National Curriculum for the training of Health Care Professionals who care for Children and Young People with Diabetes Mellitus

Supporting, Improving, Caring

February 2013
We are grateful to the following organisations for their endorsement of this curriculum.

And to BSPED for their support of this document.
# NHS Diabetes: Education Group for Children and Young People with Diabetes

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National Curriculum for the training of Health Care Professionals who care for Children and Young People with Diabetes Mellitus

The following curriculum has been adapted from the SWEET Project EU\(^1\) for use in the UK. The SWEET Project EU was a three-year project (2008-2011) to improve standards of care for children and young people with diabetes and create Centres of Reference. The following background describes the development of the curriculum.

The documents and methods used to arrive at the SWEET curriculum included:

1) Examining currently available curricula\(^2-8\)
2) A PubMed search\(^9\)
3) Gathering together currently available guidelines, either those covering the broad spectrum of paediatric diabetes\(^10-14\) or some specific aspects of it (e.g. Diabetic Ketoacidosis)\(^15-21\)
4) Several meetings with members of the Multi-disciplinary team from those centres around Europe involved in the SWEET project
5) Consultation by questionnaire to clinicians around Europe

For full details of the methodology employed, please refer to the SWEET Project EU, Work Package 4 report available on their website\(^1\)

Development of the curriculum for professionals training specifically in Paediatric Diabetes

There was considerable overlap between the various sources of information, and the detail contained in each list was very variable, ranging from a broad outline to very detailed description of the content, such as in the IDF\(^4\) and Skills for Health\(^7\) documents. It was also clear that, in developing a curriculum aimed at all members of the MDT, there would be considerable overlap between the knowledge bases required by different members of the team. However it was clear that some aspects would be more relevant to certain members of the team than others in their daily work. Therefore in the SWEET Project EU\(^1\), Work package 4 the concept of a ‘core curriculum’, i.e. basic knowledge which needs to be common to all members of the diabetes team, and an ‘extended curriculum’, covering details that are more specific to individual members, was developed.

The hierarchical structure incorporated into the TREND\(^8\) Training Research and Education for Nurses in Diabetes (TREND-UK) Career and Competency Framework document for nurses was therefore used and adapted. Thus, whilst the TREND-UK document relates specifically to different levels of nurse training, this template was used in the SWEET curriculum as a way of defining increasing levels of knowledge within broad categories (e.g. dietetics or psychology). Thus some team members will be expected to reach a high level of application of knowledge in certain topics but not in others, and these will be different for the different disciplines. Furthermore, the level of knowledge will be expected to increase with further training and experience. All members of the team are expected to achieve level 1 which becomes the ‘core’ curriculum (Basic Awareness).

The definitions of the different levels are taken from the Skills for Health documents and are as follows:
1. **Basic awareness**: a limited and generalised understanding

2. **Factual knowledge**: knowledge that is detailed on a factual level, but does not involve more than a superficial understanding of principles or theories

3. **Working knowledge**: the application of factual knowledge in a manner that takes account of widely understood technical principles and implications within the field of practice

4. **In-depth understanding**: a broad and detailed understanding of the theoretical underpinning of an area of practice, including conflicting theories and constructs

5. **Critical understanding**: the ability to evaluate and devise approaches to situations that depend on the critical application of theories and conceptual constructs within the area of practice

**Sections**

Each section, of which there are 14 (listed below), is closely based on the International Society for Pediatric and Adolescent Diabetes (ISPAD) Clinical Practice Guidelines (2009)\(^{12}\) (amalgamating some of the chapters) with additional material and ideas gleaned from the Australasian Paediatric Endocrine Group (APEG)\(^ {11}\) and National Institute for Health and Clinical Excellence (NICE)\(^ {14}\) guidelines. Existing curriculum documents were then used to provide a list of the individual topics within each broad category to act as a checklist to ensure that all had been covered. The principal difference between this document and the guidelines is that here we only stipulate what topics should be learned without specifying the details of those topics. Each topic is divided into five levels, each of which contains several individual topics and they range from basic awareness level to expert practitioner.

1. **Aetiology, Epidemiology and Diagnosis**  
   2. **Phases of type 1 Diabetes**  
   3. **Other Types of Diabetes**  
   4. **Insulin Therapy**  
   5. **Complications of Diabetes**
      - **Acute**
        - Identification and treatment of hypoglycaemia  
        - Hyperglycaemia and Diabetic Ketoacidosis (DKA)
      - **Chronic**
        - Eye complications
        - Nephropathy
        - Neuropathy, Macrovascular and Dental disease
6. **Defining the Multi-disciplinary Team and Delivery of Ambulatory Services**  
7. **Education of Children and Young People and Carers**  
8. **Nutrition**  
9. **Management of Physical Activity and Exercise**  
10. **Monitoring of Diabetes and Screening for Associated Conditions**  
11. **Psychological Aspects**  
12. **Surgery, Fasting and Sick Day Rules**  
13. **Young People and Transition to Adult Care**  
14. **Vision of the Future for Children’s Diabetes Services**
Purpose of this document

The SWEET report was designed to be applicable, as far as possible, to all centres around Europe. The purpose of this document is to make it specific to the UK and to indicate the competencies that should be available from a fully functional Multi-Disciplinary Team (MDT). Thus each MDT should have members who, between them, have been trained in ALL of the competencies. Clearly the range will vary between individuals such that, for instance, the dietitians would be expected to know the in depth details of carbohydrate counting but would not necessarily be expected to know the finer points of how to change insulin pump settings.

In the SWEET document, the level of training for each member of the team was specified and categorised as either Essential (E), Desirable (D) or Not needed (N) (see below for difference between that document and this). Unlike that document, this one is NOT intended to specify which member should have attained which competencies (that will be the purpose of later competency documents) but rather to provide an overarching view of all the competencies which should be present within a fully functioning MDT.

Further work will then be undertaken by the different disciplines (medicine, nursing, dietetics and psychology) to specify not only which of these competencies should be attained by specific professions at different bands/grades as they progress through their career pathway but also the competencies that should be present within a fully trained MDT member.
<table>
<thead>
<tr>
<th>Section 1</th>
<th>Aetiology, Epidemiology and Diagnosis</th>
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<tbody>
<tr>
<td><strong>Level</strong></td>
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<tr>
<td><strong>One</strong></td>
<td><strong>Basic awareness</strong></td>
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<tr>
<td></td>
<td>Be able to define diabetes mellitus.</td>
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<td></td>
<td>Demonstrate understanding of the difference between type 1 diabetes and type 2 diabetes in terms of clinical presentation, patient characteristics and pathogenesis.</td>
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<td>Identify the laboratory investigations used to diagnose diabetes and their appropriate use (fasting blood glucose, post-meal blood glucose, oral glucose tolerance test).</td>
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<tr>
<td><strong>Two</strong></td>
<td><strong>Factual knowledge</strong></td>
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<td><strong>As above and:</strong></td>
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<td></td>
<td>Recognise the role of genetic and environmental factors and immunology in the development of type 1 diabetes.</td>
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<td></td>
<td>Be able to describe the role of genetic and environmental factors, obesity, insensitivity to insulin and insulin deficiency in the development of type 2 diabetes.</td>
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<td>Describe the emerging trend of type 2 diabetes in young people.</td>
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<td>Understand the appropriate use of the following tests: c-peptide, insulin antibodies, islet cell antibodies and Glutamic Acid Decarboxylase Autoantibodies (GAD) antibodies assays, as well as urinalysis (urine glucose and ketones) and HbA1c estimation.</td>
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<td></td>
<td>Explain &amp; apply the World Health Organisation diagnostic criteria for the different disorders of glycaemia.</td>
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<td><strong>Three</strong></td>
<td><strong>Working knowledge</strong></td>
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<td><strong>As above and:</strong></td>
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<td>Explain the basic physiology of digestion, absorption and metabolism.</td>
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<td>Portray &amp; be knowledgeable about the incidence and prevalence of diabetes globally and locally.</td>
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<td>Differentiate between the disorders of glycaemia: impaired glucose tolerance and impaired fasting glucose, type 1 diabetes, type 2 diabetes, other specific types of diabetes (such as Maturity onset diabetes of the young (MODY), Latent Autoimmune Diabetes of Adulthood (LADA), steroid-induced diabetes), gestational diabetes, diabetes that occurs secondary to other chronic disease in childhood – such as cystic fibrosis, haemoglobinopathies.</td>
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<td>Define the natural history of diabetes, including failure of oral blood glucose-lowering agents.</td>
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<td>Explain normal insulin synthesis and secretion.</td>
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<td>Demonstrate understanding of the hormonal, metabolic and neural control of insulin production and secretion.</td>
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<td>Illustrate insulin action to others.</td>
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<td>Define the role of insulin receptors to others.</td>
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<td>Be able to describe the structure and function of key organs, such as the pancreas, liver, muscle, adipose tissue, kidney, etc.</td>
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<td>Identify that there is a relationship between blood glucose and insulin in healthy people including gluconeogenesis, glycogenolysis, lipolysis and ketogenesis.</td>
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<tr>
<td><strong>Four</strong></td>
<td><strong>In-depth understanding</strong></td>
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<td></td>
<td><strong>As above and:</strong></td>
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<td>Be able to explain and describe the relationship between blood glucose and insulin in healthy people including gluconeogenesis, glycogenolysis, lipolysis and ketogenesis.</td>
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<td>Demonstrate understanding of factors that can affect the accuracy of laboratory investigations.</td>
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<td>Discuss the effect of insulin and counter-regulatory hormones on fuel homeostasis (carbohydrate (CHO), fat and protein).</td>
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### Section 1: Aetiology, Epidemiology and Diagnosis

