

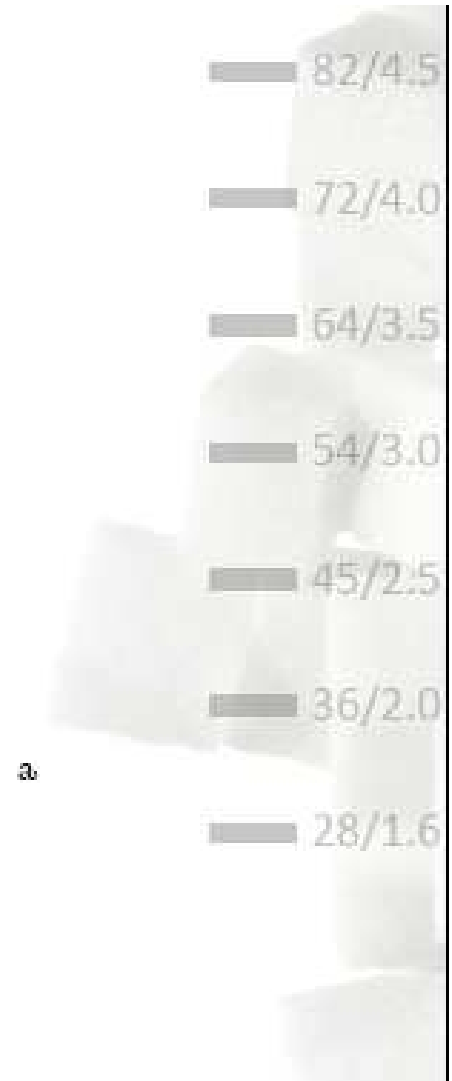
CONVEGNO  
HYPOTHESIS

## Il D.M. nel Dipartimento di Emergenza-Urgenza

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# Introduction

- Hypoglycemia puts patients at risk for unfavorable events and death.
- It is one of the chief and most frequently-observed diabetes-related complaints in emergency departments (ED)
- Because of the high frequency as a cause of altered mental status .... all pts. attending the ED with altered mental status are systematically checked for blood glucose concentration.

# Introduction

- Severe hypoglycemia is an event requiring assistance of another person to actively administer carbohydrates, glucagon, or take other corrective actions.
- Hypoglycemia is also considered severe when plasma glucose measure was unavailable, but neurological recovery following the return of plasma glucose to normal was induced by a low plasma glucose concentration.



## Ipoglicemia: Raccomandazioni

Il glucosio (15 g) per os è il trattamento di scelta per l'ipoglicemia lieve-moderata, sebbene qualsiasi forma di carboidrati contenenti glucosio sia utile, in dosi equivalenti; gli effetti del trattamento dovrebbero essere evidenti entro 15 minuti dall'ingestione. **(Livello della prova VI, Forza della raccomandazione B)**

L'effetto del trattamento sull'ipoglicemia può essere solo temporaneo. Pertanto la glicemia deve essere misurata ogni 15 minuti, fino al riscontro di almeno due valori normali in assenza di ulteriore trattamento tra le due misurazioni. **(Livello VI, Forza B)**

Il glucosio ev. in soluzioni ipertoniche (dal 20 al 33%) è il trattamento di scelta delle ipoglicemie gravi in presenza di accesso venoso. Qualora questo non sia disponibile è indicato l'utilizzo di glucagone per via intramuscolare o sottocutanea. **(Livello VI, Forza B)**

Il glucagone deve essere disponibile a tutti i pazienti con rischio significativo di ipoglicemia grave (diabetici in terapia insulinica e non in buon controllo per l'instabilità delle glicemie o con episodi di ipoglicemia inavvertita). La somministrazione del glucagone non richiede la presenza di un professionista sanitario. **(Livello VI, Forza B)**

## Insulin-induced hypoglycaemia in an accident and emergency department: the tip of an iceberg?

A prospective survey (1976) in a large ED (75.000 attendance) identified 204 (0.3 % pts / year) admissions of adults with severe hypoglycemia, 200 in insulin-treated patients. 96 had a single admission, while 34 were admitted on 104 occasions.

Of the 130 patients, 111 attended diabetic clinics in **Nottingham**, forming 9% of a known clinic population of 1229 individuals on insulin treatment. Since many other episodes of hypoglycaemia were presumably treated outside hospital, 9% a year is a minimum estimate of the incidence of severe hypoglycaemia in our area. The mean insulin dose was 1.2 units/kilogram/day for those admitted twice or more and 0.9 U/kg/day for those admitted once; these doses were significantly higher than those of an age-matched clinic population. An over-treatment had been an important causal factor.

A similarly high incidence has been reported in other studies, and we believe that it is due mainly to the inadequacy of conventional subcutaneous insulin treatment.

Unless conventional insulin treatment can be made safer, .... the problem will be overcome only by wider use of subcutaneous insulin infusion techniques.....

## Hypoglycaemia in an inner-city accident and emergency department: a 12-month survey

Over the 12-month period (1986-87) 72 pts. (0.18%) out of 47,500 attended the ED for hypoglycemia; this included 61 with insulin-dependent diabetes, 3 with non-insulin-dependent diabetes and 8 subjects with no history of diabetes. All subjects (n=8) who had presented with more than one episode of hypoglycaemia had insulin-dependent diabetes. The mean duration of diabetes in the subjects with single or multiple hypoglycaemic episodes was 16.3 and 21.5 years respectively.

