Guidelines

for Sick Day Management for People with Diabetes
**When to Follow Sick Day Guidelines**

These guidelines apply when the person with diabetes is feeling unwell or noticing signs of an illness and/or:

**Key Principles of Sick Day Management**

1. **Stress to the person with diabetes the need to continue insulin or diabetes medications**

   **Type 1 diabetes**
   - Ketones are present in blood or urine
   - Blood glucose is > 15.0 mmol/L on two consecutive readings (for example within a 2-6 hour time frame)

   **Type 2 diabetes**
   - Blood glucose is > 15.0 mmol/L on two consecutive readings (for example within an 8-12 hour time frame).

   Gastrointestinal illnesses may cause hypoglycaemia for individuals treated with insulin, sulphonylureas or glitinides. In this instance these medications may need to be reduced according to blood glucose and ketone levels.

2. **Ask the person with diabetes to monitor glucose and ketone levels (if relevant) more frequently**

   **Type 1 diabetes**
   - Blood glucose - two hourly or more frequently if blood glucose < 4.0mmol/L or significant ketones present
   - Ketones - two to four hourly when blood glucose is >15.0 mmol/L and/or signs of illness present.

   For greater accuracy blood ketone testing is preferred, when available.

   **Type 2 diabetes**
   - Blood glucose - two to four hourly, more frequently if blood glucose < 4.0mmol/L.

3. **Ensure person with diabetes has adequate support**

   Ensure person with diabetes has a support person with them and knows when the condition can no longer be managed at home.

   For those in assisted accommodation ensure carers have the knowledge, skills and equipment to provide sick day management.
4. Provide advice on maintaining hydration and carbohydrate intake

Recommend frequent volumes of fluids to prevent dehydration. As a guide, 125 - 250 mls every hour is suggested. Encourage person with diabetes to maintain oral carbohydrate intake to reduce risk of hypoglycaemia and maintain energy requirements.

If unable to consume food the recommendation is:
• Carbohydrate containing fluids if blood glucose < 15.0 mmol/L
• Carbohydrate free fluids if blood glucose > 15.0 mmol/L.

Rehydration solutions (eg Gastrolyte) can help replenish fluid and electrolytes lost through vomiting, diarrhoea or dehydration. Rehydration solutions have a relatively low concentration of carbohydrate therefore additional carbohydrate may be required.

Care should be taken with hypertonic or sweetened fluids if diarrhoea occurs. Sweetened fluids may require dilution up to 1-5 times for optimum absorption.

5. Supervise supplemental insulin or glucose lowering medications to manage hyperglycaemia and ketosis

<table>
<thead>
<tr>
<th>Type 1 diabetes</th>
<th>Type 2 diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Supplemental doses of rapid or fast acting insulin</strong> should be administered.</td>
<td><strong>Treatment</strong></td>
</tr>
<tr>
<td>The dose should be:</td>
<td><strong>Possible action</strong></td>
</tr>
<tr>
<td>• in addition to the usual insulin dose</td>
<td>• May require the addition of sulphonylureas or insulin temporarily</td>
</tr>
<tr>
<td>• given straight away and not delayed until the next regular dose of insulin is due</td>
<td>• If not on maximal dose of sulphonylureas (only applies to <strong>non slow release</strong>) or glitazones consider increasing</td>
</tr>
<tr>
<td>• given as a percentage of the usual total daily dose</td>
<td>• Increasing other glucose lowering agents is not recommended</td>
</tr>
<tr>
<td>• supplemental insulin doses can be given 2-4 hourly, medical care should be sought if no improvement in blood glucose or ketones after 2 supplemental doses.</td>
<td>• May require supplemental quick acting insulin</td>
</tr>
</tbody>
</table>

See Table 1 (pg 6) for supplemental insulin doses and management strategies.

Individuals with insulin pumps can develop ketosis and DKA more quickly because there is no background reservoir of long acting insulin. Always check for technical problems with the pump and advise use of pen or syringe for supplemental insulin dose.