<table>
<thead>
<tr>
<th>Level</th>
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<tbody>
<tr>
<td>Five (Critical understanding)</td>
<td>Be able to demonstrate understanding to others of the characteristics of the metabolic syndrome and the importance of its being recognised and treated.</td>
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<td></td>
<td>Define and be able to offer explanations to others of the effect of defective insulin action or ’insensitivity to insulin’ (also known as ‘insulin resistance’) in terms of genes, adiposity, gender, diet, exercise, hyperglycaemia, drugs and infection.</td>
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<td>Explain the incretin system and its importance in glucose regulation.</td>
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<td>Define and portray the results of insulin deficiency and its effects on lipid and protein metabolism, as well as carbohydrate metabolism.</td>
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<td>Be able to demonstrate understanding of and explain to others how increased blood glucose levels lead to diabetes complications, including the polyol pathway, oxidative stress, glycation and protein kinase C.</td>
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## Section 2 Phases of Type 1 Diabetes

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<tr>
<th>Level</th>
<th>Phases of Type 1 Diabetes</th>
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</table>
| **One (Basic awareness)** | Demonstrate awareness that although Type 1 is the commonest form of diabetes in children and young people (CYP), other types may occur.  
Be knowledgeable that diabetes is not an ‘all or none’ condition and that the risk of diabetes complications will increase with diabetes duration.  
Demonstrate understanding of the concept of the ‘remission’ period in Type 1 diabetes.  
Be able to recognise that insulin requirements change with loss of the ‘remission’ period.  
Distinguish and be able to react to young people’s constantly changing insulin requirements during growth and development.  
Be able to describe the clinical, nutritional and psycho-social needs of children at each stage of growth and development, and the ways in which diabetes impacts on daily living at each stage. |
| **Two (Factual knowledge)** | As above and:  
Identify and describe the need for regular monitoring of growth in weight and height, and the importance for children of following correct percentiles on a chart.  
Be knowledgeable about and be able to explain the natural progress of Type 1 diabetes and the resulting need for changes in insulin with the loss of the ‘remission’ period and progress through puberty. |
| **Three (Working knowledge)** | As above and:  
Demonstrate awareness that there are currently no proven methods of preventing the progress of established type 1 diabetes although studies are in place that may change this situation.  
Be able to initiate treatment of diabetes (as prescribed by the medical or non-medical prescriber) at home or in an ambulatory situation if the patient appears well at the time of diagnosis.  
Recognise and be able to investigate abnormalities of growth and development. |
| **Four (In-depth understanding)** | As above and:  
Demonstrate understanding of how to alter insulin dosages with loss of the ‘remission’ period.  
Identify and be knowledgeable about how to alter insulin dosages as puberty progresses. |
| **Five (Critical understanding)** | As above and:  
Be knowledgeable about and able to explain to patients and carers & other staff members about how to alter insulin doses with loss of ‘remission’ period and as puberty progresses.  
Provide education and be able to evaluate the effect of the education to patients and carers about insulin adjustments so as to promote self-management. |
## Section 3: Other types of Diabetes

