

# A Mishmash of Inpatient Diabetes Care

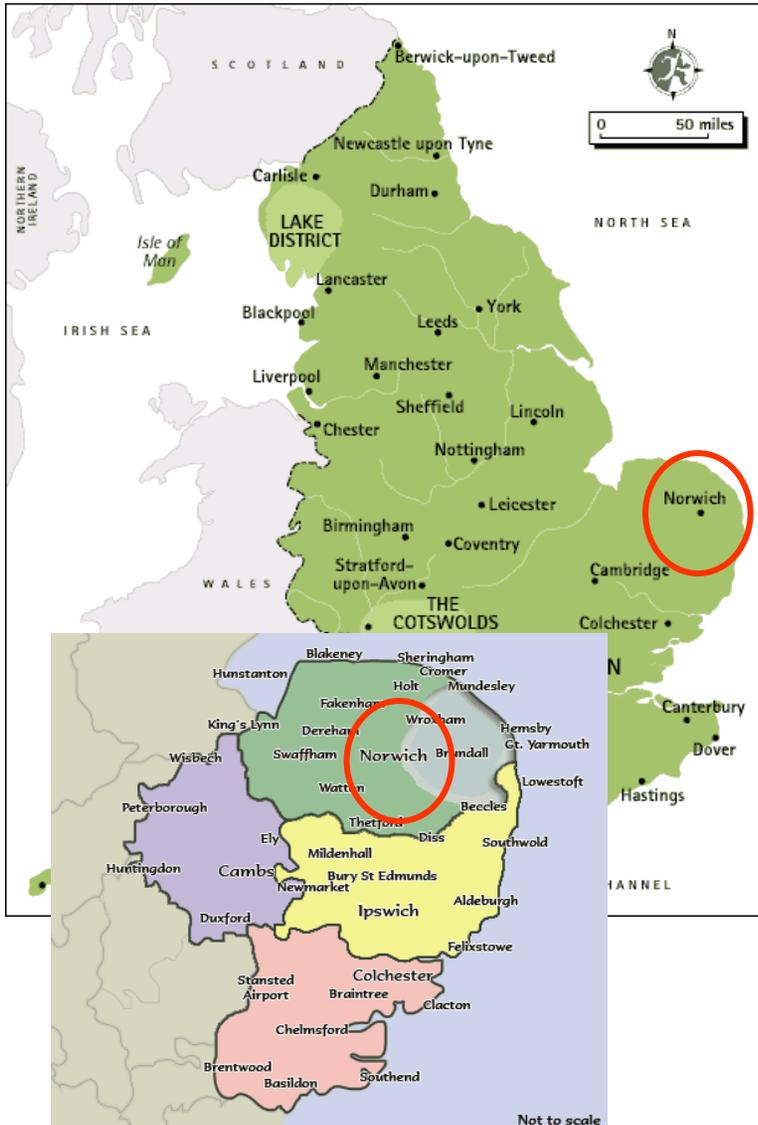
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# Topics to Cover

- Peri-operative care
  - Surgical patients – US data
- Effects of hyperglycaemia on the AMU
  - Medical patients – NNUH data
- Guidelines

# Where is Norwich?



- NNUH is a 989 bedded hospital that serves a population of 600,000 over an area of about 2000 square miles

# Who is This Strange Man?

- I qualified in 1991
- I trained in D&E and GIM in South Thames
- I did general practice for 2 years
- I did ITU / anaesthetics for a year
- I did research at Mayo Clinic (DHEA anyone?)
- I have been in Norwich since 2004
- Currently my national roles are
  - ABCD meetings secretary
  - Member of SCE QWG, EB and SSC
  - JBDS – IP Group member (inpatient diabetes guidelines)
    - Peri-operative, DKA, Hypo, HHS, enteral feeding, self management, e-learning on safe use of IV insulin, etc, etc, etc

