David is a 23 year old male who has type 1 diabetes mellitus (T1DM). He has had a viral infection over the last two days and developed diabetic ketoacidosis (DKA). The doctor has prescribed 2 litres of fluid (0.9% NaCl) to be given over the next 2 hours.

DKA is a potentially fatal metabolic condition associated with the accumulation of ketone bodies and hyperglycaemic crisis (Gosmanov *et al*, 2014) characterised by hyperglycaemia, and ketosis leading to a state of metabolic acidosis and osmotic diuresis (Braun and Anderson, 2011). DKA typically develops over a period of 2-3 days, triggered by increased demand for insulin. An individual with DKA has a characteristic 'pear drop' smell to the breath produced by excess ketones in blood Notesale.co.uk (Porth. 2015).

Aetiology and risk factors

in criticalle il pati DKA is commonly caused by nfec i nt it can be caused by Greed and Spiers, 2010). mvocardial infart ancreatiti

Noble-Bell and Cox (2014) suggests an annual incidence of 4-8 episodes per 1,000 patients with diabetes; with the worldwide mortality rate as 2-10% (Yehia, 2008).

## Pathogenesis

DKA is caused when the insulin level is inadequate, usually >33.3 mmol/L and high levels of glucose accumulate within the blood as it is unable to be utilised by the cells (Ballestas and Caico, 2014). Porth (2015) states ketoacidosis can occur due to omission or inadequate use of insulin. This lack of insulin results in failure of glucose to enter insulin-sensitive tissues including muscle, liver and adipose tissue (Jerreat, 2010).

When insulin is absent or deficient in T1DM blood glucose remains high following meals at times of illness or stress (Wallymahamed, 2007). Due to this, cells are