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<tr>
<th>Level</th>
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<tr>
<td><strong>One (Basic awareness)</strong></td>
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<tr>
<td>Demonstrate understanding that, although type 1 is the commonest form of diabetes in CYP, other forms of diabetes do occur. Recognise and explain why it is important to make an appropriate diagnosis as this may affect the treatment given.</td>
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<td><strong>Two (Factual knowledge)</strong></td>
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<td>As above and:</td>
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<tr>
<td>Consider and have knowledge regarding the incidence and prevalence of diabetes globally and locally.</td>
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<td>Differentiate between the disorders of glycaemia:</td>
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<tr>
<td>• impaired glucose tolerance and impaired fasting glucose</td>
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<tr>
<td>• type 1 diabetes</td>
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<td>• type 2 diabetes, including obesity and polycystic ovarian syndrome</td>
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<td>• other specific types of diabetes (e.g. MODY, LADA, steroid-induced diabetes and other syndromes)</td>
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<td>• neonatal diabetes</td>
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<td>• mitochondrial diabetes</td>
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<td>• gestational diabetes</td>
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<tr>
<td>• diabetes that occurs secondary to other chronic diseases in childhood – such as cystic fibrosis, haemoglobinopathies etc</td>
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<td>Demonstrate understanding of the difference between type 1 diabetes and type 2 diabetes in terms of clinical presentation, patient characteristics and pathogenesis.</td>
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<td>Portray knowledge regarding the emerging trend of type 2 diabetes in young people.</td>
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<td>Be able to acknowledge and offer explanations regarding the role of genetic and environmental factors, obesity, insensitivity to insulin and insulin deficiency in the development of type 2 diabetes.</td>
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<td><strong>Three (Working knowledge)</strong></td>
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<tr>
<td>Elucidate regarding the World Health Organisation diagnostic criteria for the different disorders of glycaemia.</td>
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<td>Distinguish and explain the laboratory investigations used to diagnose diabetes and their appropriate use (fasting blood glucose, post-meal blood glucose, oral glucose tolerance test).</td>
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<td>Demonstrate understanding of the associations between type 2 diabetes, obesity and polycystic ovarian syndrome.</td>
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<td>Be able to explain the different blood glucose-lowering agents available (secretagogues, biguanides, thiazolidinediones, incretin mimetics, DPP-4 inhibitors and alpha glucosidase inhibitors), their mechanisms of action and maximum dosage.</td>
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<td>Consider the role of blood glucose-lowering agents in the management of type 2 diabetes.</td>
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<td>Portray understanding of the possible side effects and potential problems associated with the use of secretagogues, biguanides, thiazolidinediones, alpha glucosidase inhibitors, incretin mimetics and DPP-4 inhibitors.</td>
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<td>Review the use of lucose-lowering therapies in MODY and neonatal diabetes.</td>
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<tr>
<td>Section 3</td>
<td>Other types of Diabetes</td>
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<tr>
<td><strong>Level</strong></td>
<td><strong>Four (In-depth understanding)</strong></td>
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<td>As above and:</td>
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<td></td>
<td>Define the role of genetic and environmental factors, obesity, insensitivity to insulin and insulin deficiency in the development of type 2 diabetes.</td>
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<td>Be able to explain the factors that can affect the accuracy of laboratory investigations.</td>
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<td>Illustrate the natural history of diabetes, including the failure of oral blood glucose-lowering agents.</td>
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<td>Know the criteria for considering a diagnosis of neonatal diabetes and when appropriate genetic testing should be undertaken.</td>
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<td>Know how to obtain genetic testing for the various monogenic forms of diabetes (e.g. neonatal and MODY).</td>
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<td>Have knowledge of and be able to screen for and treat associated conditions with type 2 diabetes - hyperlipidaemia, fatty liver, hypertension etc.</td>
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<td><strong>Five (Critical understanding)</strong></td>
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<td>Have knowledge regarding and be able to explain to others about how to treat Type 2 diabetes with glucose-lowering agents.</td>
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<td>Demonstrate understanding and be able to explain to others about the advantages and disadvantages of different glucose-lowering agents.</td>
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<td>Be aware of and be able to explain to others the principles of starting insulin therapy in patients with Type 2 diabetes who have not responded adequately to oral hypoglycaemic agents.</td>
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<td>Be able to distinguish between the different sorts of MODY.</td>
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<td>Know the treatment of the different forms of MODY and neonatal diabetes.</td>
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<td>Be able to treat other forms of diabetes as required.</td>
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<td>Section 4</td>
<td>Insulin therapy</td>
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<td><strong>Level</strong></td>
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<tr>
<td><strong>One (Basic awareness)</strong></td>
<td>Demonstrate awareness of the need for insulin treatment in type 1 diabetes. Understand and be able to explain how insulin doses vary with different stages of diabetes e.g. 'remission period', adolescence etc.</td>
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</tbody>
</table>
| **Two (Factual knowledge)** | **As above and:**
Demonstrate knowledge concerning the various types of insulin and their duration of action.
Be able to discuss the duration of action of different types of insulin.
Demonstrate understanding of the benefits of intensifying insulin therapy in type 1 diabetes.
Be able to identify the source of insulin available in the participants' healthcare setting – pork, beef, human recombinant deoxyribonucleic acid (DNA), analogues.
Recognise the factors affecting insulin requirements and absorption.
Comprehend the benefits and challenges of different insulin regimens e.g. twice or thrice daily, multiple injections, pump therapy etc.
Be able to categorise the appropriate type of insulin and regimen to use in different clinical situations.
Be able to discuss the safe use of insulin, the importance of carrying identity details, knowing the name of the insulins and devices available. |
| **Three (Working knowledge)** | **As above and:**
Be able to safely demonstrate the preparation and administration of insulin using different methods e.g. including syringes, pens etc.
Be able to illustrate the side effects of insulin treatment including hypoglycaemia, insulin oedema, weight gain, lipohypertrophy and lipoatrophy.
Identify and explain individualised treatment goals in terms of blood glucose levels, HbA1c and weight management.
Demonstrate understanding of and be able to explain the principles of insulin dosage adjustment for both basal and bolus insulins.
Review the management of insulin for CYP on pump therapy.
Elucidate how to set and alter basal insulin rates to patients on pump therapy.
Be able to clarify how to change boluses to account for blood glucose levels and carbohydrate intake.
Be able to advise on insulin management for holiday travel.
Know and explain how to store and transport insulin safely. |
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<th>Section 4</th>
<th>Insulin therapy</th>
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<td>Level</td>
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</table>
| **Four (In-depth understanding)** | **As above and:**  
Be knowledgeable about how to teach people how to adjust their insulin dosages in order to achieve their targets for blood glucose control.  
Be able to initiate insulin pump therapy.  
Identify when and how to test basal rates, with consideration of the child’s age and explain this to others.  
Be able to identify and teach others when and how advanced bolus delivery should be used in pump therapy.  
Be able to set and demonstrate to teach others how to set and evaluate the use of different patterns of bolus administration e.g. square waves etc.  
Explain how to alter basal and bolus rates in response to continuous glucose monitoring.  
Be able to set and evaluate the use of correction ratios over a 24 hour period and evaluate the effects of this intervention. |
| **Five (Critical understanding)** | **As above and:**  
Work under a Patient Group Directive or Non Medical prescribing to enable insulin adjustment.  
Investigate all clinical adverse events and report to relevant agencies. Develop an action plan to prevent recurrence.  
Initiate and lead research and promote evidence based practice. |
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<th>Section 5</th>
<th>Complications</th>
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<td>Section 5ai</td>
<td>Identification and treatment of hypoglycaemia</td>
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<td><strong>Level</strong></td>
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</table>
| **One (Basic awareness)** | Be able to recognise and describe signs and symptoms of hypoglycaemia.  
Be able to safely give reassurance to the CYP and family that they can treat mild hypoglycaemia.  
If person is unresponsive, seek assistance.  
Have knowledge how to make appropriate referrals to other members of diabetes Multidisciplinary Team (MDT).  
Maintain professional competence and update regularly. |
| **Two (Factual knowledge)** | **As above and:**  
Demonstrate knowledge that several developments are currently being researched that may lead to novel ways of treating diabetes (e.g. islet cell and pancreas transplantation, ‘closed loop’ insulin pump systems).  
Recognise that electronic databases are increasingly being used to monitor patients and to provide audit data for benchmarking purposes.  
Appreciate the importance of team consistency and goal setting and recognise the importance of a team approach to care with each and every CYP with diabetes. |
| **Three (Working knowledge)** | **As above and:**  
Have ability to competently and safely teach the use of BG monitoring equipment and interpretation of values.  
Demonstrate knowledge of driving regulations and how they relate to hypoglycaemia.  
Identify people at risk of hypoglycaemia and advise and adjust therapy accordingly.  
Demonstrate knowledge of insulin/medications and their contraindications.  
Discuss hypoglycaemia including hypo unawareness and possible cause.  
Be able to educate and to evaluate the effects of your education to CYP and carers on the impact that hypoglycaemia can have (e.g. cognitive function, school, risk, illness management etc).  
Demonstrate competent and safe support to CYP and carers to manage illness, when it causes hypoglycaemia, within the home / school environment.  
Be able to safely manage hypoglycaemia and hypo emergencies e.g. use of glucagel and glucagon.  
Ensure and be able to evaluate that the CYP and carer know when and how to access help appropriately.  
Be able to safely interpret continuous glucose monitoring results to reduce episodes of hypoglycaemia. |
### Section 5 Complications

#### Section 5ai Identification and treatment of hypoglycaemia

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<th>Level</th>
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<tr>
<td><strong>Four (In-depth understanding)</strong></td>
<td>Portray understanding and be able to teach others about the aetiology and management of hypoglycaemia.</td>
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<td>Illustrate knowledge of other medication/oral therapies and other agents that may result in hypoglycaemia and be able to teach others.</td>
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<td>Provide expert advice on complex cases of hypoglycaemia management.</td>
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<td>Act as a resource on hypoglycaemia for other HCP’s.</td>
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<td>Ensure evidence based guidelines are current and available for other HCPs to treat hypoglycaemia across all care settings.</td>
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<td>Have a detailed understanding and be able to teach others about the physiology and biochemical changes that occur as hypoglycaemia develops.</td>
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</table>

<p>| <strong>Five (Critical understanding)</strong>         | Comprehend and be able to identify service shortfalls and develop strategic plans in partnership in managing hypoglycaemia. |
|                                            | Work in collaboration with education providers managing hypoglycaemia.                             |
|                                            | Promote evidence based practice in managing hypoglycaemia.                                         |
|                                            | Develop best practice through leadership and consultancy in managing hypoglycaemia.                |
|                                            | Know how to feed data into national diabetes audit about hypoglycaemia.                            |
|                                            | Initiate and lead research in hypoglycaemia.                                                      |
|                                            | Identify and make differential diagnoses in relation to recurrent hypoglycaemia e.g. Maturity onset diabetes of the young (MODY), coeliac disease, Addison’s disease. |
|                                            | Be competent in providing recommendations for and lead on the emergency management of severe hypoglycaemia. |</p>
<table>
<thead>
<tr>
<th>Section 5</th>
<th>Complications</th>
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</thead>
<tbody>
<tr>
<td>Section 5aii</td>
<td>Hyperglycaemia and Diabetic Ketoacidosis (DKA)</td>
</tr>
</tbody>
</table>

**Level**

**One (Basic awareness)**
- Affirm and recognise the causes of hyperglycaemia and DKA e.g. insulin omission, inter-current illness etc.
- Be able to recognise the signs and symptoms of hyperglycaemia and DKA.
- Consider preventive strategies for DKA.
- Recognise the critical importance of never omitting insulin administration in type 1 diabetes when the person has an inter-current illness.
- Recognise that recurring DKA may be a sign of a social or psychological problem, and discuss strategies for addressing such problems.

**Two (Factual knowledge)**
- As above and:
  - Identify the evidence of how to treat acute episodes of hyperglycaemia.
  - Describe the difference between ketosis and acidosis.
  - Recognise and be able to explain the impact on blood glucose of different types of illness, such as fever or malabsorption.
  - Be able to explain to others the need for regular testing of blood glucose and ketones during an acute illness and evaluate the impact of the same.
  - Recognise the need to adjust insulin according to blood glucose levels and ketones.
  - Demonstrate awareness of the local guidelines and national evidence base for insulin therapy and carbohydrate management during sick days.