# Peri-operative Care

## Excess Mean Length of Stay in Diabetes Inpatients Aged 18 – 60 Years

### 269,265 Diabetes Discharges and 4,411,593 Matched Controls

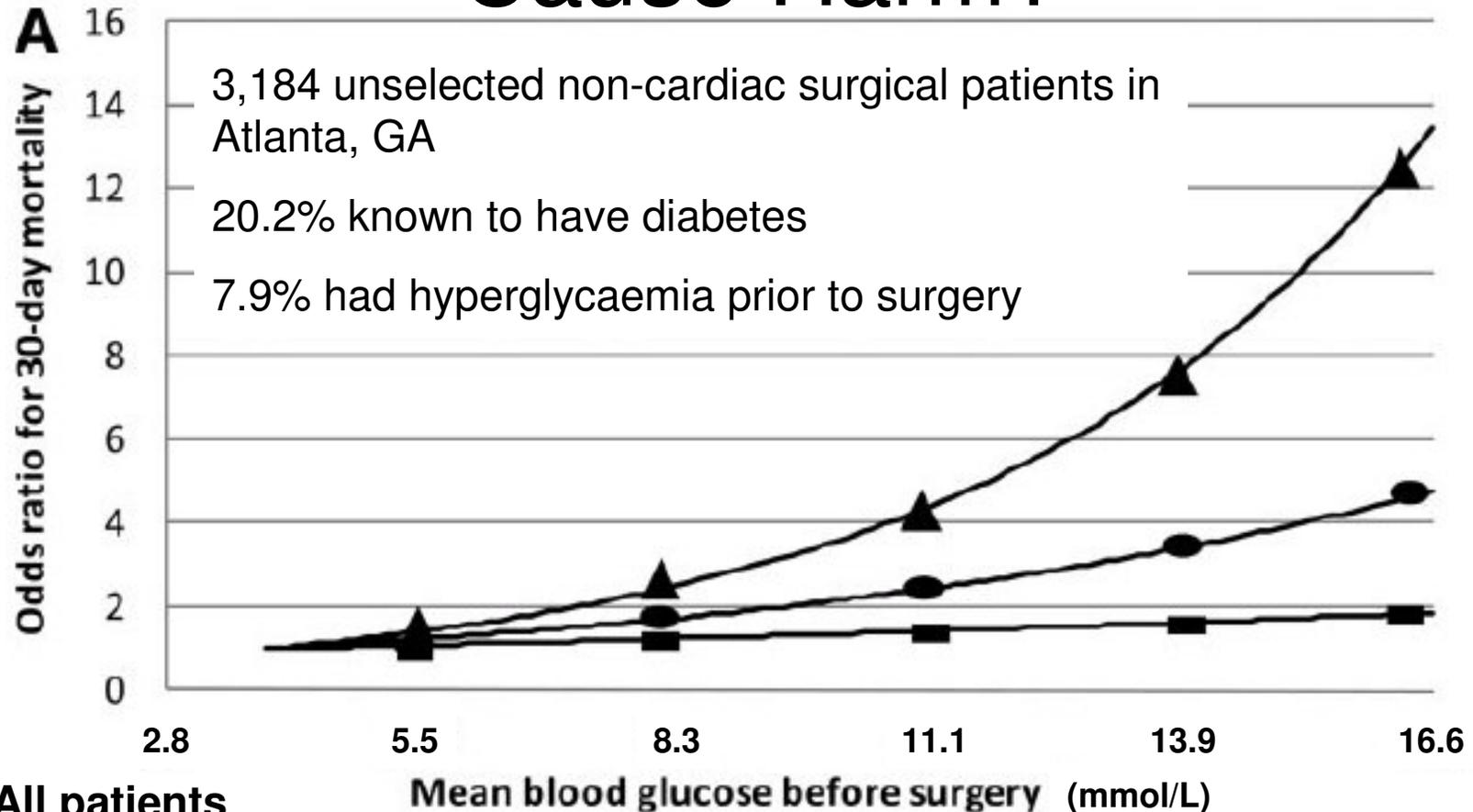
	Mean LOS (days)			Excess LOS (days)			n		
	E10	E11	C	E10	E11	E10	E11	C	
<b>Surg.</b>	5.4 (0.1)	5.1 (0.1)	4.2 (0.2)	1.2	0.9	18,032	32,135	1,501,453	
<b>T &amp; O</b>	4.8 (0.1)	5.3 (0.2)	4.6 (0.1)	0.2	0.7	8,178	12,203	885,606	
<b>GM</b>	4.8 (0.2)	5.4 (0.2)	4.4 (0.1)	0.4	1.0	70,988	82,446	1,709,553	
<b>Card.</b>	4.2 (0.1)	4.2 (0.1)	3.8 (0.1)	0.4	0.4	5,307	15,009	229,784	
<b>MFE</b>	4.8 (0.2)	5.6 (0.2)	4.7 (0.1)	0.1	0.1	2,444	4,549	85,197	