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Close medical supervision is required if blood glucose is >15.0 mmol/L for more than 12 hours (and rapid or short acting insulin is not accessible).

<table>
<thead>
<tr>
<th><strong>Treatment</strong></th>
<th><strong>Possible action</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• No medication for hyperglycemia</td>
<td>• May require supplemental quick acting insulin</td>
</tr>
<tr>
<td>• Treated with glucose lowering agents</td>
<td>• May require supplemental quick acting insulin</td>
</tr>
<tr>
<td>• Treated with glucose lowering agents and nocte protaphane</td>
<td>• May require supplemental quick acting insulin</td>
</tr>
<tr>
<td>• Treated with mixed insulin</td>
<td>• May require supplemental quick acting insulin</td>
</tr>
</tbody>
</table>
6. **Manage the underlying illness**

The intercurrent illness needs to be diagnosed and treated.
Symptoms from the illness need to be differentiated from the symptoms of hyperglycaemia, hypoglycaemia or ketoacidosis.
The use of sugar free medicines is not essential.

7. **Provide advice on prevention of hypoglycaemia**

Illnesses associated with nausea, vomiting or diarrhoea may cause hypoglycaemia.
Follow regular recommendations for treatment of hypoglycaemia.
A reduction in, insulin (by 20-50%) or glucose lowering medications may be required.
Consider "Mini dose" glucagon. Mini dose refers to the use of glucagon to prevent hypoglycemia.
A smaller dose than the standard recommendation for treatment of hypoglycemia is used to maintain glucose levels above 4.0 mmol/L, in people with gastroenteritis or reduced carbohydrate intake.
Care should be taken in individuals who are malnourished e.g. frail older people as glucagon may not be effective.

8. **Discontinue home management of sick days if condition deteriorates or fails to respond to increased insulin**

The following situations are an indication for seeking medical attention in a supervised environment

- **Blood glucose** - does not improve despite 2 supplemental insulin doses or remains > 15.0 mmol/L for those unable to administer supplementary insulin
- **Ketones** - are moderate to heavy (urine) / >1.5 mmol/L (blood) or present and not decreasing with supplemental insulin
- **Signs of DKA or HHS** - such as vomiting, drowsiness, confusion, disorientation, hyperventilation, dehydration or severe abdominal pain
- **Vomiting** - is persistent especially if frequent for more than 2-4 hours or becomes blood or bile stained
- **Severe dehydration**
- **Hypoglycaemia** - is severe or blood glucose cannot be kept above 4.0 mmol/L
- **Too unwell** - if the individual or support people are unable to carry out the monitoring required
- **Unclear diagnosis** - if the diagnosis of the underlying illness is unclear
- **Extremes of age** - children under 2 years or frail older people
- **If unable to carry out above guidelines** e.g. impaired cognitive/physical ability or too sick

**Note:** Earlier help may be advised for women who are pregnant.
Background

This summary version of the Australian Diabetes Educators Association (ADEA) Sick Day Management Guidelines for People with Diabetes has been adapted from the full technical version which provides documentation of the evidence and references used to formulate the guidelines. A consumer version has also been developed.

All versions of the guidelines are available on the ADEA website www.adea.com.au

Guideline Scope

The guidelines apply to the home management of people with diabetes on "sick days". "Sick days" refer to periods of minor intercurrent illness that require changes to the person's usual self management practices.

The guidelines:

• Do not discuss management of diabetic ketoacidosis (DKA), hyperglycaemic hyperosmolar state (HHS) or management of blood glucose in the presence of prolonged intercurrent infection or illness.

• Will require modification for groups such as the Aboriginal and Torres Strait Islander community, pregnant women, children, older people, people with a disability, culturally and linguistically diverse communities and people in remote areas.

• Assume individuals with Type 2 are not prone to ketoacidosis therefore caution should be exercised particularly with people with Type 2 diabetes who are lean, children or pregnant women with Type 2 diabetes or individuals who have previously shown ketones.