**Three (Working knowledge)**
- As above and:
  - Consider strategies for supplying sufficient carbohydrate when appetite is poor and be able to explain to others.
  - Recognise the need to drink enough water and liquids for rehydration, and decreasing activity, when blood glucose is high and be able to teach others.
  - Explain and be able to competently demonstrate to others how to adjust insulin to correct hyperglycaemia.
  - Be able to demonstrate how to calculate insulin sensitivity factor and explain this to others.
  - Describe when medical or hospital intervention is necessary.
### Section 5 Complications

#### Section 5aii Hyperglycaemia and Diabetic Ketoacidosis (DKA)

<table>
<thead>
<tr>
<th>Level</th>
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<tbody>
<tr>
<td><strong>Four (In-depth understanding)</strong></td>
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<tr>
<td><strong>As above and:</strong></td>
<td>Be familiar with the potential acute complications of DKA.</td>
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<tr>
<td></td>
<td>Be able to recognise the acute complications of DKA e.g. cerebral oedema, electrolyte changes etc and follow evidence based treatment protocols safely.</td>
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<td></td>
<td>Be familiar with both local and national or international guidelines for the treatment of DKA and how they may differ.</td>
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<td></td>
<td>Know when a child needs to be admitted to Paediatric Critical or Intensive Care for treatment of DKA.</td>
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<tr>
<td></td>
<td>Demonstrate competency and knowledge of how to change from intravenous to subcutaneous insulin as DKA improves.</td>
<td></td>
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</tbody>
</table>

<p>| <strong>Five (Critical understanding)</strong> | | |
| <strong>As above and:</strong> | Be able to treat mild, moderate and severe DKA according to accepted guidelines and evaluate the impact of the same. |
|  | Demonstrate the ability to treat the acute complications, particularly cerebral oedema and be able to teach others. |
|  | Be able to recognise and appropriately treat cerebral oedema and inform others. |
|  | Demonstrate detailed understanding of the biochemical and physiological changes that occur during both the development and treatment of DKA. |</p>
<table>
<thead>
<tr>
<th>Section</th>
<th>Complications</th>
<th><strong>Eye complications</strong></th>
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<tbody>
<tr>
<td><strong>Level</strong></td>
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<tr>
<td>One (Basic awareness)</td>
<td></td>
<td>Be familiar with the fact that diabetes, especially if poorly controlled, carries an increased risk of long-term complications including retinopathy.</td>
</tr>
<tr>
<td>Two (Factual knowledge)</td>
<td><strong>As above and:</strong></td>
<td>Be able to describe the epidemiology of diabetic retinopathy, including rates of incidence and prevalence. Be able to counsel parents of CYP and adults about the risks of developing retinopathy and know safe evidence based strategies to reduce the risk. Be able to reassure the person that blurred vision associated with poor metabolic control is likely to be transient and will be resolved with improved control. Identify the normal anatomy of the eye. Have knowledge about the importance of testing visual acuity. Be aware of the need for regular screening at an appropriate age. Portray knowledge concerning the increased frequency in the development of cataracts at an earlier age in people with diabetes.</td>
</tr>
<tr>
<td>Three (Working knowledge)</td>
<td><strong>As above and:</strong></td>
<td>Demonstrate knowledge concerning the importance of intensive glycaemic and blood pressure control therapy in influencing the development or progression of retinopathy. Illustrate knowledge concerning the predictors of the development of retinopathy and the natural history of the disease. Acknowledge and be aware of the psychosocial impact of visual loss for the person with diabetes and their relatives. Know the criteria for regular screening for eye complications in children.</td>
</tr>
<tr>
<td>Four (In-depth understanding)</td>
<td><strong>As above and:</strong></td>
<td>Be knowledgeable about what services exist for eye screening and ophthalmology referral. Be aware that tightening control of diabetes may cause an initial deterioration of retinopathy and be able to inform others. Have an understanding of the different grades of retinopathy and be able to teach others. Be competent to perform retinal examination (dilated pupils) and recognise changes of diabetic retinopathy or cataracts, particularly sight threatening changes and refer on appropriately. Consider other rare forms of diabetes that may be associated with eye abnormalities. Be aware of potential therapies that are available for eye complications and be able to inform others.</td>
</tr>
<tr>
<td>Five (Critical understanding)</td>
<td><strong>As above and:</strong></td>
<td>Identify shortfalls in service and be able to address these in partnership. Lead on audit of eye screening.</td>
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# Section 5 Complications

## Section 5aiii Nephropathy

<table>
<thead>
<tr>
<th>Level</th>
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<tbody>
<tr>
<td>One (Basic awareness)</td>
<td>Be familiar with the fact that diabetes, especially if poorly controlled, carries an increased risk of long-term complications including nephropathy.</td>
</tr>
</tbody>
</table>
| Two (Factual knowledge) | As above and:  
Be able to describe predictors of the development of nephropathy and the natural history of the disease.  
Portray knowledge concerning the transient nature of microalbuminuria and the causes of transient increases in albumin excretion.  
Affirm knowledge regarding the diagnostic tests used in screening for kidney disease.  
Consider the impact of microalbuminuria in type 1 diabetes and type 2 diabetes.  
Demonstrate knowledge that microalbuminuria is a marker for vascular dysfunction and possibly vascular disease.  
Acknowledge and be aware of the psychosocial impact of chronic kidney disease on people with diabetes and their relatives.  
Be aware of the need for regular screening at an appropriate age.  
Have awareness concerning possible dietary changes with the progression of kidney failure and work with appropriate HCPs to manage this safely. |
| Three (Working knowledge) | As above and:  
Be able to establish working knowledge regarding the various intervention studies demonstrating the benefits of improving glycaemic control – including the Diabetes Control and Complications Trial (DCCT) and UKPDS and evaluate the effects of these studies on your practice.  
Be able to counsel parents of CYP about the risks of developing nephropathy associated with poor glycaemic control and offer options for them.  
Be able to competently describe the relationship between hypertension and the progression of kidney disease in diabetes.  
Demonstrate safe evidence based approaches regarding the importance of blood pressure control in the prevention and management of diabetic kidney disease.  
Be knowledgeable about the evidence base of why ACE inhibitors and angiotensin II receptor blockers (ARBs) are first-line treatment for people with diabetic kidney disease.  
Know the criteria for regular screening for renal complications in children and demonstrate knowledge regarding appropriate referral to other HCPs. |
| Four (In-depth understanding) | As above and:  
Portray understanding of the pathophysiological basis that underpins nephropathy and be able to teach others.  
Be able to initiate and review ACE inhibitor or ARB therapy where appropriate based on evidence.  
Affirm awareness of potential side effects of therapy and specific need for counselling females of reproductive age and be able to inform others.  
Consider other rare forms of diabetes that may be associated with renal abnormalities and be able to explain to others. |
| Five (Critical understanding) | As above and:  
Identify shortfalls in service and be able to address these through partnership working.  
Lead on audit of nephropathy screening. |
<table>
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<tr>
<th>Section 5</th>
<th>Complications</th>
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<tbody>
<tr>
<td><strong>Section 5a</strong></td>
<td>Neuropathy, Macrovascular and Dental disease</td>
</tr>
<tr>
<td><strong>Level</strong></td>
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<tr>
<td>One (Basic awareness)</td>
<td>Be aware that young people and adults have an increased risk of developing neuropathy and why. &lt;br&gt;Be aware of the increased risk of macrovascular events in people with diabetes and be able to recognise the same.</td>
</tr>
<tr>
<td>Two (Factual knowledge)</td>
<td><strong>As above and:</strong> &lt;br&gt;Portray knowledge concerning the impact of autonomic neuropathy on quality of life. &lt;br&gt;Assess adolescents ability to care for their feet and be able to refer on as needed to appropriate HCPs. &lt;br&gt;Recognise and follow evidence based appropriate self-care practices taught to people with diabetes such as selecting and wearing appropriate footwear, correct cutting of toenails, rapid and safe treatment of minor foot ailments such as tinea, veruccae etc. &lt;br&gt;Affirm knowledge and evidence regarding manifestations of macrovascular disease that vary between different ethnic groups. &lt;br&gt;Recognise central obesity as a marker for increased vascular risk. &lt;br&gt;Be able to give evidence based explanations for the need for regular blood pressure checks. &lt;br&gt;Be able to give evidence based explanations for the need for regular foot checks. &lt;br&gt;Demonstrate knowledge regarding the increased risk of dental caries in people with diabetes and explain the need for regular dental checks. &lt;br&gt;Advise on where to obtain appropriate treatment for foot ailments.</td>
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<tr>
<td>Three (Working knowledge)</td>
<td><strong>As above and:</strong> &lt;br&gt;Demonstrate evidence based knowledge concerning the increased risk of macrovascular disease in the presence of microalbuminuria/nephropathy, and the need for intensive management of macrovascular risk factors. &lt;br&gt;Be able to describe and explain the different types of lipids and targets for treatment as per national and international evidence based guidelines. &lt;br&gt;Have knowledge concerning the role of lifestyle factors in therapy (regular exercise, smoking cessation, sustained weight loss for the overweight) healthy diet, and be able to inform others. &lt;br&gt;Know when and how to make appropriate referral for 24 hour blood pressure monitoring. &lt;br&gt;Know when and how to make appropriate referral to registered podiatry services. &lt;br&gt;Be aware of the different presentations of neuropathy in diabetes and need for further assessment. &lt;br&gt;Be able to describe and teach others regarding the evidence supporting the role of lowering blood pressure in reducing the risk of cardiovascular events. &lt;br&gt;Have competent knowledge concerning the benefits of intensive management of dyslipidaemia and hypertension and be able to inform others.</td>
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## Section 5 Complications