In IDDM subjects, 54% had a history of a missed meal, 19% a history of recent alcohol ingestion, 12% an increase in exercise, while 17% had an increase in insulin dosage, as precipitating factors for hypoglycaemia. Of the only 3 (NIDDM) pts, (treated with sulphonylurea), 1 presented after missing a meal, another after having taken an additional glibenclamide tablet and the third after ingestion of alcohol.

... dietary education could potentially ameliorate this situation. ....

Feher MD, Arch Emerg Med 1989

# Appropriateness of leaving emergency medical service treated hypoglycemic patients at home: a retrospective study

The Copenhagen physician-based mobile intensive care unit (MICU), Emergency calls (90 km<sup>2</sup> area, 550.000 inhabitants).

| Mental status                        | Severely depressed | Mod. depressed | Alert      | Total       |
|--------------------------------------|--------------------|----------------|------------|-------------|
|                                      | 404 (35%)          | 621 (54%)      | 123 (11%)  | 1148 (100%) |
| <b>Treatment before MICU arrival</b> |                    |                |            |             |
| Oral glucose                         | 14 (3%)            | 90 (14%)       | 87 (71%)   | 191 (17%)   |
| IM glucagon                          | 4 (1%)             | 11 (2%)        | 1 (1%)     | 16 (1%)     |
| No treatment                         | 386 (96%)          | 520 (84%)      | 35 (28%)   | 941 (82%)   |
| <b>MICU treatment</b>                |                    |                |            |             |
| No recorded treatment                |                    |                | 6 (1%)     | 2 (2%)      |
|                                      | 8 (1%)             |                |            |             |
| Glucagon                             |                    | 10 (3%)        | 13 (2%)    | 23 (2%)     |
| Glucose                              | 393 (97%)          | 568 (92%)      | 40 (33%)   | 1001 (87%)  |
| Oral glucose/food                    | 1 (0%)             | 34 (5%)        | 81 (66%)   | 116 (10%)   |
| Mental status after treatment        |                    |                |            |             |
| Severely depressed                   | 7 (2%)             |                |            | 7 (1%)      |
| Moderately depressed                 |                    | 50 (12%)       | 56 (9%)    | 7 (1%)      |
| Alert                                | 347 (86%)          | 565 (91%)      | 123 (100%) | 1035 (90%)  |

Anderson S. *Acta Anesthesiol. Scand.* 2002

## Appropriateness of leaving emergency medical service treated hypoglycemic patients at home: a retrospective study

**Results:** The MICU treated 1148 hypoglycemic patients within the period, of which 84% were released at home.

Treatment or no treatment before arrival at MICU and the level of consciousness following MICU treatment were found to be strong predictors for the need of transportation to hospital.

Within 72 hours following MICU treatment less than 8% of the patients left at home needed secondary MICU or hospital treatment because of glucose regulatory problems, and less than 5% experienced secondary hypoglycemia.

Less than 1% was admitted to hospital with recurrent hypoglycemia within 24h.

Poor compliance with diabetic treatment instructions often appeared to be involved in cases of recurrent hypoglycemia. A delay in admission was not to the cause of serious secondary events in any cases.

**Conclusion:** The majority of patients with pre-hospital hypoglycemia may safely be treated and released at home in a physician-based EMS area



## Outcome of diabetic patients treated in the prehospital arena after a hypoglycaemic episode, and an exploration of treat and release protocols: a review of the literature

**Objectives:** This review examines current treatment and release protocols adopted by the ambulance service, and factors that may predispose patients to hypoglycaemia.

**Methods:** Online database searches and hand searches of journals led to **241 articles** being found, of which 8 were used for this article.

**Results:** **The out of hospital treatment of hypoglycaemia is safe for most patients,** but further studies are needed if positive improvements are to be made.

**Discussion:** There is a potential for further research in this area and a definition is needed in the treatment and release debate. A definite set of protocols would be beneficial for the ambulance service.

## Frequency of Severe Hypoglycemia Requiring Emergency Treatment in Type 1 and Type 2 Diabetes

A population-based study of health service resource use

**OBJECTIVE**— To determine the incidence, predisposing factors, and costs of ED treatment of severe hypoglycemia in people with type 1 and type 2 diabetes.

**METHODS**— Over a 12-month period (1997-98), dataset of 367,051 people (routine data from the population of Tayside, Scotland, 8,655 pts. with diabetes) with severe hypoglycemia that required emergency assistance including those in primary care, ambulance services, Emergency Departments, and inpatient care.

**RESULTS**—244 episodes recorded in 160 pts: comprising 69 (7.1%) type 1 diabetes, 66 (7.3%) type 2 diabetes treated with insulin, and 23 (0.8%) with type 2 diabetes treated with sulfonylurea tablets. Incidence rates were 11.5 and 11.8 events per 100 pts-years for type 1 and type 2 patients treated with insulin, respectively.

Age, duration, and socioeconomic status were identified as risk factors for severe hypoglycemia. 30% of pts. were treated solely by the ambulance service with no other contact from health care professionals.

