

Glycaemic control in people with diabetes on maintenance haemodialysis



Disclosures

- Receipt of research grants
Preparation of educational materials
Attendance at drug advisory boards

Boehringer Ingelheim/Lilly Alliance

AstraZeneca

Novo Nordisk

Merck Sharp & Dohme

Johnson & Johnson

Napp Pharmaceuticals



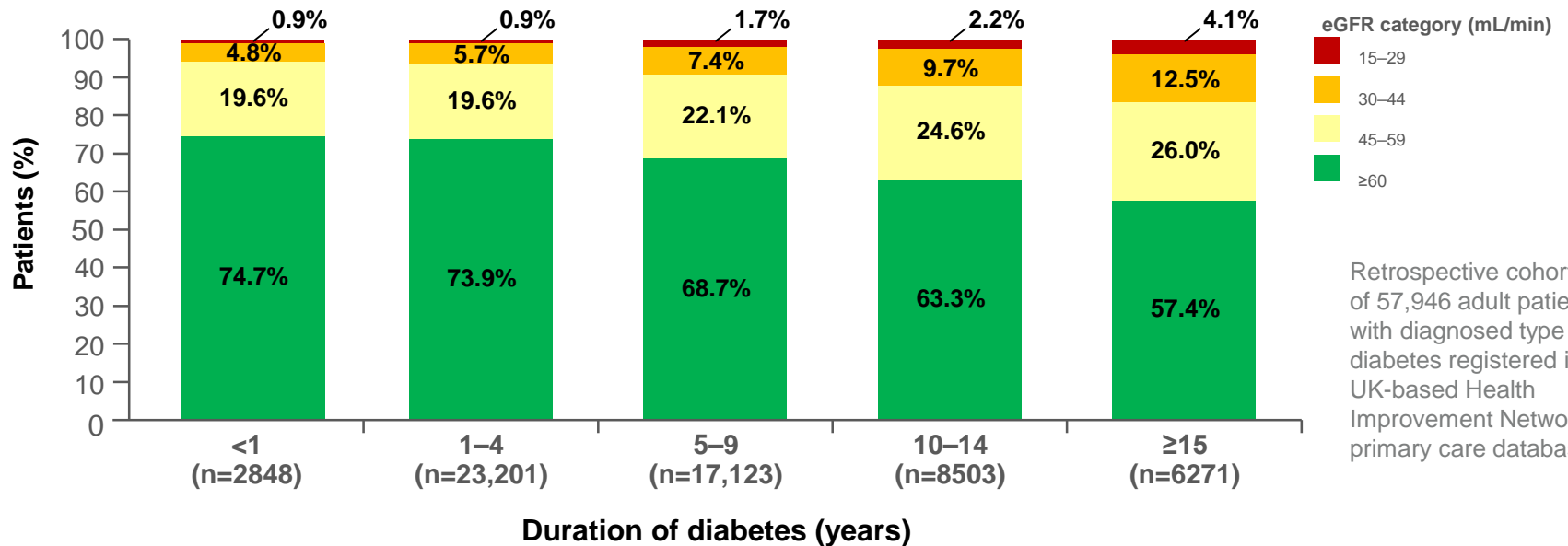
Glycaemic control in people with diabetes on maintenance haemodialysis

Learning Objectives

- Appreciate that the number of people with diabetes needing end-stage renal failure treatment in the next 10 years is likely to increase significantly
- Gain an understanding of the particular needs relevant to a person with diabetes on maintenance haemodialysis
- Consider how care for people with diabetes on your local haemodialysis unit is delivered - is there a viable model that supports the individual or is it all “left to chance”
- Understand that hypoglycaemia is a far bigger concern for a person with diabetes on haemodialysis than poor glycaemic control
- Appreciate the different ways you can use to assess and monitor blood glucose control in a person on maintenance haemodialysis and consider this when developing care plans for such individuals