### Section 5av Neuropathy, Macrovascular and Dental disease

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<thead>
<tr>
<th>Level</th>
<th>Description</th>
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| **Four (In-depth understanding)**          | As above and:  
Demonstrate knowledge and ability to perform appropriate tests to determine diabetic neuropathy and macrovascular changes and be able to inform others.  
Demonstrate understanding that, in type 1 diabetes, obesity may contribute to increased insulin resistance and be able to teach others.  
Demonstrate recognition of significant dyslipidaemia as opposed to predictable derangement caused by poor diabetes control and appropriate referral to other HCPs.  
Be able to safely and competently initiate and review effect of lipid-lowering agents where appropriate.  
Demonstrate awareness of potential side effects of therapy and specific need for counselling females of reproductive age. |
| **Five (Critical understanding)**          | As above and:  
Identify shortfalls in service and be able to address these through partnership working.  
Lead on audit of lipid screening.                                                                                                                                                                      |
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<tr>
<th><strong>Section 6</strong></th>
<th><strong>Defining the Multi-disciplinary Team (MDT) and delivery of ambulatory services</strong></th>
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<td><strong>Level</strong></td>
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</table>
| **One (Basic awareness)** | Be able to describe and clearly define the roles and responsibilities and clear targets of the core multi-disciplinary team (Paediatrician with a special interest, paediatric diabetes specialist nurse; paediatric diabetes dietitian, clinical psychologist, social worker), the extended interdisciplin ary team and the essential position that the child and family play at the core of the team.  
Have a shared vision and understanding of a defined and documented philosophy that is culturally sensitive to the population served by the MDT and adhered to in their everyday practise.  
Contribute to a clearly defined data set that is collected and linked to diabetes outcomes on an annual basis.  
Be aware of new therapies and technologies as diabetes management evolves.  
Be able to recognise and acknowledge understanding of the developmental and psychosocial needs of the family in order to contribute to the care and adjustment to diabetes at different developmental stages.  
Be aware of ongoing contributions to advancing clinical practice through development and evaluation of new technologies and the optimal application of new and existing technology in clinical practice.  
Contribute to the development of strong links, clear communication, and common working practices with the CYP and family at home; the young person at school or college; primary health care providers other paediatricians and health care providers in areas of low population density/low diabetes.  
Participate in a regular review of the responsibilities of the MDT as a service provider, annually examining the structure, process and outcomes of the service, and including all criteria identified in the Best Practice Tariff.  
Keep up to date with research in diabetes and be able to communicate to CYP, their families and other members of the MDT.  
Demonstrate ongoing evaluation of safe practice.  
Provide general level 1 psychosocial support for the child and family. |
| Two (Factual knowledge) | **As above and:**  
Be informed about and be able to provide information that is age, maturity and culturally appropriate in all aspects of diabetes.  
Demonstrate understanding of the evidence base and operational structure for clinical management systems to ensure adequate access and communication with the CYP and family.  
Be competent and have the knowledge to be able to provide safe and specific practical education, blood glucose monitoring and safe storage of insulin and sharps.  
Be able to develop skills and become competent to contribute to patient education under supervision from a senior team member.  
Aim to take part in the delivery of a diabetes camp to extend knowledge, skills and competencies in the daily living of diabetes management. |
| Three (Working knowledge) | **As above and:**  
Be able to competently and safely teach the adjustment of insulin, carbohydrate counting and the setting of insulin: carbohydrate ratios and pump therapy and evaluate the same.  
Be proficient to contribute and organise data for the collection of the national diabetes audit. |
<table>
<thead>
<tr>
<th>Section 6</th>
<th>Defining the Multi-disciplinary Team (MDT) and delivery of ambulatory services</th>
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<tbody>
<tr>
<td><strong>Level</strong></td>
<td><strong>Four (In-depth understanding)</strong></td>
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<tr>
<td></td>
<td>As above and: Be safe and demonstrate competency to assess all medication, monitoring and lifestyle issues to negotiate appropriate individualised care plans and be able to review the same in partnership with CYP &amp; their families / carers. Act as a professional resource for the MDT &amp; the IDT. Review possible service shortfalls and be able to inform others appropriately. Be a participant in strategic plans to improve services. Work in collaboration with other team members and CYP and the family to gather facts to achieve the most appropriate care plan and be able to review the same. Demonstrate delivery of agreed care practices by the MDT and on-going care in various settings e.g. home, schools, care homes. Develop evidenced based best practice through leadership and consultancy and national standardisation and inform others. Identify psychological disturbance and provide both training for the team and psycho-therapeutic intervention at level 3 and 4. Contribute as an independent practitioner into the patient caseload and to the business of the MDT. Provide data into national diabetes audit. Identify barriers to excellent care in other situations, e.g. schools and take steps to overcome them. To be responsible for clinical assessments and the psycho-social wellbeing of the child including the annual review, and action to be taken if there are safe guarding issues around the child’s welfare. To be responsible for assessing education and self-care behaviour and develop strategies to meet any deficits that are evident (these strategies should be evidence based and patient centred). To contribute to the individualised written plan of diabetes care incorporating all aspects of care, education and the particular needs of each CYP and family designed to optimise the child’s diabetes outcomes.</td>
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<tr>
<td><strong>Level</strong></td>
<td><strong>Five (Critical understanding)</strong></td>
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<td>As above and: Initiate the treatment at diagnosis (with accepted written protocols for management of diabetic ketoacidosis) and other presentations of childhood diabetes and evaluate the impact of this. Play a leadership role in the integrated, cohesive multi-disciplinary team and the extended interdisciplinary team. Identify service shortfalls and develop strategic plans in partnership to address identified shortfalls. Work in collaboration with higher educational institutes and other education providers to meet educational needs of the MDT. Work in collaboration with educational institutions and local education authorities to provide excellent care at schools and early years settings. Initiate and lead research and promote evidence-based practice. Develop best practice, for example through leadership and consultancy. Work with stakeholders to develop and implement local guidelines and interventions, promoting evidence-based practice and cost-effectiveness. To be responsible for the delivery and management of data into National and International Diabetes Audit/s. Develop and ensure delivery of evidence for effective peer review systems. Act as a resource and service lead strategically for the service.</td>
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<tr>
<td><strong>Section 7</strong></td>
<td><strong>Education of children and young people and carers</strong></td>
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| **One (Basic awareness)** | Demonstrates awareness of and understand the age, maturity and developmental stages of CYP and the implications of this for communication and learning.  
Be aware and understand how to gather information from CYP and their families about their health.  
Have a working knowledge of the social, cultural and economic background of the patient group that you manage.  
Have an understanding and be able to recognise the psychological impact of diabetes on CYP and their families at diagnosis and in the long term.  
Describe and assess the learning needs of the CYP and their family and who to refer to for further education.  
Portray understanding of the educational process that the CYP and their family will undertake from diagnosis. |
| **Two (Factual knowledge)** | **As above and:**  
Be able to explain the importance of diabetes self-management education (DSME) to others.  
Be able to demonstrate knowledge about the pathophysiology of diabetes.  
Be able to deliver basic diabetes education to individual CYP and their families.  
Be able to identify the barriers to learning and enabling factors to teaching.  
Be able to identify the various agencies who are involved in order to plan education. |
| **Three (Working knowledge)** | **As above and:**  
Have knowledge how to and be able to undertake an age appropriate learning needs assessment.  
Be able to recognise and adapt to the preferred learning style.  
Demonstrate knowledge of how children learn and the optimal learning environment and aim to provide the same.  
Be able to identify the age appropriate educational resources to support any teaching sessions and evaluate their use.  
Demonstrate understanding of the need for specific aims and objectives in the educational programme that are shared with the CYP and their family.  
Understand the need for and engage within peer review as part of the development of an educational curriculum.  
Be able to undertake an evaluation of the self-management education that has been provided. |
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<tr>
<th>Section 7</th>
<th>Education of children and young people and carers</th>
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<tr>
<td><strong>Level</strong></td>
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</table>
| **Four (In-depth understanding)** | **As above and:**  
Have an in-depth knowledge of childhood learning theories and their application in practice.  
Be trained and competent in the delivery of an educational curriculum which is theory based and flexible and evaluate the effectiveness of the same.  
Understand the strengths and weaknesses of different teaching environments i.e. small group work, individual and large groups and use a variety of approaches to suit all learners needs.  
Be able to develop and evaluate age appropriate, theory based teaching packages and review their impact.  
Have an in-depth understanding of how to develop age appropriate teaching tools in partnership with others.  
Be able to ensure equal learning opportunities for all CYP involved in group teaching and reflect on the impact of these.  
Understand the different types of evaluation and when they are best used.  
Be involved in the assessment and audit of educational programmes in partnership with others.  
Have an in-depth understanding and be able to recognise the psychological impact of diabetes on CYP and their families and refer on as appropriate.  
Be able to provide education and support to siblings and parents to ensure sound family functioning and review the impact of this.  
To provide effective education to other agencies such as schools, nurseries, clubs and review the impact of this. |
