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Guidelines for Optimal Bolus Calculator Settings in Adults

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Abstract

Bolus insulin calculators (BCs) became available in insulin pumps in 2002 and are being integrated into glucose meters and portable device applets for use with multiple daily injections. A retrospective analysis of continuous subcutaneous insulin infusion data from the Actual Pump Practices (APP) study is used in this article to generate formulas for more precise BC settings.

A well-designed BC determines accurate bolus doses for carbohydrate intake and for correcting elevated glucose levels. It should also provide the logic necessary to track residual bolus insulin and reduce bolus recommendations to minimize insulin stacking. To provide appropriate bolus doses, a BC requires accurate settings for the carbohydrate factor or insulin:carbohydrate ratio, glucose correction factor, duration of insulin action, and correction target. We provide guidelines to select BC settings from the user's current total daily dose (TDD) of insulin and to determine more appropriate BC settings from an improved TDD based on the mean glucose level.

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Abbreviations: (APP) Actual Pump Practices (BC) bolus calculator, (BOB) bolus insulin on board, (carb) carbohydrate, (CarbF) carbohydrate factor, (CorrF) glucose correction factor, (CT) correction target, (DIA) duration of insulin action, (GIR) glucose infusion rate, (GTR) glucose target range, (IOB) insulin on board, (iTDD) improved total daily dose, (LowGT) lower glucose tertile, (MDI) multiple daily injection, (NPH) neutral protamine Hagedorn, (TDD) total daily dose

Keywords: basal rate, bolus calculator, carb factor, correction factor, insulin dose algorithm, insulin pump, TDD

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