E10 = Type 1 diabetes      E11 = Type 2 diabetes      c = controls

English Hospitals, 4 consecutive years of discharges 2000-2004

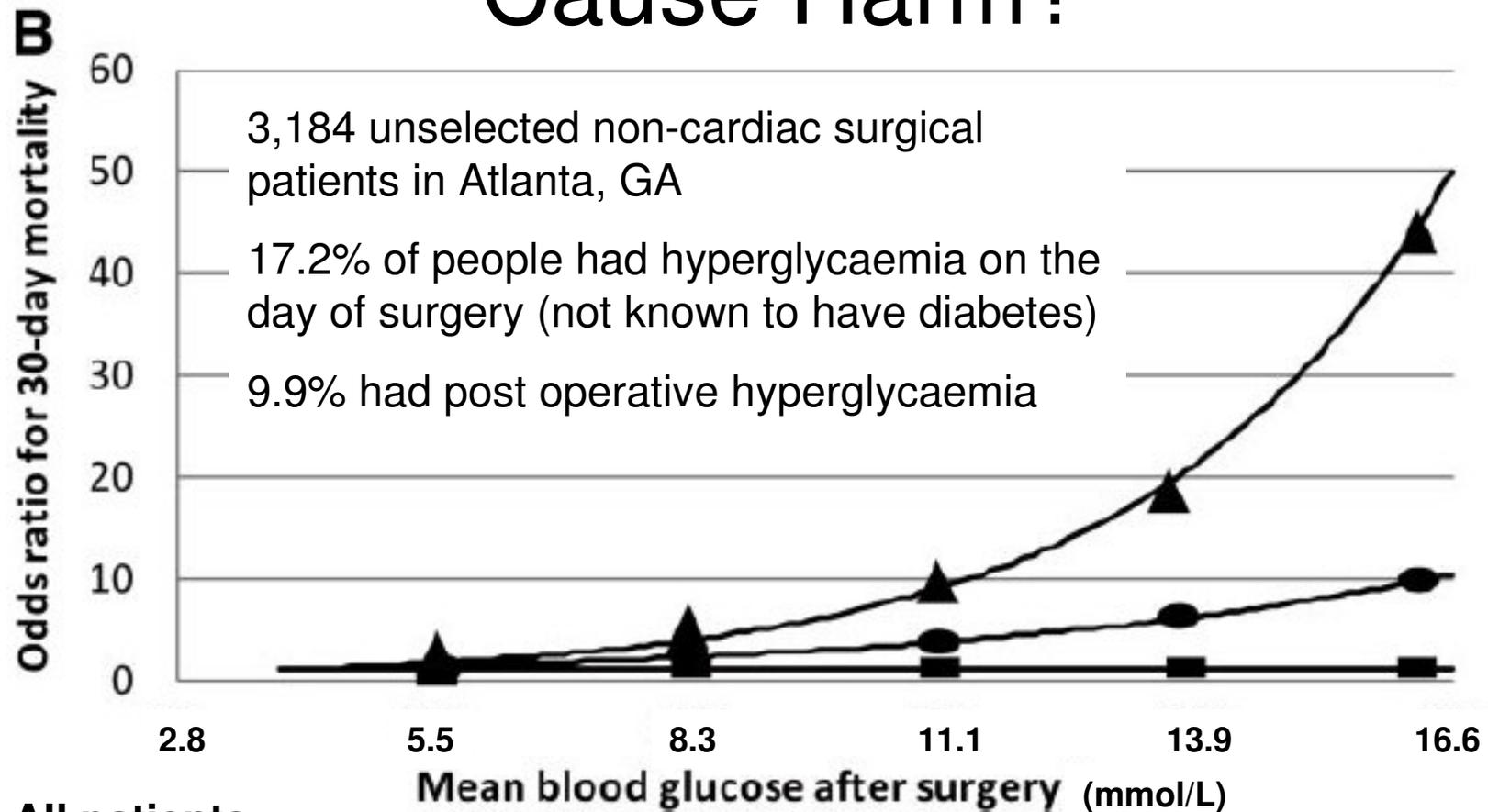
Sampson MJ et al Diabetes Research & Clinical Practice 2007;77(1):92-98

# Do High Admission Glucose Levels Cause Harm?



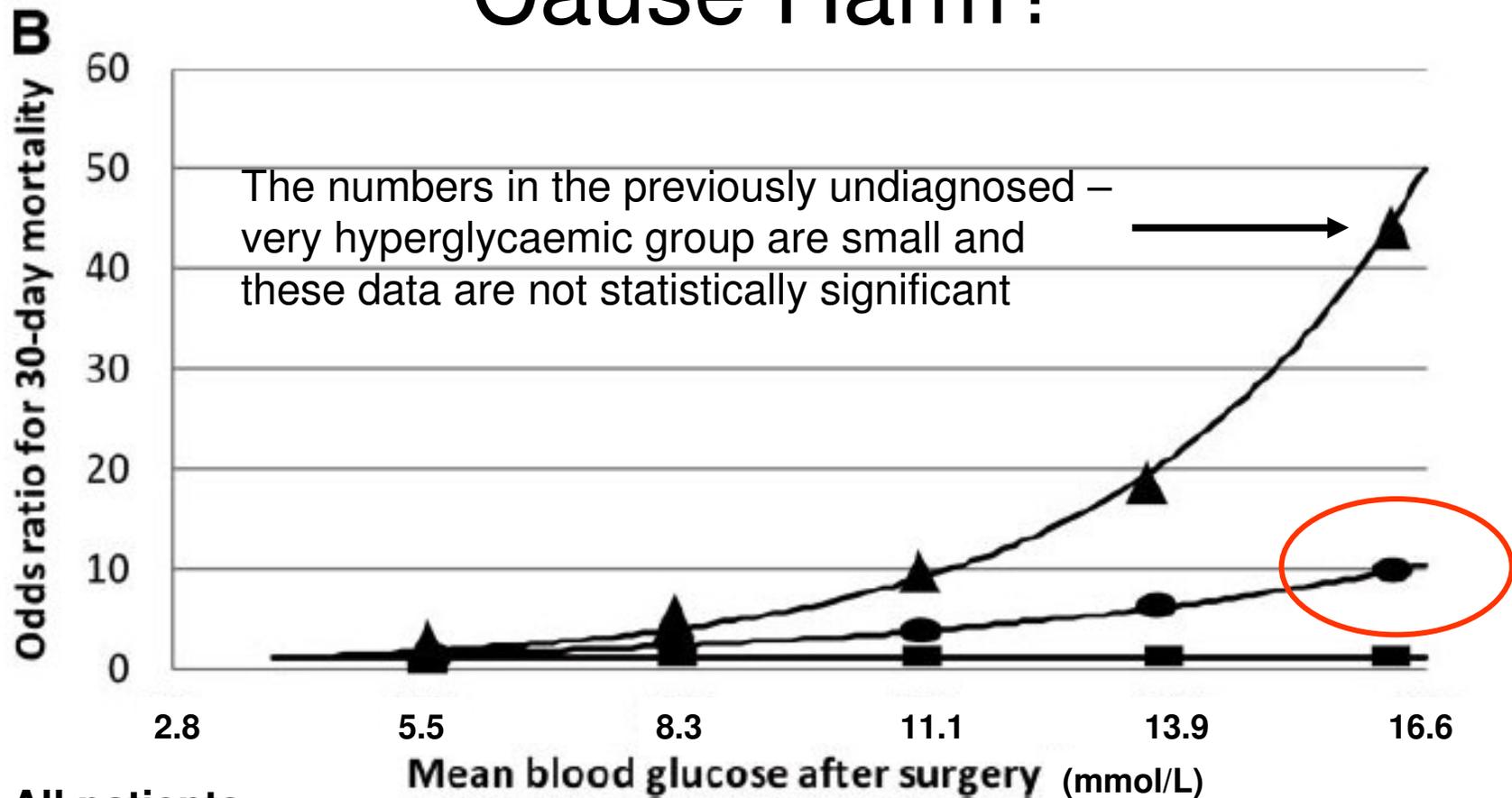
- All patients
- Patients with diabetes
- ▲ Patients without diabetes