Renal decline with duration of type 2 diabetes



A longer duration of type 2 diabetes is associated with a lower eGFR¹

Cea Soriano L, et al. Cardiovasc Diabetol 2015;14:38

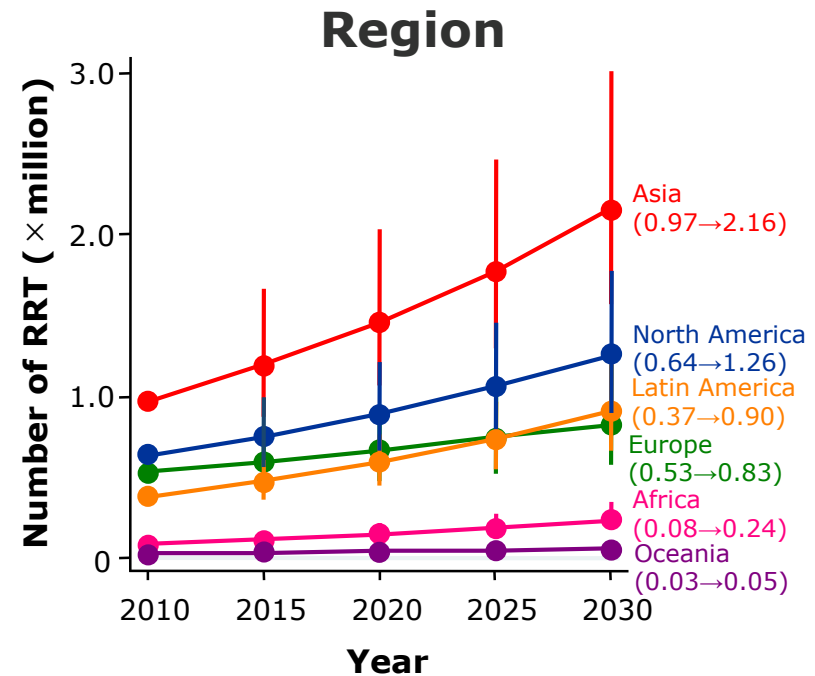
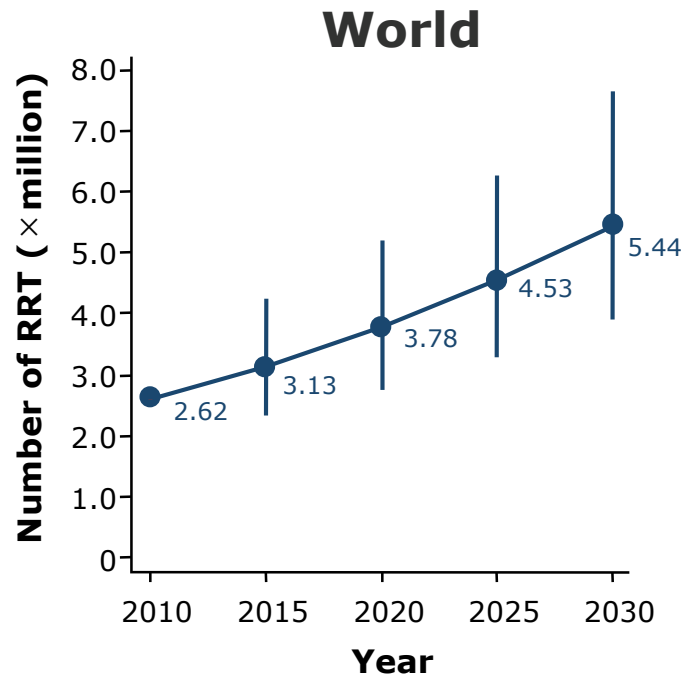


The prevalence of diabetes

UK Renal Registry Report	2004	2010	2014
Prevalent Population	37848	50965	59000
% Primary Diagnosis Diabetes	12.1	14.9	16.1
No Diabetes Primary Diagnosis	4579	7593	9499
Incident Population	6088	6023	7411
% Primary Diagnosis Diabetes	21.4	24.2	26.9