| **Five (Critical understanding)** | **As above and:**  
Provision of practical care evidence based guidance at diagnosis including the education required to allow the family to undertake diabetes self-management at home with an initial understanding of the pathophysiology of diabetes and its treatment. Review the impact of the same at regular intervals for individuals in your care.  
Ensure internal and external quality assurance standards are met.  
Be involved in educational research.  
Act as a resource and service lead strategically within the trust and with other agencies involved with the CYP and their families. |
<table>
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<tr>
<th><strong>Section 8</strong></th>
<th><strong>Nutrition</strong></th>
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</thead>
</table>
| **Level** | **One (Basic awareness)** | Demonstrate understanding of the social and psychological importance of food.  
Be able to describe the constituents of a healthy well balanced diet in recognition of food standard agency and the latest evidence based guidance in diabetes.  
Appreciate that regular dietary review is essential due to the constant changing needs of a growing and developing child.  
Recognise the role of carbohydrate (CHO) foods in a balanced diet and be able to inform others.  
Recognise the significance of CHO in a diabetes management programme.  
Demonstrate understanding of the importance of nutrition in the management of diabetes alongside insulin and physical activity.  
Be able to identify all sources of CHO in foods.  
Make appropriate referral to other members of the diabetes MDT or know how to access dietetic services.  
Be aware of the difference in dietary management between type 1 and type 2 diabetes in children and young people.  
Appreciate age related eating patterns, issues, eating problems and dysfunctional eating behaviour and work in partnership with others.  
Measure and record height and weight accurately, monitor normal growth, ensure appropriate energy balance and refer on as needed. |
| **Two (Factual knowledge)** | **As above and:**  
Identify and develop knowledge concerning the familial, social, cultural, psychological context of food intake and food choices in the population you serve.  
Identify the role of sugars, alternative sweeteners and diabetic foods in a healthy diet and be able to inform others appropriately.  
Be able to describe evidence based strategies for weight management.  
Recognise family life style behaviours that influence total energy intake of the child.  
Assess, through discussion with the CYP and families, their understanding of CHO foods.  
Know how to access information regarding CHO values using a variety of resources (locally produced information, web based, commercially available books, weighing food).  
Be knowable and demonstrate how to calculate a prescribed dose of insulin based on an insulin:carbohydrate ratio and a given amount of CHO. |
| **Three (Working knowledge)** | **As above and:**  
Gather information to develop a thorough understanding of the diet and eating patterns, and any difficulties in eating in partnership with others.  
Have knowledge of how to work with individuals and groups to identify realistic and achievable dietary changes in conjunction with specialist dietetic services.  
Assess through discussion with the CYP and families, their understanding of CHO foods and review this at regular intervals. |
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<th><strong>Section 8</strong></th>
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<tr>
<td><strong>Level</strong></td>
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<td></td>
<td>Able to teach CHO counting techniques to groups or individual CYP and families and evaluate these charges.</td>
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<td>Able to quantify CHO in food using grams or CHO portions as per local protocol.</td>
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<td>Liaison with carers/schools/nurseries/residential centres about CHO content of provided meals.</td>
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<td>Be involved with educating ward staff/other professionals in CHO management.</td>
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<td>Portray knowledge about the effect of diet on micro and macro vascular complications.</td>
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<td>Demonstrate knowledge about the dietary factors that affect blood pressure and blood lipid control.</td>
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<td>Comprehend about glycaemic index of CHO food in relation to blood glucose values.</td>
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<td>Be able to offer education and advice to families on adapting their diet to achieve target glycaemic control and reduce macrovascular complications.</td>
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<td>Be knowledgeable and be able to demonstrate this knowledge safely concerning other conditions concurrently with diabetes (e.g. coeliac disease, enteral feeding).</td>
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<td>Be aware of and sensitive to the influence of society, culture and religion on eating patterns, beliefs and myths about various foods.</td>
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<tr>
<td>Four (In-depth understanding)</td>
<td><strong>As above and:</strong></td>
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<tr>
<td></td>
<td>Be competent to apply your knowledge and skills of behaviour change techniques to help achieve individualised nutrition targets in partnership with children, young people and their families / carers.</td>
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<td></td>
<td>Demonstrate ability to recognise and manage abnormal, dysfunctional, controlled eating behaviour and make appropriate referrals if severe psycho-pathology is identified.</td>
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<td>Act as a local advisor on the dietary management of children’s diabetes.</td>
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<td>Be able to demonstrate knowledgeably and apply this to being able to explain the advantages of different insulin regimens, when considering dietary issues.</td>
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<td>Be involved with others to produce local nutrition protocols and resources.</td>
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<td></td>
<td>Act as a local resource on the dietary management of children’s diabetes.</td>
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<tr>
<td>Five (Critical understanding)</td>
<td><strong>As above and:</strong></td>
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<td>Recognise service shortfalls and develop strategic plans to address them with others.</td>
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<td>Work in collaboration with higher educational institutes and other education providers to meet educational needs of MDT members.</td>
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<td></td>
<td>Act as a resource and advise on the dietary management of children’s diabetes at a regional or national level.</td>
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<td>Initiate and lead nutrition related research, publish results and promote evidence-based practice.</td>
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<td>Work with stakeholders in partnership to develop and implement local, regional or national, audit, guidelines and interventions, promoting evidence-based practice and cost-effectiveness.</td>
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<tr>
<td>Section 9</td>
<td>Management of physical activity and exercise</td>
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<td><strong>Level</strong></td>
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</table>
| **One (Basic awareness)** | Be familiar with and describe the health benefits of having an active lifestyle.  
Be able to define government evidence based recommendations on exercise and activity levels for health promotion in children.  
Demonstrate that exercise will have an impact on glycaemic control for CYP.  
Be able to define both exercise and physical activity.  
Recognise how and when to make appropriate referral to other members of the diabetes MDT.  
Maintain professional competence and update regularly. |
| **Two (Factual knowledge)** | **As above and:**  
Illustrate understanding of the effects of different activities on blood glucose levels.  
Be competent to give basic advice about hypoglycaemia prevention during and after exercise.  
Be able to advise regarding regular carbohydrate intake and action of insulin across the day.  
Have knowledge about and be able to explain to others how additional types of carbohydrate can be used to prevent hypoglycaemia as a result of prolonged exercise. |
| **Three (Working knowledge)** | **As above and:**  
Identify and be competent to explain safely to others that different types and duration of exercise may have an impact during and/or after completion of exercise.  
Be able to offer comparisons of the impact of aerobic and anaerobic activity on blood glucose levels.  
Be able to educate CYP and families in exercise management strategies using carbohydrate and basic insulin adjustment. |
| **Four (In-depth understanding)** | **As above and:**  
Be able to knowledgeably and competently educate CYP, families and other HCP’s on exercise management strategies using both CHO and advanced insulin management.  
Be able to develop a nutritional management plan for training, working in partnership with other key stakeholders.  
Be able to safely calculate Resting Energy Expenditure (REE) using appropriate predictive formulas and explain this to others.  
Be able to calculate energy requirements for specific activities safely and competently.  
Be aware of and recognise how to promote evidence based practice to others.  
Produce local resources and protocols with other key stakeholders in partnership.  
Work under a Patient Group Directive or non medical prescribing or similar to enable insulin adjustment for exercise.  
Recognise when and how to refer to a tertiary exercise service for specialist patient specific advice.  
Participate in research or contribute to publications if necessary. |
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<thead>
<tr>
<th><strong>Section 9</strong></th>
<th><strong>Management of physical activity and exercise</strong></th>
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<tr>
<td><strong>Level</strong></td>
<td>As above and:</td>
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<tr>
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<td>Demonstrate current evidence based knowledge concerning exercise physiology, fuel selection during exercise and type 1 diabetes and be able to inform others.</td>
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<td>Have an in depth knowledge of sport &amp; exercise nutrition in CYP including knowledge of management strategies for competition, travel and training needs.</td>
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<td>Have an in depth evidence based knowledge of effects of environment on nutritional needs.</td>
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<td>Be able to teach implications of having diabetes and the need to declare this when taking part in elite sports activities.</td>
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<td>Be competent in developing effective individual management strategies that encompass nutrition and medication adjustment.</td>
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<td>Be able to provide appropriate anti doping advice.</td>
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<td>Act as a regional/national resource for exercise &amp; physical activity management.</td>
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<td>Contribute to professional education.</td>
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## Section 10 Monitoring of Diabetes and screening for associated conditions