# Do High Admission Glucose Levels Cause Harm?



- All patients
- Patients with diabetes
- ▲ Patients without diabetes

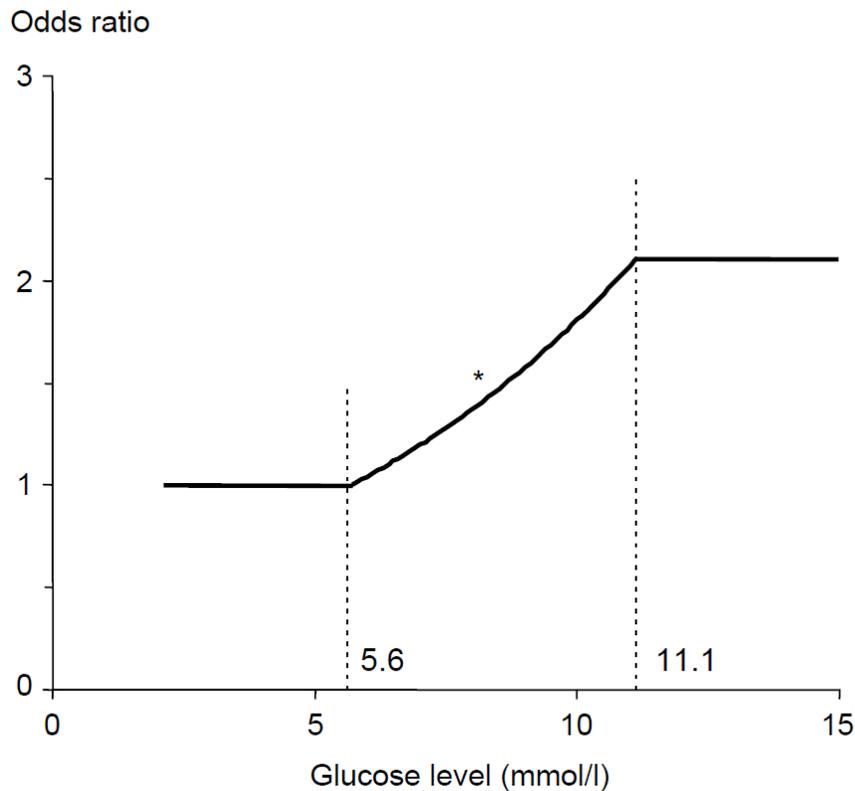
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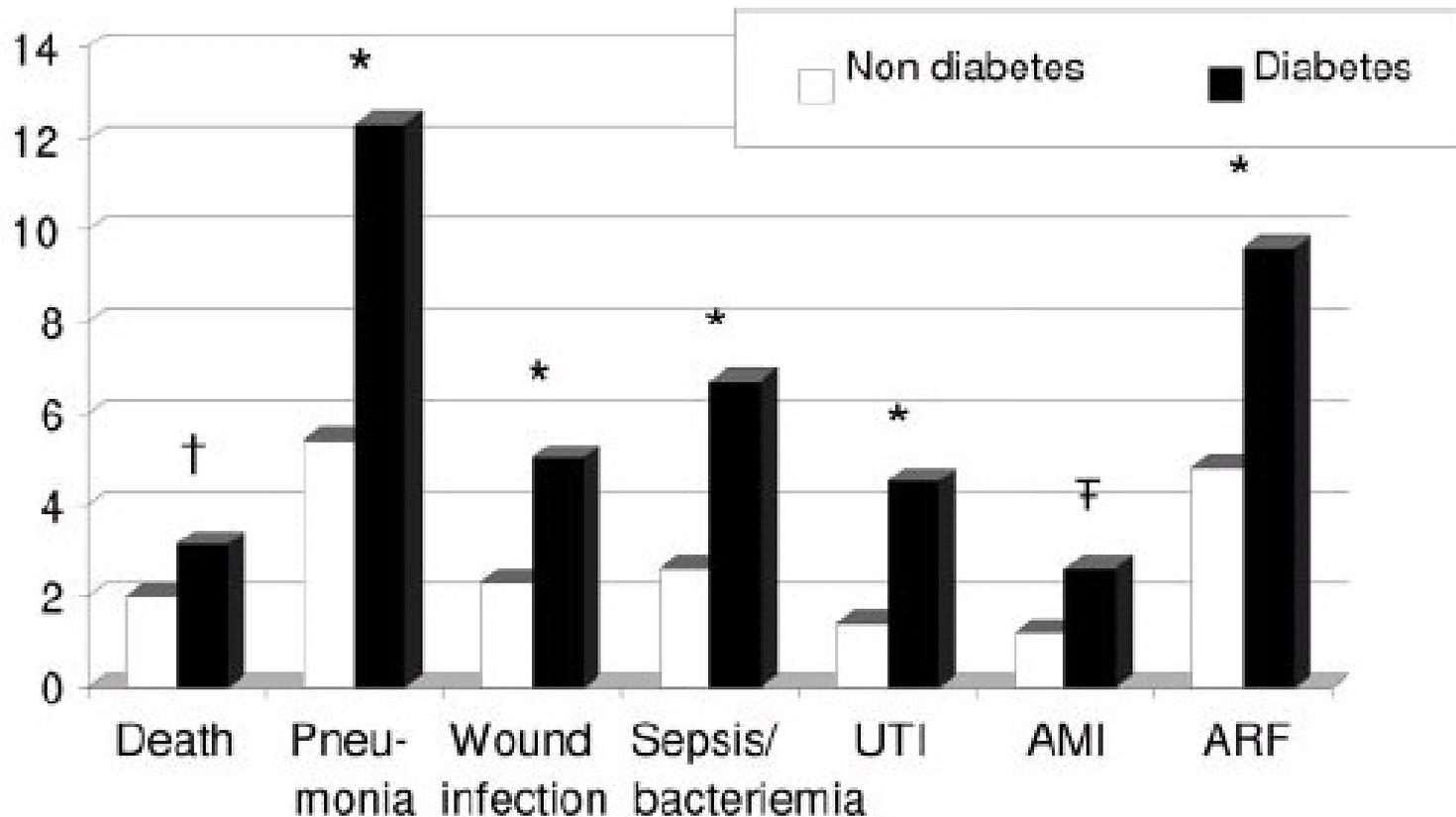
# However.....

- Other data has confirmed the harm of high pre-operative glucose levels in non-cardiac, non vascular surgery



30 day mortality rates for 989 patients with diabetes – for each mmol/L increase in blood glucose, OR for mortality rose by 1.19 (CI 1.1 - 1.3)

# Do High Admission Glucose Levels Cause Harm?



Fortunately  
There is  
This.....

**Diabetes UK Position Statements and Care Recommendations**

**NHS Diabetes guideline for the perioperative management of the adult patient with diabetes\***

K. Dhatariya<sup>1</sup>, N. Levy<sup>2</sup>, A. Kilvert<sup>3</sup>, B. Watson<sup>4</sup>, D. Cousins<sup>5</sup>, D. Flanagan<sup>6</sup>, L. Hilton<sup>7</sup>, C. Jairam<sup>8</sup>, K. Leyden<sup>3</sup>, A. Lipp<sup>1</sup>, D. Lobo<sup>9</sup>, M. Sinclair-Hammersley<sup>10</sup> and G. Rayman<sup>11</sup>  
for the Joint British Diabetes Societies

Diabet. Med. 29, 420–433 (2012)

The image shows the cover of an NHS Diabetes guideline. At the top left, there is a horizontal timeline with five stages: 'Preoperative Care', 'Preoperative Assessment', 'Hospital Admission', 'Theatre and Recovery', and 'Discharge'. The 'Preoperative Assessment' and 'Theatre and Recovery' stages are highlighted in green. The NHS logo is in the top right corner, with the word 'Diabetes' below it. The main title, 'Management of adults with diabetes undergoing surgery and elective procedures: improving standards', is written in red. At the bottom right, the slogan 'Supporting, Improving, Caring' is visible. The background features a large, 3D-style puzzle piece graphic.