## Frequency of Severe Hypoglycemia Requiring Emergency Treatment in Type 1 and Type 2 Diabetes

A population-based study of health service resource use

Table 1—*People in Tayside with diabetes and number of hypoglycemic events*

|                                | Type 1 diabetes | Type 2 diabetes  |
|--------------------------------|-----------------|------------------|
| n                              | 977 (57% male)  | 7,678 (52% male) |
| Mean age (years)               | 33.1            | 65.8             |
| Mean diabetes duration (years) | 17.0            | 8.0              |
| Number of episodes             | 112             | 132              |
| Number of patients             | 69              | 91               |

## Frequency of Severe Hypoglycemia Requiring Emergency Treatment in Type 1 and Type 2 Diabetes

A population-based study of health service resource use

Table 2—Incidence of severe hypoglycemia requiring NHS resource use

| Type of diabetes | Treatment modality    | Incidence       |
|------------------|-----------------------|-----------------|
| Type 1           | Insulin               | 11.5 (9.4–13.6) |
| Type 2           | Insulin               | 11.8 (9.5–14.1) |
| Type 2           | Sulphonylurea tablets | 0.9 (0.6–1.3)   |
| Type 2           | Metformin or diet     | 0.05 (0.01–0.2) |

Data are events expressed per 100 patient-years (95% CI).

**CONCLUSIONS** Severe hypoglycemia is as **common in pts. with type 2 diabetes treated with insulin as in pts. with type 1 diabetes**. It is associated with considerable NHS resource use that has a significant economic and personal cost.

Leese GP, **Diabetes Care** 2003

## Emergency Department Visits for Outpatient Adverse Drug Events: Demonstration for a National Surveillance System

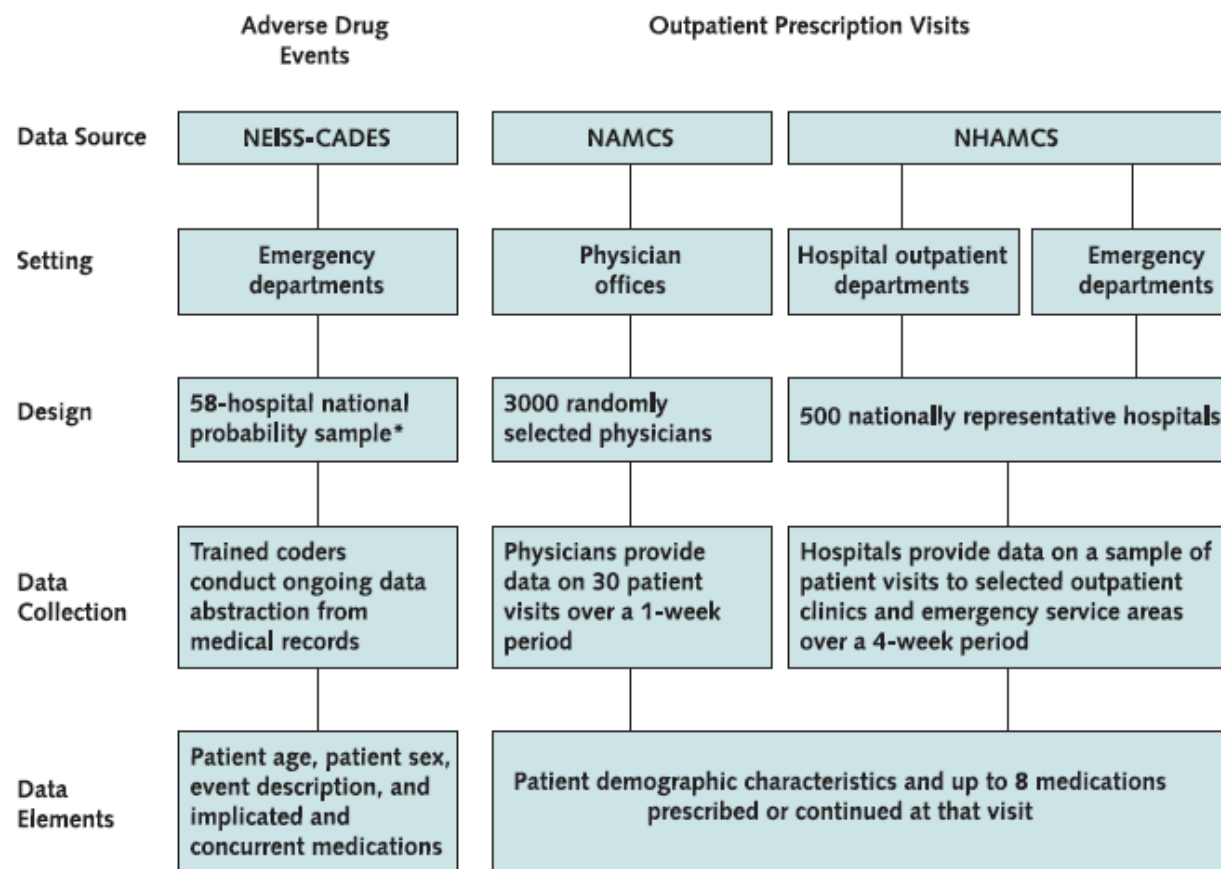
| Drug Category                        | Overall   |             | Hospitalizations |             |               |
|--------------------------------------|-----------|-------------|------------------|-------------|---------------|
|                                      | No.       | %           | No.              | %           | Rate /100 Pts |
| Antimicrobial agents                 | 96        | 16.1        | 0                | 0.0         | 0.0           |
| <b>Diabetic agents</b>               | <b>78</b> | <b>13.0</b> | <b>9</b>         | <b>17.3</b> | <b>11.5</b>   |
| Cardiovascular agents                | 51        | 8.5         | 12               | 23.1        | 23.5          |
| Nonopioid analgesics                 | 49        | 8.2         | 1                | 1.9         | 2.0           |
| Psychiatric agents                   | 42        | 7.0         | 4                | 7.7         | 9.5           |
| Opioid-containing analgesics         | 39        | 6.5         | 2                | 3.8         | 5.1           |
| Anticoagulants                       | 28        | 4.7         | 8                | 15.4        | 28.6          |
| Cold preparations and antihistamines | 27        | 4.5         | 0                | 0.0         | 0.0           |
| Anticonvulsants                      | 18        | 3.0         | 3                | 5.8         | 16.7          |
| Gastrointestinal agents              | 17        | 2.8         | 2                | 3.8         | 11.8          |
| Corticosteroids                      | 9         | 1.5         | 0                | 0.0         | 0.0           |
| Antineoplastic agents                | 7         | 1.2         | 2                | 3.8         | 28.6          |
| Respiratory agents                   | 6         | 1.0         | 0                | 0.0         | 0.0           |
| Other agents                         | 32        | 5.4         | 1                | 1.9         | 3.1           |
| Drugs from OI category               | 43        | 7.2         | 4                | 7.7         | 9.3           |
| Unknown drugs                        | 8         | 1.3         | 2                | 3.8         | 25.0          |