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| **One (Basic awareness)** | Demonstrate knowledge and understanding that monitoring of blood glucose plays an important part in the management of diabetes.  
Be able to explain the need for regular blood glucose testing to others.  
Develop and have awareness that more regular, frequent blood glucose testing is associated with better diabetes control.  
Recognise and understand the need for regular measurements of glycated haemoglobin.  
Be knowledgeable that there are occasions when additional testing of ketones may be important.  
Demonstrate understanding that glycated haemoglobin measurement constitutes the ‘gold standard’ for diabetes control.  
Understand and develop recognition that lower targets for glycated haemoglobin lead to improved diabetes control as long as hypoglycaemia is not a regular occurrence.  
Know and be able to cite the national targets for glycated haemoglobin to others. | |
| **Two (Factual knowledge)** | **As above and:**  
Recognise and be able to explain when Continuous Glucose Monitoring (CGM) may be of value in certain circumstances.  
Know and be able to cite what levels of glycated haemoglobin are unacceptable, acceptable and ideal for individual CYPs circumstances.  
Be able to explain what glycated haemoglobin is and what is its significance.  
Demonstrate an understanding of the differences between glycated haemoglobin and other measures of long term control.  
Distinguish the differences between blood ketones and urine ketones and how to test for them.  
Identify when to recommend blood or urine ketone measurement.  
Recognise the importance of regular measurements of height and weight and of calculating Body Mass Index.  
Be able to describe how poor growth may be a consequence of suboptimal glycaemic control.  
Discern the importance of regular blood pressure checks and explain to others.  
Demonstrate knowledge concerning the differences between Real Time and retrospective CGM and the advantages and disadvantages of each method.  
Comprehend and demonstrate safe current knowledge concerning the need for regular checks of insulin injection sites.  
Demonstrate to others the evidence base for need for regular ophthalmic and foot examinations. | |
## Section 10