Supporting, Improving, Caring

# National Guidelines

- Document divided into sections:
  - Primary care
  - Surgical outpatients
  - Pre-operative assessment clinic
  - Hospital admission
  - Theatre and recovery
  - Post-operative care
  - Discharge



# Primary Care Responsibilities

- Duration and type of diabetes
- Place of usual diabetes care (primary or secondary)
- Other co-morbidities
- Treatment
  - for diabetes oral agents/ insulin doses and frequency
  - for other co-morbidities
- Complications
  - At risk foot
- Renal impairment
- Cardiac disease
- Relevant measures
- BMI
- BP
- HbA1c
- eGFR



# Data from Our Acute Medical Unit

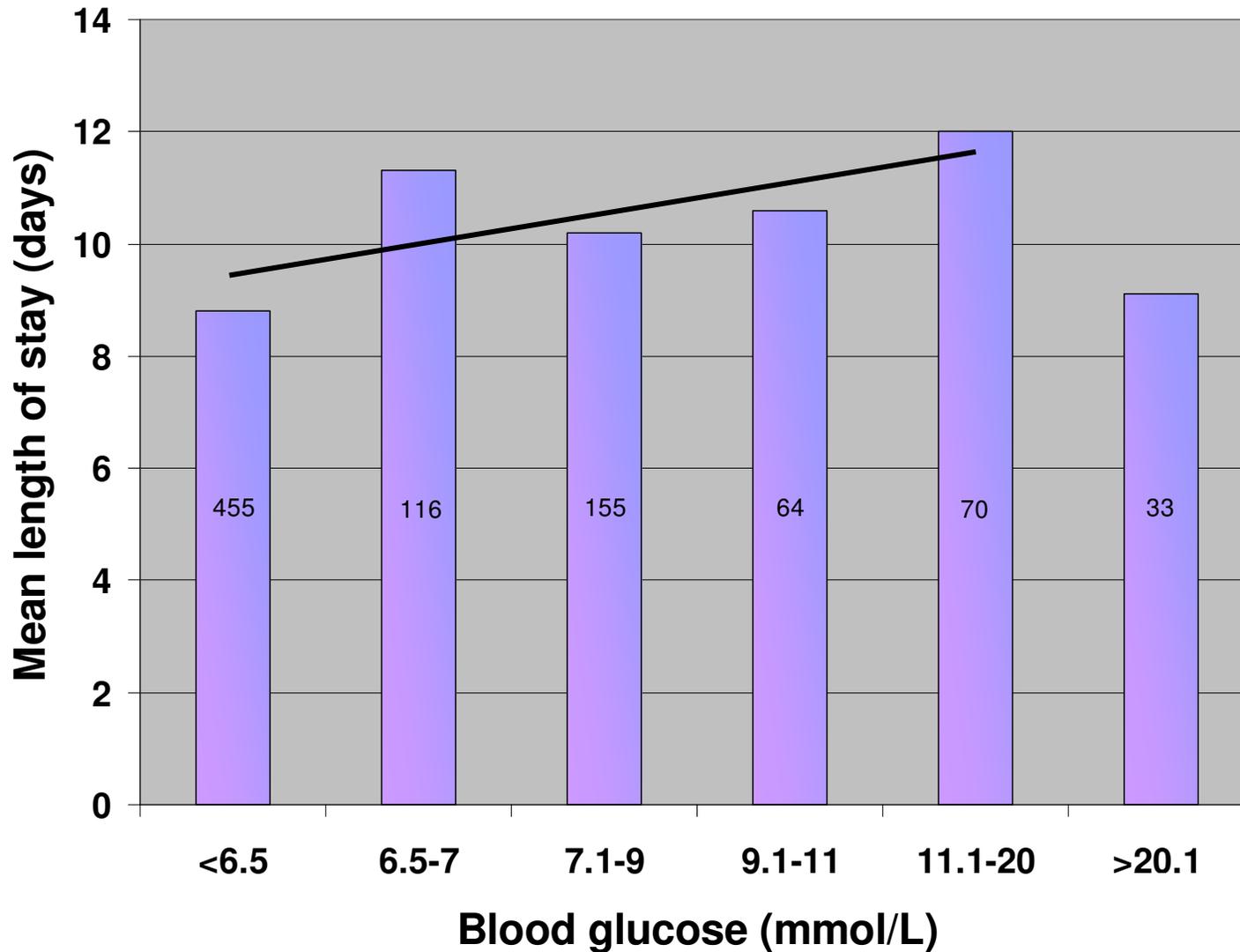
# NNUH Data

- We analysed the data for all 1,502 patients admitted through our AMU in February 2010
- Our average MAU intake is 60 patients every 24 hours
- We assessed
  - admission blood glucose
  - LOS
  - 28-days readmission and mortality
  - whether admission blood glucose  $\geq 11.1$  mmol/l in non-diabetic individuals was followed-up