Education and preparation is essential for successful sick day management

Education of the person with diabetes, prior to the advent of a sick day, is essential. This should include the key areas of sick day management along with the preparation of a sick day care plan and a home sick day kit.

Sick day education should be provided as part of the education process, after initial diagnosis, and regularly reviewed. Information should be tailored for the individual's situation, history, capacity and capabilities to self manage. Support people should be included in sick day education.

The Sick Day Management Guidelines for Diabetes project was conducted by the Australian Diabetes Educators Association. ADEA gratefully acknowledges the work of the project reference group and the support provided under an unrestricted education grant from Abbott Diabetes Care.

These Guidelines have been endorsed by DiabetesAustralia

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Disclaimer

This document is a general guide to the appropriate practice to follow subject to the clinician's judgement and the person with diabetes preference in each individual case.

The guidelines were designed to provide information to assist decision-making and are based on the best evidence available at the time of development.

ADEA is not responsible for individual decisions or the outcomes of those decisions.
<table>
<thead>
<tr>
<th>Blood Glucose level mmol/L</th>
<th>Ketones Urine/ Blood* mmol/L</th>
<th>Insulin supplement</th>
<th>Review</th>
<th>Fluid Intake</th>
</tr>
</thead>
</table>
| <4.0                      | Negative <1.0               | May require reduction in insulin dose  
Take glucose containing fluids and or quick acting carbohydrate  
Consider mini dose glucagon to prevent hypoglycaemia in people with gastroenteritis or reduced carbohydrate intake. | Hourly until glucose level normalised | Stress need to maintain fluid intake aim for 125-250 mls per hour |
|                           | Positive >1.0               | First priority is to increase blood glucose level with fluid and carbohydrate | Will require supervised medical care if ketones remain present and blood glucose remains low. | Sweetened fluids are recommended if blood glucose is below 15.0 mmol/L |
| ≤15.0                     | Negative/Trace <1.0         | No change to insulin | Two hourly | Unsweetened fluids are recommended if blood glucose is greater than 15.0 mmol/L |
|                           | Small 1.0-1.4               | No change to insulin, re-check blood glucose and ketones in two hours. If persistently elevated, consider an supplemental 5% insulin dose. 
Exercise caution with supplemental insulin doses in the presence of blood glucose < 10.0 mmol/L - advise increasing sweetened fluid intake first | Two hourly | |
|                           | Moderate/large >1.5         | 5-10% supplemental insulin 
Exercise caution with supplemental insulin doses in the presence of blood glucose < 10.0 mmol/L - advise increasing sweetened fluid intake first | Hourly | |
| >15.0-22.0                | Negative/Trace <1.0         | 5% supplemental insulin dose | Hourly | |
|                           | Small 1.0-1.4               | 10% supplemental insulin dose | Hourly | |
|                           | Moderate/large >1.5         | 15-20% supplemental insulin dose | Hourly | |
| >22.0                     | Negative/Trace <1.0         | 10% supplemental insulin dose | Hourly | |
|                           | Small 1.0-1.4               | 15% supplemental insulin dose | Hourly | |
|                           | Moderate/large >1.5         | 20% supplemental insulin dose | If ketones decreasing or remain moderate review in one hour, follow guidelines for further supplemental insulin  
If ketones are increasing or remain large advise to seek supervised medical care | |

Table 1: Supplemental insulin doses for sick days for Type 1 Diabetes - Quick Guide (see full guidelines for detailed version)

Key
% refers to percentage of total daily insulin dosage given as rapid or fast acting insulin  
* refers to results of blood 3β-Hydroxybutyrate

Variations to insulin dose percentages and monitoring apply for Type 2 Diabetes (who have access to short acting insulin) and are outlined below.

Blood Glucose > 15.0 mmol/L advise 10% supplement of total daily insulin dose and 2 hourly monitoring  
Blood Glucose > 22.0 mmol/L advise 20% supplement of total daily insulin dose and 2 hourly monitoring  

Fluid Intake
Stress need to maintain fluid intake aim for 125-250 mls per hour.

*refers to results of blood 3B-Hydroxybutyrate