Research supports the use of CSII because it has been shown to reduce the risk of severe hypoglycaemia, and improve glycaemic control and quality of life (Pickup et al, 2002; Bode et al, 1996). Box 2 explains the reasons behind these positive outcomes.

It is well documented that repeated episodes of hypoglycaemia can cause individuals to develop hypoglycaemia unawareness (Morrison and Weston, 2008). Using CSII means they can avoid severe hypoglycaemia, which will encourage the return of the signs and symptoms of low blood glucose (Morrison and Weston, 2008).

Background insulin requirements are tailored to accommodate a user’s actual diurnal variation throughout the day, such as the dawn phenomena, which can be factored into the basal rate to prevent a dawn rise in glucose. The set basal rate can also be adjusted on a short-term basis to accommodate any temporary changes that are needed in insulin requirements such as increased physical activity, infection, stress or menstruation (Walsh and Roberts, 2006). Software built into some pumps can guide users on how much insulin to give in these circumstances.

The dawn break rate is matched to users’ requirements, they can skip or delay meals without fear of a drop in their blood-glucose level (Walsh and Roberts, 2006; Bolderman, 2002). This means they can enjoy complete dietary freedom and flexibility if they are using a pump. The mealtime bolus doses are manipulated so they are delivered with the glucose release of various food types (Walsh and Roberts, 2006). This is useful for individuals with malabsorption problems such as gastroparesis (Sharma et al, 2011).

Users who only achieve a minimal improvement in HbA1c following the initiation of CSII often still feel better than when they used MDI; this is because the glycaemic fluctuations on a pump are reduced (Hirsch et al, 2003). An increased sense of well-being leads to an improved quality of life (Chantelau et al, 1997).

Potential problems
Using an automated system does come with potential problems. If the flow of insulin is interrupted for even a short time, the blood–glucose level will start to quickly rise. If the user does not deal with the situation appropriately, the blood–glucose values will continue to rise and ketoacidosis will develop (Bolderman, 2002).

Those who enjoy contact sports or swimming may see attachment to an external device such as a pump as a problem. However, some pumps are waterproof and there are strategies that can allow users to exercise without their pump while maintaining glycaemic control (Walsh and Roberts, 2006).

As the cannula breaks through the natural barrier of the skin, there is risk of infection at the site, particularly as the cannula is usually left in the skin for 2-3 days. In the worst case scenario, if cannulas are not re-sited at appropriate intervals an abscess can develop, which may require surgical drainage (Walsh and Roberts, 2006).

Altered body image can also be an issue for some people who want to use a pump, particularly women who are concerned that it will interrupt the smooth line of their clothes (Walsh and Roberts, 2006). Many people also feel worried about sleeping with a pump or relying on the technology to manage their diabetes (Walsh and Roberts, 2006).

In order to reduce these risks, pump users must take full responsibility for the day-to-day management of their diabetes. The expertise of the professional team providing users with support and education is also a factor that will impact on the success of CSII (NICE, 2008).

Conclusion
The number of insulin pump users in the UK is steadily increasing as people with diabetes become more informed. Since the advent of NICE (2008) criteria, pumps in general are more widely available and diabetes health professionals now have more confidence in the management of CSII.

The benefits of CSII are clear: improved glycaemic control; reduced risk of hypoglycaemia; and improved quality of life and wellbeing. However, although it can be helpful in managing diabetes effectively, it is not a suitable treatment for all and it is certainly not a “cure all” for diabetes. Certain core skills must be learnt by both users and health professionals to enable them to develop the necessary knowledge and problem-solving skills for CSII to be successful. The full benefit of pump therapy will only be achieved with careful user selection, adequate education and ongoing support from a knowledgeable, appropriately resourced insulin pump professional team.