

Continuous Subcutaneous Insulin Infusion

AMERICAN DIABETES ASSOCIATION

Both continuous subcutaneous insulin infusion (CSII) and multiple daily insulin injection therapy are effective means of implementing intensive diabetes management with the goal of achieving near-normal levels of blood glucose and improved lifestyle flexibility.

PROVIDER ASPECTS — As with any drug or medical device, professional staff and people with diabetes must be aware of the nature of insulin-pump therapy and its special requirements and be prepared to manage this therapy. Ideally, CSII therapy should be prescribed, implemented, and followed by a skilled professional team familiar with CSII therapy and capable of supporting the patient.

PATIENT SELECTION — Experience with insulin-pump therapy indicates that candidates for CSII must be strongly motivated to improve glucose control and willing to work with their health care provider in assuming substantial responsibility for their day-to-day care. They must also understand and demonstrate use of the insulin pump, self-monitoring of blood glucose, and use of the data so obtained.

In many people, CSII or multiple insulin injections can provide equivalent improvements in control. Whereas some clinicians recommend CSII only when three or four daily injections fail to provide euglycemia, others consider CSII indicated for motivated patients whose daily schedule makes conventional therapy less effective. An insulin pump may

provide great lifestyle flexibility, particularly with regard to meal schedules and travel but may be too demanding for some individuals. CSII can help improve metabolic control during pregnancy.

The preferred meal planning approach used with patients on CSII is carbohydrate counting or carbohydrate equivalents.

INSULIN PUMPS — Factors to be considered in choosing an insulin pump should include safety features, durability, availability of service by the manufacturer, ability of the supplier to provide training, ease of use, clinically desirable features, and cosmetic attractiveness to the user. The nontechnical person may not be able to adequately evaluate the safety and dependability of the engineering of a new pump, so prescribers are cautioned to recommend or use pumps with field-proven reliability.

Insulin for pumps

Rapid-acting insulin analogs (such as lispro) are appropriate insulins for insulin infusion pumps. The stability of these insulins in pumps has been confirmed. Use of mixtures of insulins in pumps has not been evaluated and therefore is not recommended. Two controlled trials demonstrated improved postprandial glucose control with rapid-acting insulin as compared to short-acting insulin (regular) when delivered immediately before a meal by CSII. Rapid-acting insulin analogs are not approved for use in pregnancy.

SAFETY — Pump therapy is as safe as multiple-injection therapy when recommended procedures are followed. Potential complications peculiar to pump therapy, however, must be explained to users. Undetected interruptions in insulin delivery may result in ketotic episodes more often and more quickly with CSII, which is of particular concern in pregnancy. Infections or inflammation at the needle site may also complicate CSII therapy but can be minimized by careful hygiene and frequent site changes. Hypoglycemia can occur in pump users as with conventional treatments.

SUMMARY — Use of CSII requires care by skilled professionals, careful selection of patients, meticulous patient monitoring, and thorough patient education. Insulin pumps prescribed by a physician within these guidelines are a part of treatment and should be covered by the usual payment mechanisms.

Bibliography

Bode BW, Steed RD, Davidson PC: Reduction in severe hypoglycemia with long-term continuous subcutaneous insulin infusion in type 1 diabetes. *Diabetes Care* 19:324–327, 1996

Farkas-Hirsch R (Ed.): *Intensive Diabetes Management*. 2nd ed. Alexandria, VA, American Diabetes Association, 1998, p. 99–120

Lenhard MJ, Reeves GD: Continuous subcutaneous insulin infusion: a comprehensive review of insulin pump therapy. *Arch Intern Med* 161:2293–2300, 2001

Pickup J, Keen H: Continuous subcutaneous insulin infusion at 25 years: evidence base for the expanding use of insulin pump therapy in type 1 diabetes. *Diabetes Care* 25: 593–598, 2002

Originally approved 1985. Most recent review/revision, 2002.

Abbreviations: CSII, continuous subcutaneous insulin infusion.

© 2004 by the American Diabetes Association.

Downloaded from http://diabetesjournals.org/care/article-pdf/27/suppl_1/s110/459941/zdc1010400s110.pdf by guest on 19 May 2022