Number of People Receiving Renal Replacement Therapy Is Projected to Double

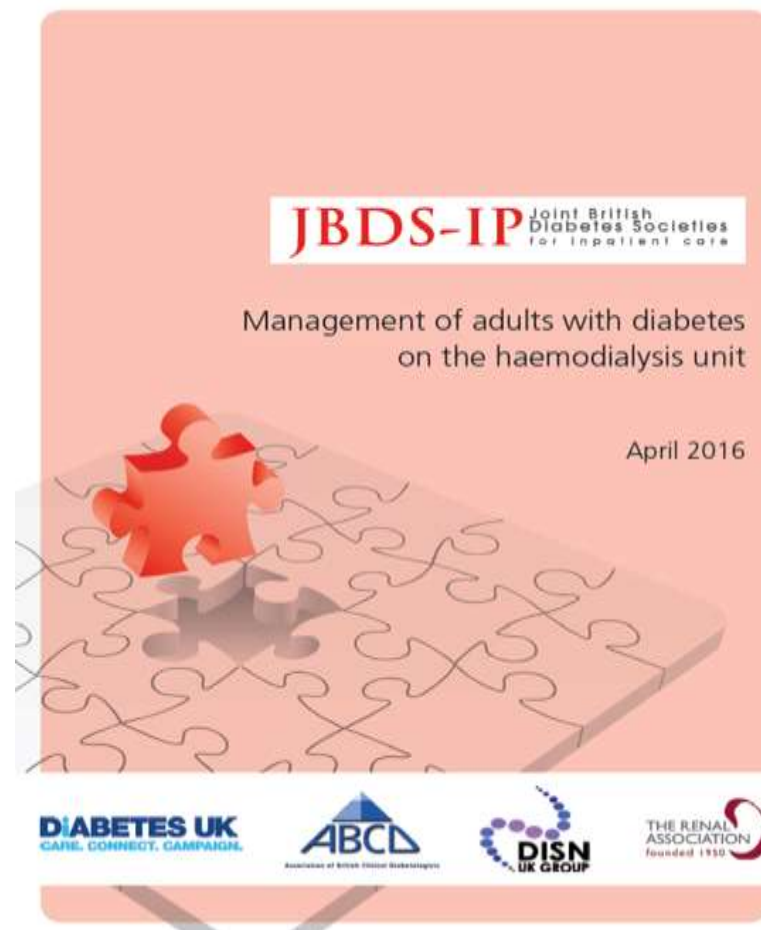


Which Guideline?



Which Guideline?

- a. NICE TYPE 2 DIABETES GUIDELINE
- b. NICE CKD 2014 GUIDELINE
- c. ADA/EASD GUIDELINE
- d. JBDS GUIDELINE**



DIABETES IN A PERSON ON HAEMODIALYSIS – THE IMPLICATIONS

- What are the key issues you need to consider in a person with diabetes on haemodialysis



DIABETES IN A PERSON ON HAEMODIALYSIS – THE IMPLICATIONS

- What are the key issues you need to consider in a person with diabetes on haemodialysis
 - Organisation of care
 - The aims of good care – preventing hypoglycaemia
 - Assuring your patients are achieving good outcomes rather than good “sugar” levels
 - Assessment of glycaemia
 - What treatments are available



