

# Continuous Subcutaneous Insulin Infusion

**C**ontinuous subcutaneous insulin infusion (CSII) with an infusion pump is an alternative to conventional injection therapy for achieving normalized levels of blood glucose. Whereas CSII was used primarily in research settings during its early years, pumps have recently extended into general clinical use.

**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 on a 24-h basis. CSII should be provided by a skilled professional team trained in CSII therapy and capable of supporting the patient and providing continuously available care.

**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 patients, CSII or multiple insulin injections can provide equivalent improvements in control. Whereas some clinicians recommend CSII only when 3 or 4 daily injections fail to

provide euglycemia, other clinicians consider the alternative forms of therapy to reflect life-style preference and leave the choice to the patients. An insulin pump may provide great life-style flexibility, particularly with regard to meal schedules and travel but is demanding for some individuals. CSII can help provide excellent metabolic control during pregnancy.

**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 (such as programmable basal rates, if needed), 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. All health professionals should report any problems with pumps or accessories to the manufacturer and should cooperate with the Centers for Disease Control (CDC), the Food and Drug Administration, the manufacturer, and other organizations gathering data regarding this form of therapy.

**SAFETY**—Pump therapy is as safe as multiple injection therapy when recom-

mended procedures are followed. Potential complications peculiar to pump therapy must also be explained. Undetected interruptions in insulin delivery may result in ketotic episodes more often with CSII. Infections or inflammation at the needle site may also complicate CSII therapy but can be minimized by careful hygiene and frequent site changes.

**SUMMARY**—Use of CSII requires continuing available care by skilled professionals, careful selection of patients, meticulous patient monitoring, and provisions for recording and reporting experiences. Insulin pumps prescribed by a physician within these guidelines are a part of treatment and should be covered by usual payment mechanisms.

## References

1. Chanteleau E, Sonnenberg GE, Stanitzek-Schmidt I, Best F, Altenähr H, Berger M: Diet liberalization and metabolic control in type I diabetic outpatients treated by continuous subcutaneous insulin infusion. *Diabetes Care* 5:612-16, 1982
2. Grinvalsky M, Nathan DM: Diets for insulin pump and multiple daily injection therapy. *Diabetes Care* 6:241-44, 1983
3. Rudolf MC, Ahern JA, Genel M, Bates S, Harding P, Hochstadt J, Quinlan D, Tamborlane WV: Optimal insulin delivery in adolescents with diabetes: impact of intensive treatment on psychosocial adjustment. *Diabetes Care* 5 (Suppl. 1): 53-57, 1982
4. Rudolph MCJ, Coustan DR, Sherwin RS, Bates SE, Felig P, Genel M, Tamborlane WV: Efficacy of the insulin pump in the home treatment of pregnant diabetics. *Diabetes* 30:891-95, 1981
5. Teutsch SM, Herman WH, Dwyer DM, Lane JM: Mortality among diabetic patients using continuous subcutaneous insulin infusion pumps. *N Engl J Med* 310: 361-69, 1984
6. Sannar C, Mecklenburg R, Benson E, Benson J Jr, Becker N, Brazel P, Fred-

.....

ORIGINALLY APPROVED JUNE 1985 AND REVISED IN 1993.

REPRINTED FROM *DIABETES CARE* 8:516-17, 1985.

COPYRIGHT 1985 BY THE AMERICAN DIABETES ASSOCIATION.

---

**Position Statement**

lund P, Guinn T, Metz R, Nielsen R: Blockage and leakage of infusion sets causing loss of diabetes control in patients using continuous subcutaneous in-

sulin infusion (Abstract). *Diabetes* 33 (Suppl. 1):74A, 1984  
7. Mecklenburg RS, Benson EA, Benson JW Jr, Fredlund PM, Guinn T, Metz RJ,

Nielsen RL, Sannar CA: Acute complications associated with insulin pump therapy: report of experience with 161 patients. *JAMA* 252:3265-69, 1984