with confirmed DKA will fall into this category. **The decision to manage a child in this way should be discussed with the on-call consultant or a member of the diabetes team.**

Criteria for diagnosis of mild DKA:

- Appears well and able to tolerate oral fluids and food.
- PH 7.200- 7.299

Management:

- Administer a **Correction Dose** or 10% of TDD (total daily dose) of rapid-acting insulin analogue (eg: Novorapid, Humalog or Apidra) by **subcutaneous injection using an insulin pen** *as soon as possible.*
- The dose required can be calculated using the "The 100 Rule" (see below). This is a simple formula for calculating the expected drop in blood glucose produced by 1 unit of rapid insulin. This is called the Correction Factor (CF). Note that " the 100 rule" applies to all children treated using ambulatory management, ***including patients on insulin pumps***

The 100 Rule	Example
CF = 100 ÷ Total Daily Dose of Insulin The goal is to administer sufficient insulin to reduce the blood glucose below 10 mmol	*A child on total daily dose of 21 units, with a blood glucose of 29.8 mmol/L* Correction Factor = 100 ÷21 =4.8 Correction Dose = (29.8 – 10)÷ 4.8 = 19.8÷ 4.8 = 4.1 **Required dose = 4 u** *(round to nearest convenient dose)*

Correction Dose = (Blood glucose _ 10) **CF** Round fractions to convenient dose	

The initial correction dose of insulin may be repeated after 2-3 hours, if there is insufficient response to the initial injection. The child should start or resume their normal insulin therapy, (adjusted as appropriate for hyperglycemia), as soon as is convenient (usually at a normal meal time).

For newly diagnosed children in DKA, the Total Daily Dose can be calculated as follows:

TDD= 0.75 ×Body weight (kg)

See also new patient guideline:Initiate treatment as per the new patient guideline when the clinical condition has improved.

Monitoring:

• Hourly blood glucose and ketone measurements • 2-4 hourly blood gas measurements • Frequent clinical assessments	**Lack of clear resolution of acidosis/ketosis or hyperglycaemia within 4-6 hours or the patient becoming less well, is an indication for standard DKA therapy with IV fluids and insulin.**

Appendix 4

New Diabetes Letter for GP

Our Vision
To provide every patient with the care we want for those we love the most

Norfolk and Norwich University Hospitals NHS
NHS Foundation Trust

☐ **Dr Emma Webb , Dr Ravi Alanoor,**
☐ **Dr Vipan Datta , Dr E Sotiridou**
Consultant Paediatric Endocrinologists
Dr Jo-Anne Veltman : Specialist Dr
01603 286286 (ask for consultants secretary)

Jenny Lind Children's Department,
Norfolk & Norwich University Hospitals
NHS Foundation Trust,
Colney Lane,
Norwich, NR4 7UY
☎ 01603 286286

Paediatric Diabetes Specialist Nurses
☎ 01603 287504 (OPTION 2)
Email pdsn@nnuh.nhs.uk

Kris Howell 01603 289678
Lead Paediatric Diabetes Dietitian
kristoffer.howell@nnuh.nhs.uk

Type 1 (Insulin Dependent) Diabetes – New diagnosis	
Patient Details	Admission Date: Discharge Date: Follow-up:

Use label	

Your patient has been diagnosed with new onset diabetes. The family has received appropriate instruction on insulin injections and blood testing – including the recognition and management of hypo- and hyperglycaemia.

Advice on dietary management of diabetes and healthy eating has been/ will be arranged (delete as appropriate)

They have been commenced on the following insulin treatment:

Insulin Device	NovoPen Echo ½ unit insulin pen				
Normal Insulin Regime	Breakfast	Lunch	Evening Meal	Bed-time	
Insulin	NovoRapid 3mL Penfill Cartridges				Tick ☐
	Degludec 3ml penfill cartridges (prescribe for age 2 yearsand over) **OR**				Tick ☐
	Levemir 3mL Penfill Cartridges(aged 2 years and under)				Tick

We have **also** supplied the following prescription items:

Oral glucose gel ☐
Accu-Chek 'Aviva' Blood Glucose Meter & test strips ☐
Optium Xceed Neo Blood ketone meter & test strips ☐
BD 4mm Pen needles* ☐
Accu-Chek FastClix lancets (204)* ☐
2 small sharps boxes (1 for school) * ☐
Glucagon* 1mg for IM injection (1)

Note that the correct dose of glucagon is 0.5mg for children under 25kg, and 1.0mg for larger children.

The family has been advised to purchase dextrose or Lucozade tablets/drink for management of hypoglycaemia

We would be grateful if you could arrange for insulin and items marked * to be supplied on repeat prescription as soon as possible.

Children with diabetes have open access to the Children's Assessment Unit 24/7.

Signed	*Name (BLOCK CAPITALS) and Bleep No.*	*Date*