**Aim:** look at diabetic emergencies seen in A&E dept. to ascertain:

- Frequency of hypoglycaemia compared with other diabetic emergencies.
- Management of hypoglycaemia by the ambulance service and in A&E
- Number of patients requiring admission
- Follow up arrangements for patients discharged from A&E.

**RESULTS:** 1779 emergency calls to the SAS in the 12 month period (Oct 00 Sep 01) coded for diabetes. 883 (50%) calls resulted in a transfer to hospital; Only 27% of these were transferred to hospital. Mean age of the patients was 54 years. Age did not influence the likelihood of transfer to hospital. Hypo- was the commonest diabetic emergency encountered by SAS and A&E departments. The management of hypoglycaemia by the A&E was varied and not always appropriate. The vast majority of people who attend A&E with hypoglycaemia were discharged and the majority had no follow up arrangements made.

# Medication Use Leading to Emergency Department Visits for Adverse Drug Events in Older Adults

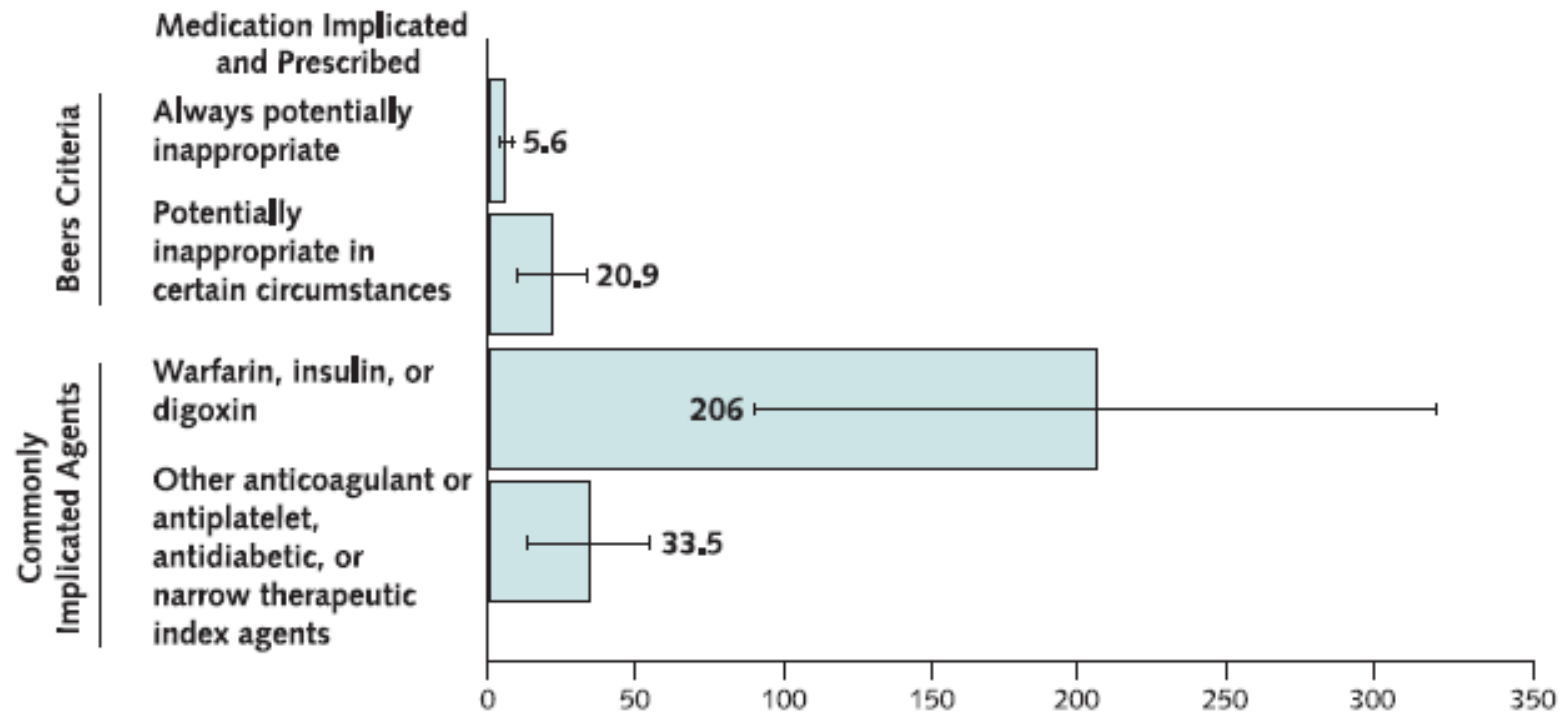


NAMCS National Ambulatory Medical Care Surv.; NEISS-CADES: National Electronic Injury Surveillance System–Cooperative Adverse. Drug Event Surveillance System; NHAMCS National Hospital Ambulatory Medical Care Survey.

