# Emergency Medical Services (EMS) Assist-Requiring Hypoglycemia and Diabetes Mellitus in Southwest Ontario

**Michael Peddle[1,2], Selina Liu[3,4], Heather Reid[3], Melanie Columbus[2], Jeffrey Mahon[3,4], Adam Dukelow[1,2], Tamara Spaic[3,4]**

[1]Southwest Ontario Regional Base Hospital Program, London Health Sciences Centre, London, Canada
[2]Division of Emergency Medicine, Faculty of Medicine, Western University, London, Ontario, Canada
[3]Centre for Diabetes, Endocrinology & Metabolism, St Joseph's Health Care, London Ontario, Canada
[4]Division of Endocrinology & Metabolism, Faculty of Medicine, Western University, London, Ontario, Canada

## Introduction

- Hypoglycemia is a common treatment consequence in diabetes mellitus (DM) and the second most common cause of Emergency Department (ED) visits for adverse drug events.
- Prior studies have examined the rates of ED visits and inpatient hospitalizations for hypoglycemia. These represent only a small proportion of severe hypoglycemic events, as many do not present to hospital.
- To date, there have been no Canadian population-based studies examining the rates of EMS assist-requiring hypoglycemia in DM patients in the pre-hospital setting.

## Objective

- To determine the prevalence and describe the EMS assist-requiring hypoglycemia in DM patients in Southwestern Ontario.

## Methods

- A population-based retrospective cohort study was conducted on all EMS calls for diabetic emergency from 2008-2014 in Southwestern Ontario, Canada.
- Data was extracted from the electronic ambulance call records for 11 EMS services in the region.

## Results

- There were 9,265 EMS calls for a diabetic emergency (demographics are presented in Table 1).
- Parenteral treatment (intravenous dextrose or intramuscular glucagon) was given in 7,126 (77%) calls.
- Between 2008 and 2014, rates of calls increased by 7.4% ($p<0.0001$) with the total number of hypoglycemia calls increasing from 937 (11.2%) in 2008 to 1552 (18.6%) in 2013 (Figure 1)
- Prevalence of hypoglycemia calls during the study period was estimated at 189 per 10,000 diabetes patients per year.
- In 2,297 (24.8%) of instances, the patient refused transport to the ED.

**Table 1**: Patient demographics on presentation

| Demographic | Value |
|---|---|
| Mean age (years) | 59 ± 20 |
| Male, n (%) | 5281 (57) |
| Diabetes, n (%) | 7598 (82) |
| Mean capillary blood glucose (mmol/L) | 2.5 ± 1.0 |
| Initial GCS < 9, n (%) | 2224 (24) |

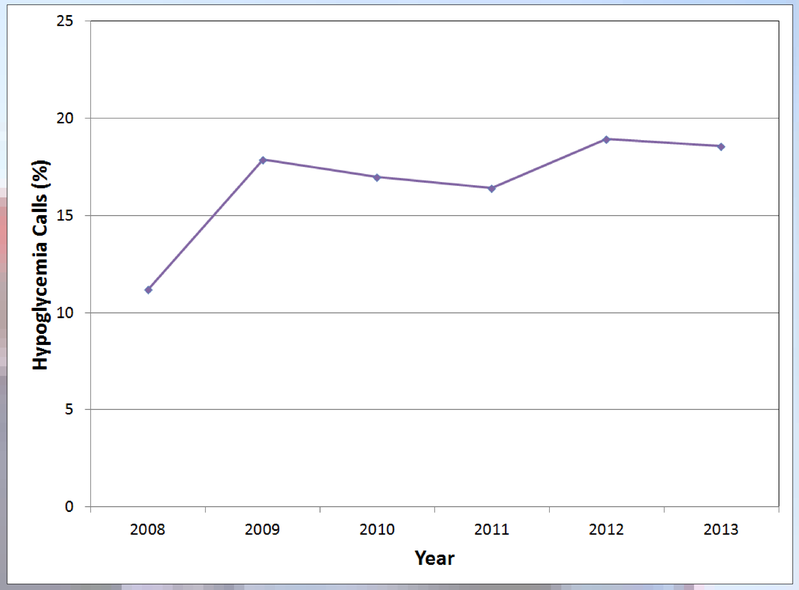


**Figure 1**: Percentage of total EMS calls coded as assist-requiring hypoglycemia from 2008 to 2013.

## Conclusions

- The rates of EMS assist-requiring hypoglycemia are almost double the rates of hospitalization/ED visits for acute DM complications in our region.
- Many life threatening episodes of hypoglycemia may go unreported and subsequently not followed by the patient's primary health care provider.
- Further assessment and proper education following those episodes may help decrease the rate of severe hypoglycemia.