# Who Admitted Them?

Specialty	Number of patients	Number with diabetes (%)
Medicine for the elderly	577	94 (16.3)
Cardiology	221	25 (11.3)
Respiratory	200	28 (14)
Nephrology	30	9 (30)
Gastroenterology	132	18 (13.6)
Endocrinology	30	22 (73)
Neurology	77	12 (16.9)
Dermatology	1	0 (0)
Haematology	16	0 (0)
Oncology	56	4 (7.4)
General medicine	162	27 (16.7)

# LOS vs Admission Glucose

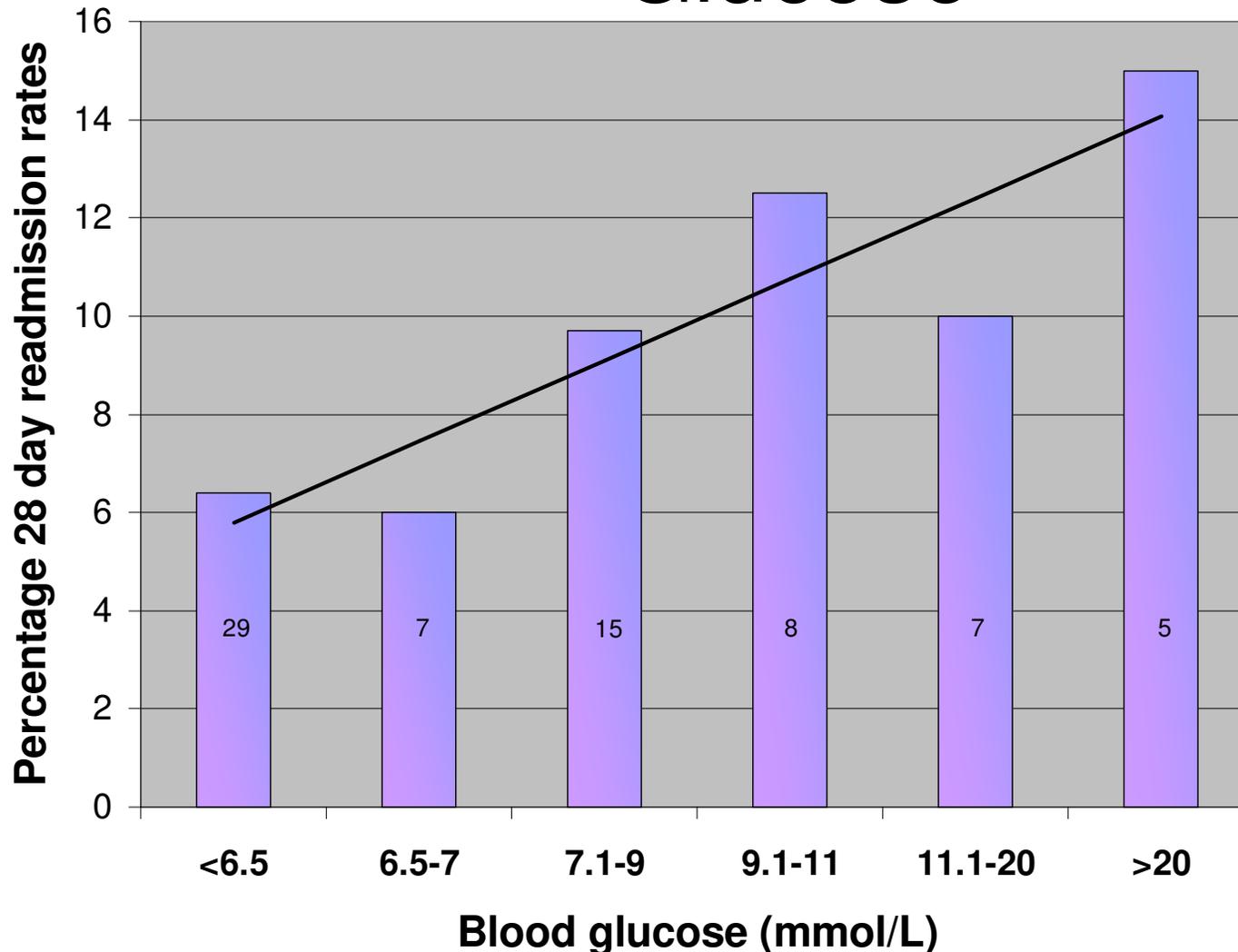


Trend  $R^2 = 0.5556$

$P=0.002$

Those above 20mmol/L excluded (most under the diabetes team)