\*The NEISS-CADES is a 63-hospital national probability sample

# Medication Use Leading to Emergency Department Visits for Adverse Drug Events in Older Adults

Annual Estimated ED Visits for ADEs per 100 000 Outpatient Prescription Visits





## Trends and Disparities in U.S. Emergency Department Visits for Hypoglycemia, 1993-2005

Epidemiologic data from National Hospital Ambulatory Medical Care Survey

|                    | N. of cases | Estimated N. cases (95% CI) | Rate per 1,000 of the diabetic Pts. (95% CI) | Rate per 1,000 ED visits (95% CI) |
|--------------------|-------------|-----------------------------|--|-----------------------------------|
| <b>Years</b>       |             |                             |  |                                   |
| 1993-1995          | 215         | 773 (578-969)               | 30 (23-38)                                   | 2.8 (2.1-3.5)                     |
| 1996-1997          | 152         | 672 (524-820)               | 43 (32-54)                                   | 3.6 (2.8-4.4)                     |
| 1998-1999          | 141         | 740 (543-937)               | 26 (19-33)                                   | 3.6 (2.7-4.6)                     |
| 2000-2001          | 222         | 897 (663-1,130)             | 40 (30-50)                                   | 4.2 (3.1-5.2)                     |
| 2002-2003          | 262         | 776 (633-920)               | 32 (24-39)                                   | 3.5 (2.8-4.1)                     |
| 2004-2005          | 311         | 1,100 (864-1,340)           | 33 (26-39)                                   | 4.9 (3.8-5.9)                     |
| <b>Age (years)</b> |             |                             |  |                                   |
| ≤45                | 401         | 1,550 (1,330-1,780)         | 62 (53-71)                                   | 1.7 (1.5-2.0)                     |
| 0-19               | 78          | 359 (229-489)               | —  | 0.9 (0.6-1.2)                     |
| 20-44              | 323         | 1,200 (1,020-1,370)         | —  | 2.3 (2.0-2.7)                     |
| 45-64              | 364         | 1,230 (1,060-1,400)         | 19 (17-22)                                   | 5.5 (4.7-6.2)                     |
| 65-74              | 219         | 845 (698-991)               | 25 (20-29)                                   | 10 (8.5-12)                       |
| ≥75                | 319         | 1,330 (1,090-1,580)         | 54 (44-64)                                   | 12 (9.4-14)                       |

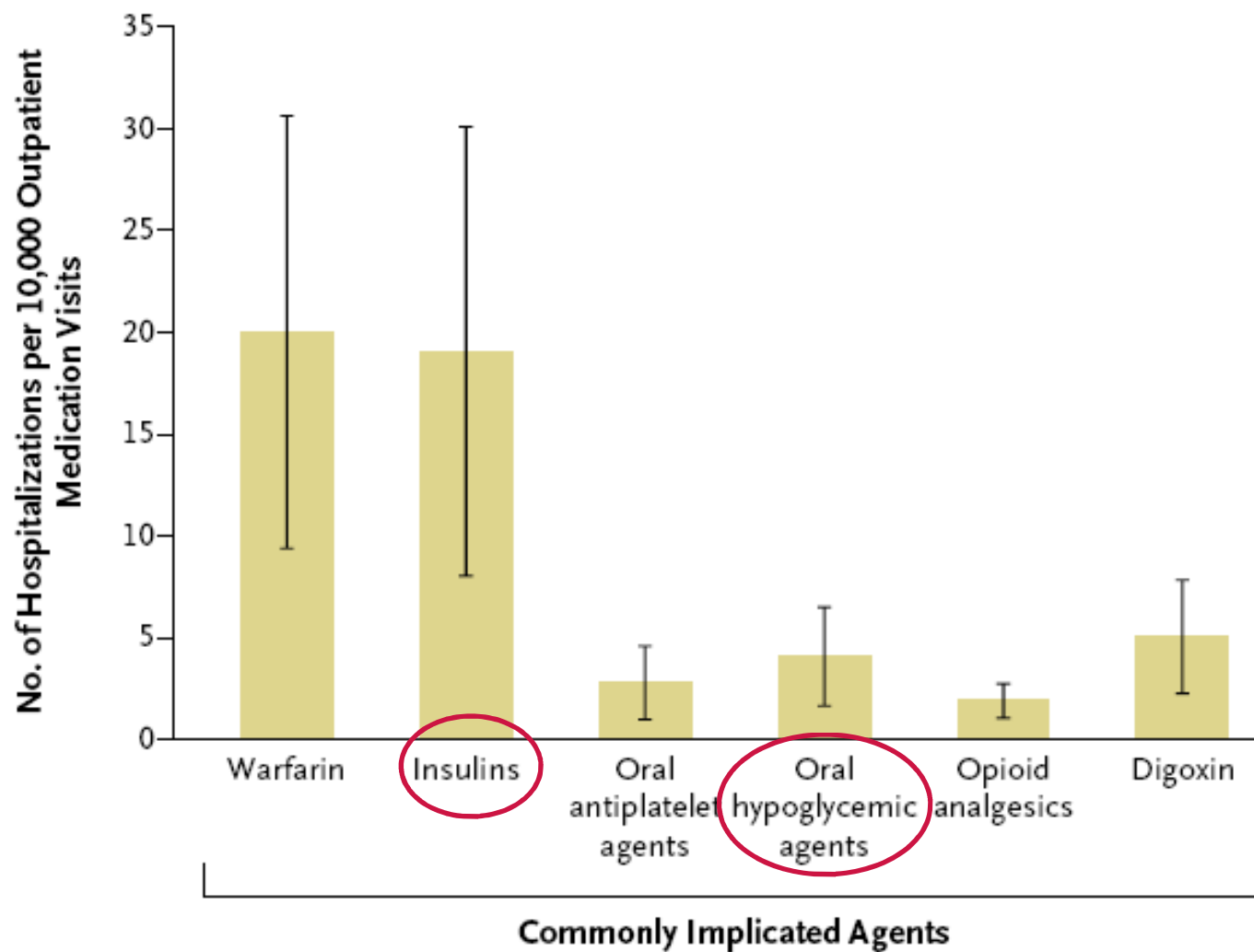
## Trends and Disparities in U.S. Emergency Department Visits for Hypoglycemia, 1993-2005