### Monitoring of Diabetes and screening for associated conditions

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<tr>
<td>Three (Working knowledge)</td>
<td>As above and:</td>
<td>Be competent with current technologies and able to safely attach, disconnect and upload/download continuous glucose monitors and be able to explain how to use to CYP.</td>
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<tr>
<td>Four (In-depth understanding)</td>
<td>As above and:</td>
<td>Demonstrate evidence based knowledge regarding which CYP require regular ophthalmic checks and foot checks in accordance with national and international guidelines.</td>
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<tr>
<td>Five (Critical understanding)</td>
<td>As above and:</td>
<td>Be able to demonstrate safe evidence based treatment strategies and be able to inform others of the same.</td>
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<tr>
<td>Level</td>
<td>Psychological aspects</td>
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| **One (Basic awareness)** | Be able to estimate the developmental level of CYP.  
Demonstrate knowledge concerning the factors that influence intellectual, emotional and social development in CYP.  
Be able to take a basic psychosocial history accurately and sensitively.  
Comprehend and recognise the impact of diabetes on parents and the rest of the family.  
Be able to appreciate the factors that affect a child and families level of anxiety about diabetes.  
Be competent at communicating the diagnosis of diabetes using appropriate language, empathy and self reflexivity.  
Encompass and use effective communication skills specific to working with babies, CYP and families and reflect on the same.  
Be able to involve both the child and parents when both are present in the consultation. |
| **Two (Factual knowledge)** | **As above and:**  
Be knowledgeable and competent in using psychological approaches demonstrated to be effective in engaging CYP in developing appropriate diabetes self-management skills.  
Recognise and distinguish the effects of differing parenting models on diabetes management.  
Be able to discuss the impact of diabetes related anxieties (e.g. fear of hypoglycaemia) on diabetes self-management with CYP and families.  
Understand the impact of systemic factors e.g. family conflict, peer groups, social environment and discrimination on diabetes self-management in CYP.  
Be able to recognise and describe psychological factors that contribute to the development of self-efficacy.  
Be able to contribute to an assessment of psychological functioning.  
Recognise and distinguish signs and symptoms of emotional distress or behavioural difficulties that require referral to a mental health professional.  
Be able to constructively discuss consultations that have either gone well or proven challenging with other team members and reflect on practice. |
| **Three (Working knowledge)** | **As above and:**  
Be knowledgeable about and describe the evidence for different psychological approaches that have been shown to be effective in helping CYP and families managing the emotional impact of diabetes.  
Recognise and be able to implement strategies for managing common behaviour problems that might be impacting upon diabetes self-management.  
Be competent in the use of basic motivational interviewing and motivational enhancement techniques.  
Contribute to complex interventions as part of a MDT. |
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<tr>
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<th><strong>Psychological aspects</strong></th>
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<td><strong>Four (In-depth understanding)</strong></td>
<td><strong>As above and:</strong> Be able to complete a systematic assessment using standardised instruments, systematic interviewing procedures and other structured methods of assessment to inform a psychological formulation. Be familiar with and able to choose, use and interpret a broad range of assessment methods appropriate to the CYP and families and to the type of intervention that is likely to be required. Be able to competently develop a formulation of presenting problems or situations which integrate information from assessments within a coherent framework that draws upon psychological theory and evidence and incorporates interpersonal, social, cultural and biological factors. Be able to competently and safely use the formulation to plan appropriate interventions that take into account the wishes of the CYP and their family. Recognise when to revise the formulation in the light of ongoing intervention and when necessary re-formulate the problem. Be able to competently and safely implement psychological therapy or other intervention appropriate to the presenting problem and to the psychological and social circumstances collaboratively with CYP and families and evaluate on the impact of the same.</td>
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<td><strong>Five (Critical understanding)</strong></td>
<td><strong>As above and:</strong> Be skilled and safe to select and implement appropriate methods to evaluate the effectiveness, acceptability and broader impact of interventions in order to inform and shape practice. Identify and critically appraise research evidence relevant to practice and implement the same. Conduct service evaluation with key stakeholders. Conduct collaborative and independent research in partnership with others. Prepare and deliver teaching and training which takes into account the needs and goals of the participants. Use supervision to reflect on practice and make use of feedback received. Work with users and carers to facilitate their involvement in service planning and delivery.</td>
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<tr>
<td>Level</td>
<td>Surgery, Fasting and Sick Day Rules</td>
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| **One (Basic awareness)** | Comprehend and recognise that, in the event of surgery being required, special precautions are needed to ensure the safety of that surgery for the CYP concerned.  
Be knowledgeable that, for a variety of reasons, fasting for variable periods of time may be required.  
Demonstrate understanding that, in the event of inter-current illness, diabetes control may be altered as a result of the stress imposed caused by that illness.  
Demonstrate understanding that poorly controlled diabetes may predispose to inter-current infections. |
| **Two (Factual knowledge)** | As above and:  
Be able to offer explanations of how CYP who wish to fast for religious reasons may do so if they follow appropriate guidelines.  
Be able to provide current evidence based education on the need to alter insulin in the event of surgery.  
Be able to advise about alterations of insulin safely during inter-current illness.  
Be knowledgeable about the response of glycaemia to inter-current illness that it may be variable.  
Provide competent and current advice about the need to adjust insulin during periods of fasting. |
| **Three (Working knowledge)** | As above and:  
Be able to describe the metabolic changes that occur during surgery.  
Recognise and be able to explain the relationship between glycaemia and wound healing.  
Explain and demonstrate understanding of the stress hormone response and effects on glycaemia.  
Discuss the different principles of management reflecting the current evidence base for people with type 1 diabetes and type 2 diabetes undergoing fasting and surgery. |
| **Four (In-depth understanding)** | As above and:  
Be competent and demonstrate current evidence based knowledge regarding decision making for the safe management of the different regimens for management of CYP on blood glucose-lowering agents and/or insulin.  
Be knowledgeable about the different approaches for the management of minor versus major procedures and explain to others.  
Be able to describe effective post-procedural strategies, including the management of blood glucose, discharge planning, rehabilitation and follow-up appointments.  
Develop and update specific guidelines for diabetes management during surgery in partnership with key stakeholders.  
Be competent to safely manage and describe the principles of treating inter-current illness (e.g. treat the underlying disease if possible, maintain hydration, use of sugar free medicines etc).  
Be able to safely explain how to alter insulin administration and calorie intake during inter-current illness to others and evaluate the effect of the same. |
| **Five (Critical understanding)** | As above and:  
Be skilled and safe to select and implement appropriate methods to evaluate the effectiveness, acceptability and broader impact of interventions in order to inform and shape practice.  
Identify and critically appraise research evidence relevant to practice and implement the same.  
Conduct service evaluation with key stakeholders.  
Audit local and national guidelines for surgery. |
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<th>Young people and Transition to Adult Care</th>
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| **One (Basic awareness)** | Be conscious of a young person being in transition from child to adult.  
Be aware that a young person is a process that may begin at ten years of age and continues until the early 20’s.  
Be aware that a young person encompasses a range of physical, behavioural and emotional changes.  
Have a basic understanding of the education system applicable to a young person.  
Have a basic understanding of the local diabetes services available to children and young people.  
Recognise the purpose of an organised transition between paediatric and adult diabetes services. |
| **Two (Factual knowledge)** | **As above and:**  
Be able to describe the usual growth patterns of male and females during a young persons life.  
Illustrate understanding of normal male and female sexual development.  
Offer explanations of how dietary requirements and eating behaviours change during a young persons life.  
Give reasons for how the hormonal changes occurring during a young persons life directly affect insulin requirements.  
Be able to recognise usual and predictable emotional and behavioural changes that occur during a young persons life.  
Consider the effect on diabetes control that behavioural and emotional changes may cause.  
Know the normal progression through the education system especially examination and transitions i.e. school/university/work.  
Know the current important regulations and restrictions of employment and activity that apply to young people with diabetes.  
Have experience of different consultation styles and techniques that may be needed to engage young people.  
Recognise the importance of peer group support |
| **Three (Working knowledge)** | **As above and:**  
Be knowledgeable about and be able to describe developmental theories applied to young people.  
Be able to advise appropriately on changing insulin requirements during this time.  
Be able to assess and advise on dietary needs.  
Effectively communicate and liaise with colleagues in adult services to ensure smooth transition of care and be able to evaluate the same.  
Discuss and support the planning of transition of diabetes care from CYP/young adult/adult services in conjunction with young people and their families.  
Demonstrate knowledge of driving regulations and how they relate to young people.  
Be able correctly to advise a young person of current employment restrictions relating to diabetes.  
Be able correctly to advise young people and educationalists on appropriate management during higher examinations.  
Be capable of using a variety of consultation styles and techniques during clinical interactions depending on the circumstances.  
Have knowledge of therapeutic strategies within the adult service to support development of seamless care during transition.  
Have current evidence based knowledge of sexual health, contraception, pre-pregnancy planning & as necessary make appropriate referral for safe. |
### Section 13

**Adolescence and Transition to Adult Care**

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|       | Management during pregnancy.  
      Be able to offer education and support to inform young people + carers on the impact that this stage can have on diabetes management.  
      Be able to offer education and advice to young people + carers on the effects of alcohol and recreational drugs on diabetes and how to reduce risk. |
| Four (In-depth understanding) | As above and:  
Demonstrate evidence based practice and key decision making to develop strategies to manage young people in crisis i.e. recurrent Diabetes Ketoacidosis and involve key MDT members as appropriate.  
Be able to recognise disorders of growth and sexual development during this time and make appropriate referrals.  
Demonstrate recognition and awareness of other medical conditions specific to this time e.g. acne and offer support.  
Be competent to provide expert advice on complex cases including issues related to driving in accordance with the law and current DVLA driving regulations.  
Be competent and able to employ advanced techniques for management of change behaviours as required.  
Identify service shortfalls and work with adult services to provide effective transition in collaboration.  
Work in collaboration with education providers. |
| Five (Critical understanding) | As above and:  
Be able to initiate, lead and implement research into this area of care and effective models of transition.  
Develop and demonstrate best practice through leadership and consultancy.  
Promote access to more advanced psychological support for young people and their families as required.  
Be competent to provide support to other units in the development of a transition services as a local and national lead, working with others.  
Act as a resource and service lead strategically within your organisation. |
## Vision of the Future for Children’s Diabetes Services

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| **One (Basic awareness)** | Be aware that the treatment of diabetes is developing rapidly and signpost others to the Juvenile Diabetes Research Foundation & Diabetes UK (JDRF) & DUK. Develop an understanding that systems (e.g. IT systems) are being developed that are aimed at improving the care of children with diabetes, for example:  
- All MDTs need to function in an integrated and cohesive way with the same targets.  
- All MDTs should have an individual care plan for each child.  
- All MDTs should focus care on achieving HbA1c < 58mmol/mol.  
- All MDTs should be trained to deliver a standardised family focussed model of care using behavioural approaches to communication and changing |
| **Two (Factual knowledge)** | As above and:  
Demonstrate evidence based practice and key decision making to develop strategies to manage young people in crisis i.e. recurrent Diabetes Ketoacidosis and involve key MDT members as appropriate.  
Be able to recognise disorders of growth and sexual development during puberty and make appropriate referrals.  
Demonstrate recognition and awareness of other medical conditions specific to puberty e.g. acne and offer support.  
Be competent to provide expert advice on complex cases including issues related to driving in accordance with the law and current DVLA driving regulations.  
Be competent and able to employ advanced techniques for management of change behaviours as required.  
Identify service shortfalls and work with adult services to provide effective transition in collaboration.  
Work in collaboration with education providers. |
| **Three (Working knowledge)** | As above and:  
Offer an awareness of the different developments that are currently being researched.  
Be aware of what IT systems are available and being developed to effect local practice. |
| **Four (In-depth understanding)** | As above and:  
Maintain knowledge about developments in treatment methods and be able to communicate these to CYP and carers in an effective manner.  
Know about local, national and international networks that are being developed to improve care for CYP with diabetes and inform others.  
Apply in-depth understanding of the impact of team philosophy and approach to managing care and share with others.  
Participate in and apply research findings to clinical practice in partnership with others. |
| **Five (Critical understanding)** | As above and:  
Contribute to the development of local, national and international networks that are aimed at improving the care of CYP with diabetes and their families and develop leadership and partnership dissemination of this approach.  
Be conversant with the techniques that are being researched to change the way diabetes is managed and remain current with developing evidence to inform and develop practice.  
Ensure that relevant databases are established and maintained in order to ensure that appropriate benchmarking can be undertaken.  
Principal or co-lead in research in partnership with key stakeholders. |
Reference List


Contributors

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