ORGANISATION OF CARE



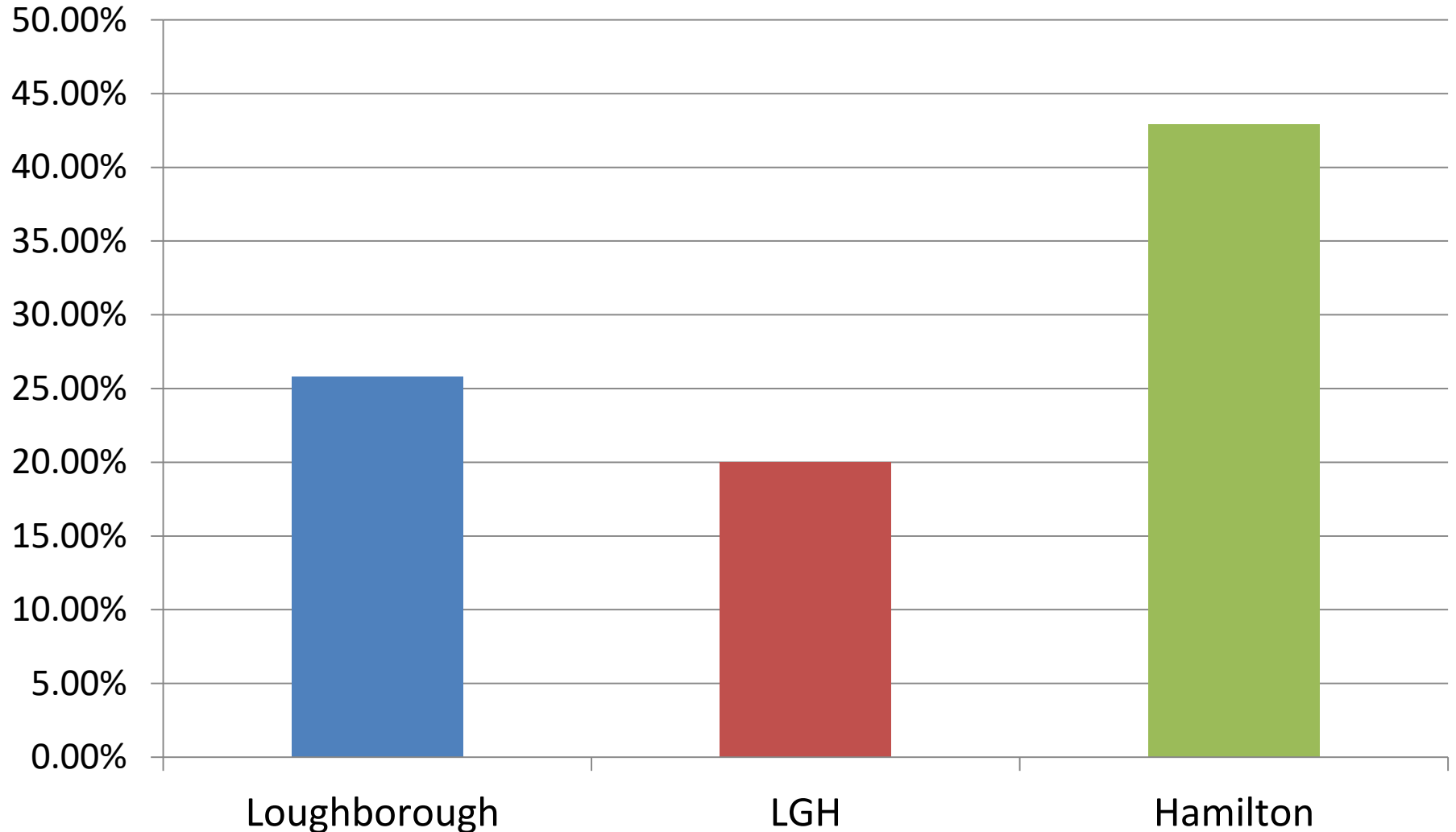
Glasgow Experience

- 192 of a total of 588 people on HDx
- 23 Type 1, 165 Type 2, 4 others
- Only 93 (48.4%) DM as primary renal diagnosis
- In preceding year only 42% of T2DM had contact with diabetes specialist
- 97 on insulin, 28 on OHA, 67 no treatment