|                  | N. of cases | Estimated N. cases (95% CI) | Rate per 1,000 of the diabetic Pts. (95% CI) | Rate per 1,000 ED visits (95% CI) |
|------------------|-------------|-----------------------------|--|-----------------------------------|
| <b>Race</b>      |             |                             |  |                                   |
| White            | 829         | 3,270 (2,910–3,640)         | 28 (25–31)                                   | 3.6 (3.2–4.0)                     |
| Black            | 326         | 1,210 (970–1,450)           | 50 (40–60)                                   | <b>4.8 (3.9–5.8)</b>              |
| Other            | 36          | 104 (50–159)                | 14 (6.5–21)                                  | 3.4 (1.6–5.1)                     |
| <b>Ethnicity</b> |             |                             |  |                                   |
| Hispanic         | 100         | 329 (241–416)               | 21 (15–27)*                                  | 2.5 (1.8–3.2)                     |
| Non-Hispanic     | 985         | 3,720 (3,290–4,150)         | 12 (10–13)*                                  | <b>3.9 (3.5–4.4)</b>              |
| <b>Insurance</b> |             |                             |  |                                   |
| Private          | 285         | 1,140 (963–1,300)           | NA   | 2.6 (2.2–3.0)                     |
| Public           | 643         | 2,430 (2,090–2,760)         | NA   | <b>5.8 (5.0–6.6)</b>              |
| Self-pay         | 111         | 414 (316–513)               | NA   | 2.2 (1.7–2.7)                     |
| Other/unknown    | 124         | 416 (316–515)               | NA   | 2.4 (1.8–3.0)                     |

## Emergency Hospitalizations for Adverse Drug Events in Older Americans

|   | Annual National Hospitalizations (N = 99,628) |                        | Proportion of ED Visits Resulting in Hospitalization |
|---|---|------------------------|--|
|   | No  | % (95%CI)              | %  |
| <b>Most commonly implicated medications</b> |   |                        |  |
| Warfarin                                    | 33,171  | 33.3 (28.0–38.5)       | 46.2   |
| <b>Insulins</b>                             | <b>3,854</b>                                  | <b>13.9 (9.8–18.0)</b> | <b>40.6</b>  |
| Oral antiplatelet agents                    | 13,263‡                                       | 13.3 (7.5–19.1)        | 41.5   |
| <b>Oral hypoglycemic agents</b>             | <b>10,656</b>                                 | <b>10.7 (8.1–13.3)</b> | <b>51.8</b>  |
| Opioid analgesics                           | 4,778   | 4.8 (3.5–6.1)          | 32.4   |
| Antibiotics                                 | 4,205   | 4.2 (2.9–5.5)          | 18.3   |
| Digoxin                                     | 3,465   | 3.5 (1.9–5.0)          | 80.5   |
| Antineoplastic agents                       | 3,329‡  | 3.3 (0.9–5.8)‡         | 51.5   |
| Antiadrenergic agents                       | 2,899   | 2.9 (2.1–3.7)          | 35.7   |
| Renin–angiotensin inhibitors                | 2,870   | 2.9 (1.7–4.1)          | 32.6   |
| Sedative or hypnotic agents                 | 2,469   | 2.5 (1.6–3.3)          | 35.2   |
| Anticonvulsants                             | 1,653   | 1.7 (0.9–2.4)          | 40.0   |
| Diuretics                                   | 1,071‡  | 1.1 (0.4–1.8)‡         | 42.4   |

