

# Hypoglycemia Treatment in the Hospital: The 15/15 Rule is Over

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## BACKGROUND

Hospitals generally have clear protocols, often nursing driven, for management of inpatient hypoglycemia. The American Diabetes Association recommends a standardized approach to hypoglycemia management in the hospital to address hypoglycemia. A frequent cause of hypoglycemia is poor management of the first hypoglycemia episode. Standard treatment protocols include the use of oral carbohydrate agents for patients who are awake, IV D50 for patients who can't eat and have IV access, or glucagon intramuscular for those patients without IV access. Many protocols are based on the current best practice understanding that 15 grams of carbohydrates raises the glucose by 50 mg/dL within 15 minutes. As a result, most protocols use 15 grams of oral carbohydrates, and use 25 ml of 50% dextrose, which equates to 12.5 grams of carbohydrates, regardless of the severity of hypoglycemia. Most protocols aim for the resolution of hypoglycemia (>80 mg/dL). We evaluated the effect of oral carbohydrate using the 15/15 rule compared with personalized IV D50 doses to address hypoglycemia in the hospital.

## METHODS

Glucomannder™ is an FDA-cleared insulin management software for use in the hospital setting, with modules for IV and subcutaneous insulin. When glucose is <70 mg/dL, Glucomannder provides a precise dosing recommendation for the IV D50 treatment based on the glucose, aiming for a target of 100 mg/dL. For oral carbohydrate treatments, the recommended dose is 15 grams of carbohydrates, regardless of the glucose level. Retrospective data was analyzed from all patients treated with Glucomannder who experienced a reading <70 mg/dL in a 4 ½ year period from January 1, 2017 to June 1, 2021. If another reading >80 mg/dL occurred within 5 minutes, the subsequent result was excluded. If the subsequent reading was done within 45 minutes, the hypoglycemia treatment documented by nursing and the subsequent eligible glucose reading were recorded. The groups were divided by treatment: 15 grams of oral carbohydrates and personalized dose recommendations of IV D50.

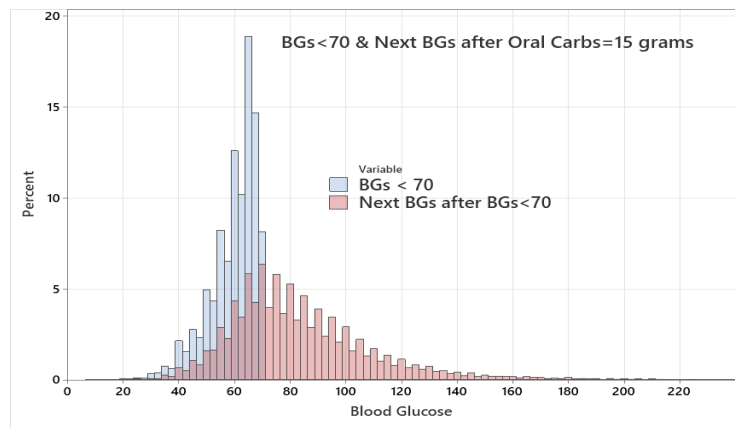
## RESULTS

Of 10,171,422 total Glucomannder blood glucose readings in the date range, 57,629 events <70 mg/dL occurred that met our parameters. The treatment of hypoglycemia in 29,935 events was managed with 15 grams oral carbohydrates and in 27,694 of these events with personalized doses of IV D50. In the oral carbohydrate group, 67.5% subsequent BG readings were >70 mg/dL, with a median next BG of 79 mg/dL. In the IV D50 group, 89.4% subsequent readings were >70 mg/dL, with a median next glucose of 100 mg/dL. In the severe hypoglycemia group (<40 mg/dL): 577 patients were managed with oral carbohydrate, and 34.5% had a subsequent reading >70 mg/dL; 311 patients were managed with IV D50, with 82.1% of subsequent BGs >70 mg/dL.

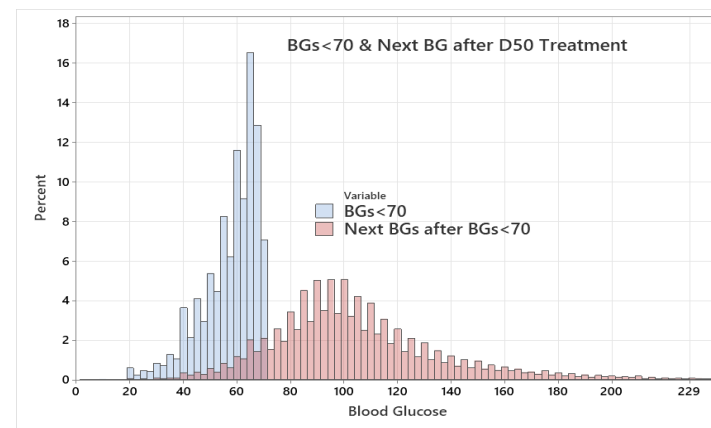
## CONCLUSIONS

IV D50 treatment for hypoglycemia, with a dose related to the degree of hypoglycemia, was highly effective in managing hypoglycemia, with almost 90% achieving blood glucose >70 mg/dL at time of repeat. For more severe hypoglycemia (<40 mg/dL), more than twice as many patients from the personalized IV D50 group achieved blood glucose >70 mg/dL compared to the group that received oral carb treatment using the 15/15 rule. We suggest that IV D50 treatment for hypoglycemia be given based on a precise dosing relative to the degree of hypoglycemia, such as using a computerized dosing algorithm. For patients who consume oral carbohydrates to manage hypoglycemia, 15 grams may be insufficient for some patients with <70 mg/dL and double that amount may be needed for readings <40 mg/dL.

### Oral Carbs Using 15/15 Rule



### Personalized IV D50 Treatment



### % of Subsequent BGs >70mg/dL