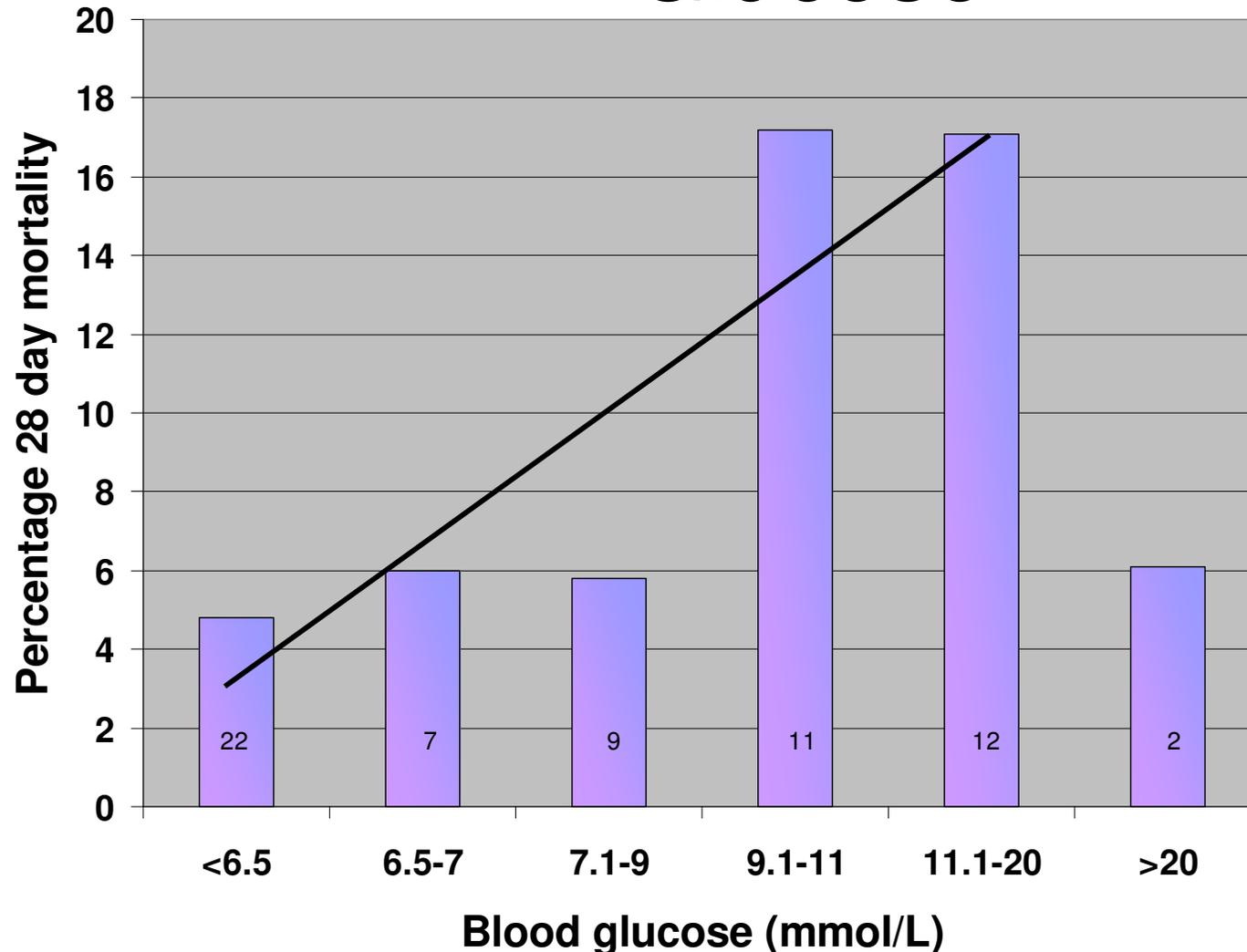
# 28 Day Readmission vs Admission Glucose



Trend  $R^2 = 0.7918$

Of the 1,502 admissions in February 2010, 71 (4.73%) were readmitted within 28 days

# 28 Day Mortality vs Admission Glucose



Trend  $R^2 = 0.7874$

$P < 0.0001$

Of the 1,502 admissions in February 2010, 63 (4.19%) died within 28 days

# The Future

- First – a glimpse into the murky past of diabetes related eye disease
- In 1978 Kelly M West wrote “The extent to which the level of hyperglycaemia determines the risk of retinopathy is not at all clear. This is the most important issue at hand and deserves high priority in epidemiologic research”

# What is Lacking?

- Interventional studies to show that lowering glucose makes a difference to outcomes
- The will to make this happen

# Guidelines

# Documents to Help

Joint British Diabetes Societies  
Inpatient Care Group

The Hospital Management of  
Hypoglycaemia in Adults  
with Diabetes Mellitus

Management of adults with  
diabetes undergoing surgery and  
elective procedures:  
improving standards

Self-management of  
diabetes in hospital

Joint British Diabetes Societies  
for Inpatient Care Group

SPECIAL FEATURE

Clinical Practice Guideline

**Management of Hyperglycemia in Hospitalized  
Patients in Non-Critical Care Setting: An Endocrine  
Society Clinical Practice Guideline**

*(J Clin Endocrinol Metab 97: 16–38, 2012)*

# What Can You Do?

- Try and get data from your own units – and publish it!
- Try and disseminate the knowledge contained in the guidelines – especially the peri-op one
- Be an advocate for diabetes



# A Mishmash of Inpatient Diabetes Care

Thank you for your attention

21<sup>st</sup> April 2012

[www.norfolkdiabetes.com](http://www.norfolkdiabetes.com)