## Emergency Hospitalizations for Adverse Drug Events in Older Americans

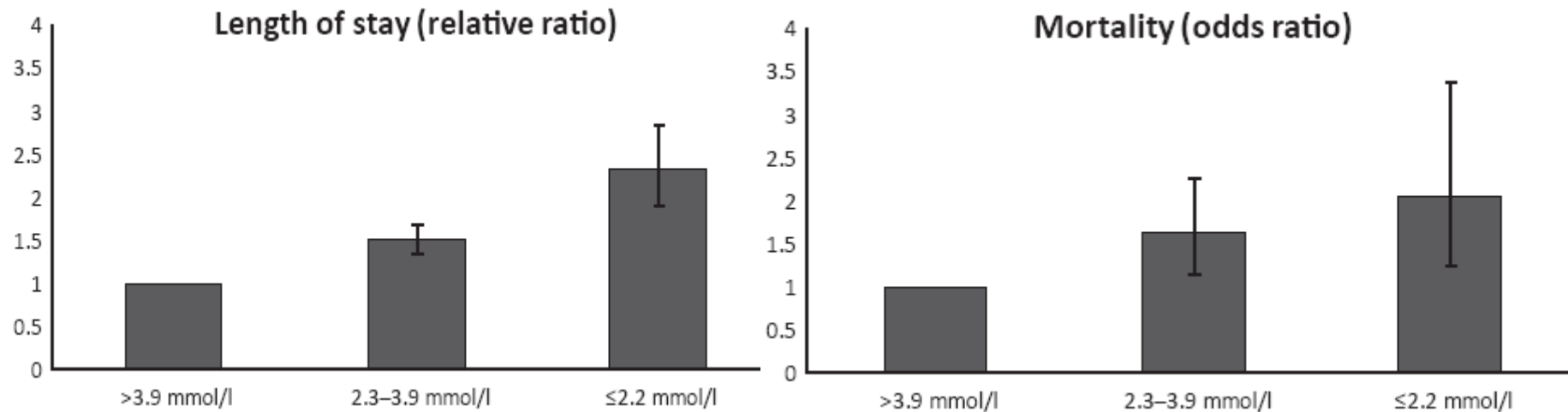


## Emergency Hospitalizations for Adverse Drug Events in Older Americans

**Table 3.** National Estimates of Emergency Hospitalizations for Common Manifestations of Adverse Drug Events in Older U.S. Adults, 2007–2009.\*

| Therapeutic Category and Adverse-Event Manifestation†                | Annual National Estimate of Hospitalizations<br>% (95% CI) | Proportion of Emergency Department Visits Resulting in Hospitalization<br>% |
|--|--|---|
| <b>Endocrine agents</b>  |  |   |
| Hypoglycemia with loss of consciousness or seizure                   | 26.0 (13.5–38.4)   | 57.5  |
| Hypoglycemia with altered mental status or other neurologic sequelae | 40.7 (31.8–49.5)   | 42.4  |
| Hypoglycemia with cardiovascular sequelae                            | 8.3 (6.1–10.4)   | 49.6  |
| Hypoglycemia with weakness, dyspnea, or respiratory distress         | 5.7 (3.0–8.5)  | 47.5  |
| Hypoglycemia with other or unspecified sequelae                      | 14.0 (6.2–21.8)  | 37.3  |

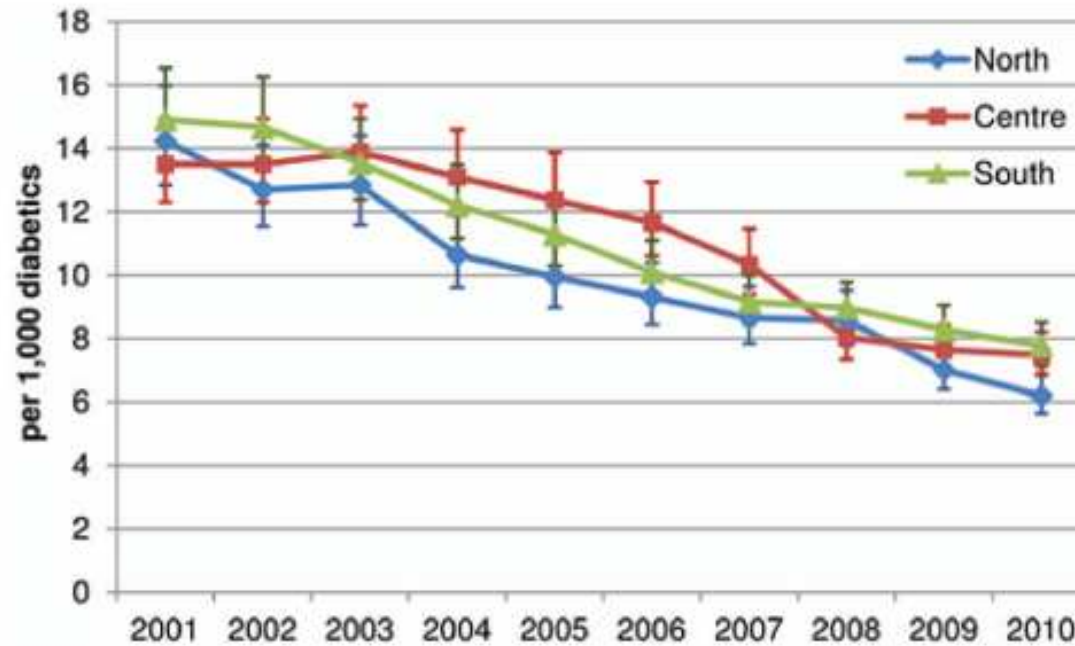
## Hypoglycaemia is associated with increased length of stay and mortality in people with diabetes who are hospitalized



Severity of hypoglycaemia vs. inpatient mortality and length of stay (adjusted odds ratio for mortality and adjusted relative ratio for length of stay). Relative ratio here is the exponential of regression coefficient obtained from the analysis of log transformed length-of-stay data.

Covariates adjusted for are age, gender, ethnicity, social class, admission type, insulin use and Charlson comorbidity score. Bars indicate the confidence intervals.

