



The Medical **Bulletin**

In Critical Care

1. Personal CGM devices are prescribed by the provider and are owned by the user to be worn every day (preferably) or intermittently. Without the need for finger stick glucose testing or only twice-a-day testing (for calibration), personal CGM provides people with real-time or intermittent interstitial glucose values; trend arrows showing the direction and magnitude of glucose changes; and alarms that alert for hypoglycemia, predicted hypoglycemia, hyperglycemia, and predicted hyperglycemia.
2. The ambulatory glucose profile (AGP) is generated from the CGM download and consists of the glucose management indicator (GMI), an estimate of the equivalent A1c for the preceding 2-week period; the average glucose value; the percentage of time in range (TIR) at various levels; indices of glucose variability; and active CGM wear time.
3. Multiple studies in people with T1D, treated with multiple daily insulin injections or insulin pumps, have demonstrated that the use of CGM reduces A1c, increases glucose time in target range, reduces time in hypoglycemia, improves hypoglycemia awareness in people who have hypoglycemia unawareness, and improves quality of life.
4. Insulin pumps consist of an insulin reservoir, a pumping mechanism, and an infusion set through which insulin is delivered continuously into a subcutaneous site. Rapid-acting insulin analogs are the most common type of insulin used in pumps.
5. Two basic components of insulin delivery by an insulin pump are basal insulin and bolus insulin. Basal insulin is a continuous background insulin infusion to control hepatic glucose production overnight and between meals. Bolus insulin consists of acute insulin doses given to cover meals and/or to correct high BG levels.
6. Bolus insulin has two discrete components: a nutritional dose and a correction dose. The nutritional dose is given to cover the meal a person is preparing to eat. The correction dose is the extra insulin that is added to the nutritional dose if the premeal BG is high; correction boluses may also be taken alone between meals for high-BG values.
7. Hyperglycemia developing suddenly in someone who usually has good BG control on pump therapy requires careful evaluation for potential causes, such as infection; stress; changes in diet, physical activity, or medications; missed doses; insertion-site problems (scar tissue); infusion-set issues (occlusion, kinking); and bad insulin.
8. A hybrid closed-loop system is an integrated system in which CGM data are transmitted directly to an insulin pump, which uses an embedded algorithm to adjust the basal insulin infusion rate and/or give correction boluses to maintain glucose levels within a pre-specified target range. These are called hybrid closed-loop systems because the CGM-responsive algorithms can drive basal rates and correction doses but do not yet have the capability to deliver accurate mealtime boluses.



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9. Do-it-yourself (DIY) artificial pancreas systems (APSs) are not approved by the U.S. Food and Drug Administration. Some people use these systems to achieve their desired glycemic control. The systems are built by the user with various external equipment requirements, including older insulin pumps, which can be out of warranty; the design of each system is individualized by the user, but DIY APSs still require user inputs that rely on a fundamental understanding of diabetes.
10. Hypoglycemia is a common occurrence in diabetes management and is often a barrier to achieving more intensive glycemic targets. Hypoglycemia is classified into three levels. Level 3 is the most severe and requires assistance from another person.

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