## Temporal Trend in Hospitalizations for Acute Diabetic Complications: A Nationwide Study, Italy, 2001–2010



**Figure 1. Temporal trend in hospitalization rates/1,000 diabetic people for acute diabetic complications, by North, Center and South of Italy, 2001–2010.** Vertical bars indicate 95% CIs.  
doi:10.1371/journal.pone.0063675.g001

## Temporal Trend in Hospitalizations for Acute Diabetic Complications: A Nationwide Study, Italy, 2001–2010

| Discharges                | Acute Diabetic Complications | Acute Hyperglycemic Complications | Hypoglycemic Coma |
|---------------------------|------------------------------|-----------------------------------|-------------------|
| N. of cases               | 266,374                      | 251,528                           | 14,846            |
| Complications             | 110,033 (41.3%)              | 98,133 (39.0%)                    | 11,900 (80.2%)    |
| Duration of stay in days  | 9.2 (11.1)                   | 9.3 (11.3)                        | 6.9 (6.8)         |
| Age distribution (years)  |                              |                                   |                   |
| 0–19                      | 8.3%                         | 8.7%                              | 1.1%              |
| 20–44                     | 9.0%                         | 9.2%                              | 6.0%              |
| 45–64                     | 20.6%                        | 21.0%                             | 14.0%             |
| ≥65                       | 62.1%                        | 61.1%                             | 78.9%             |
| Patients                  |                              |                                   |                   |
| N                         | 214,899                      | 203,273                           | 13,764            |
| Female, n (%)             | 111,917 (52.1%)              | 105,321 (51.8%)                   | 7724 (56.1%)      |
| Age*, mean (SD)           | 65.8 (20.4)                  | 65.3 (20.6)                       | 72.8 (15.4)       |
| Re-hospitalizations       | 26,552 (12.4%)               | 24,629 (12.1%)                    | 543 (3.9%)        |
| In-hospital deaths, n (%) | 16,402 (7.6%)                | 16,117 (7.9%)                     | 285 (2.1%)        |

- Lombardo F, **PLOS ONE** 8 (5): e63675. doi:10.1371/journal.pone.0063675



## Temporal Trend in Hospitalizations for Acute Diabetic Complications: A Nationwide Study, Italy, 2001–2010

Hospital admission rates for acute diabetic complications in Italy, 2001–2010.

|             | Acute Diabetic Complications |                         |                       | Hypoglycemic coma |                         |                         |
|-------------|------------------------------|-------------------------|-----------------------|-------------------|-------------------------|-------------------------|
|             | N                            | Rate /100,000 Residents | Rate / 1000 Diabetics | N                 | Rate /100,000 Residents | Rate / 1000 Diabetics   |
| <b>2001</b> | 32,096                       | 56.3                    | 14.4 (13.8–15.1)      | 1,794             | 3.1                     | <b>0.81 (0.84–0.77)</b> |
| <b>2002</b> | 30,304                       | 53.1                    | 13.7 (13.1–14.3)      | 1,758             | 3.1                     | 0.80 (0.76–0.83)        |
| <b>2003</b> | 30,072                       | 51.7                    | 13.5 (12.9–14.1)      | 1,615             | 2.8                     | 0.72 (0.69–0.76)        |
| <b>2004</b> | 27,694                       | 46.9                    | 11.9 (11.3–12.4)      | 1,492             | 2.5                     | 0.64 (0.61–0.67)        |
| <b>2005</b> | 26,861                       | 44.7                    | 11.0 (10.5–11.6)      | 1,466             | 2.4                     | 0.60 (0.57–0.63)        |
| <b>2006</b> | 26,512                       | 43.5                    | 10.2 (9.7–10.7)       | 1,445             | 2.3                     | 0.56 (0.53–0.58)        |
| <b>2007</b> | 25,177                       | 40.7                    | 9.3 (8.9–9.7)         | 1,463             | 2.3                     | 0.54 (0.52–0.56)        |
| <b>2008</b> | 24,732                       | 39.3                    | 8.6 (8.3–9.0)         | 1,371             | 2.1                     | 0.48 (0.46–0.50)        |
| <b>2009</b> | 22,052                       | 34.5                    | 7.7 (7.3–8.0)         | 1,275             | 1.9                     | 0.44 (0.42–0.46)        |
| <b>2010</b> | 20,874                       | 32.4                    | 7.1 (6.8–7.4)         | 1,167             | 1.7                     | <b>0.39 (0.38–0.41)</b> |

## Conclusions:

- Potter, *BMJ* **1982**: 3.0 /1000 ED visits per year
- Feher, *Arch Emerg Med* **1989**: 1.8 /1000 ED visits per year
- Anderson, *Acta Anesthesiol. Scand.* 2002.: 5.0% incidence of all Emergency call
- Leese, *Diab. Care* **2003**; 1.15 and 1.18 /1000 visits per years for type 1 and type 2 (primary care, ambulance services, hospital ED, inpatient care)
- Brackenridge, *EMJ* **2006**: 1.3% incidence of all SAS Emergency call per year.
- Brudnitz, *Ann Intern Med* **2007**: 11.5% event rate per 100 pts. hospitalized
- Ginde, *Diab. Care* **2008**: 2.8 - 4.9 /1000 ED visits per year
- Brudnitz, *NEJM* **2011**: 18 (insulin) and 4 (oral antidiabetics) hospitalization 10.000 out-patients medication visits per year.
- Farmer, *Diabet Med* **2012**: 1.02% / all Emergency call per year.
- Lombardo, *PLOS ONE* **2013**: 0.4% – 0.8% / 1000 discharged pts. 1.7 – 3.1 events / 100.000 residents.
- ..... HYPOTHESIS ?? .....