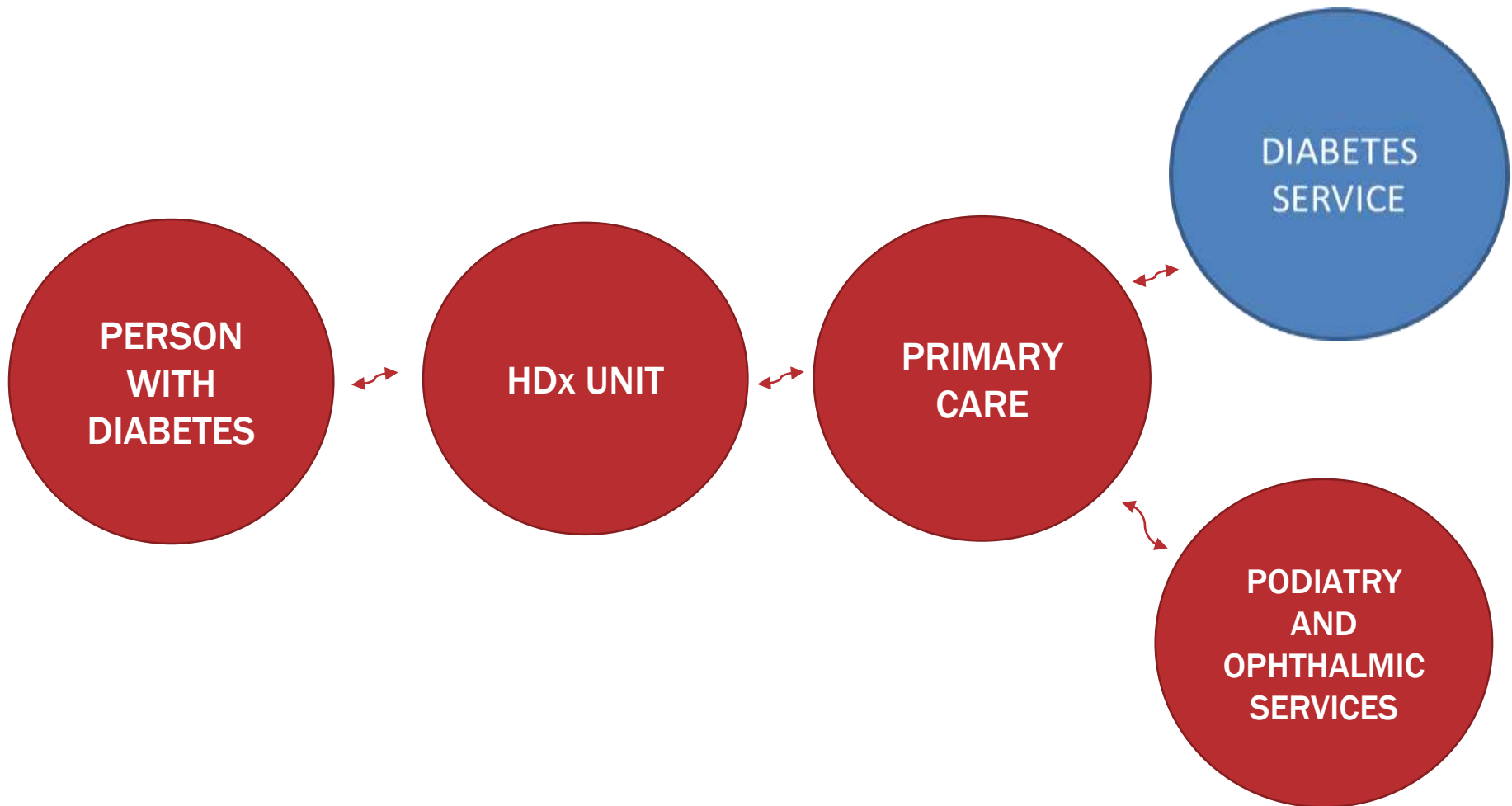
McQuarrie et Al, Glasgow Renal Transplant Centre, Renal Association 2015



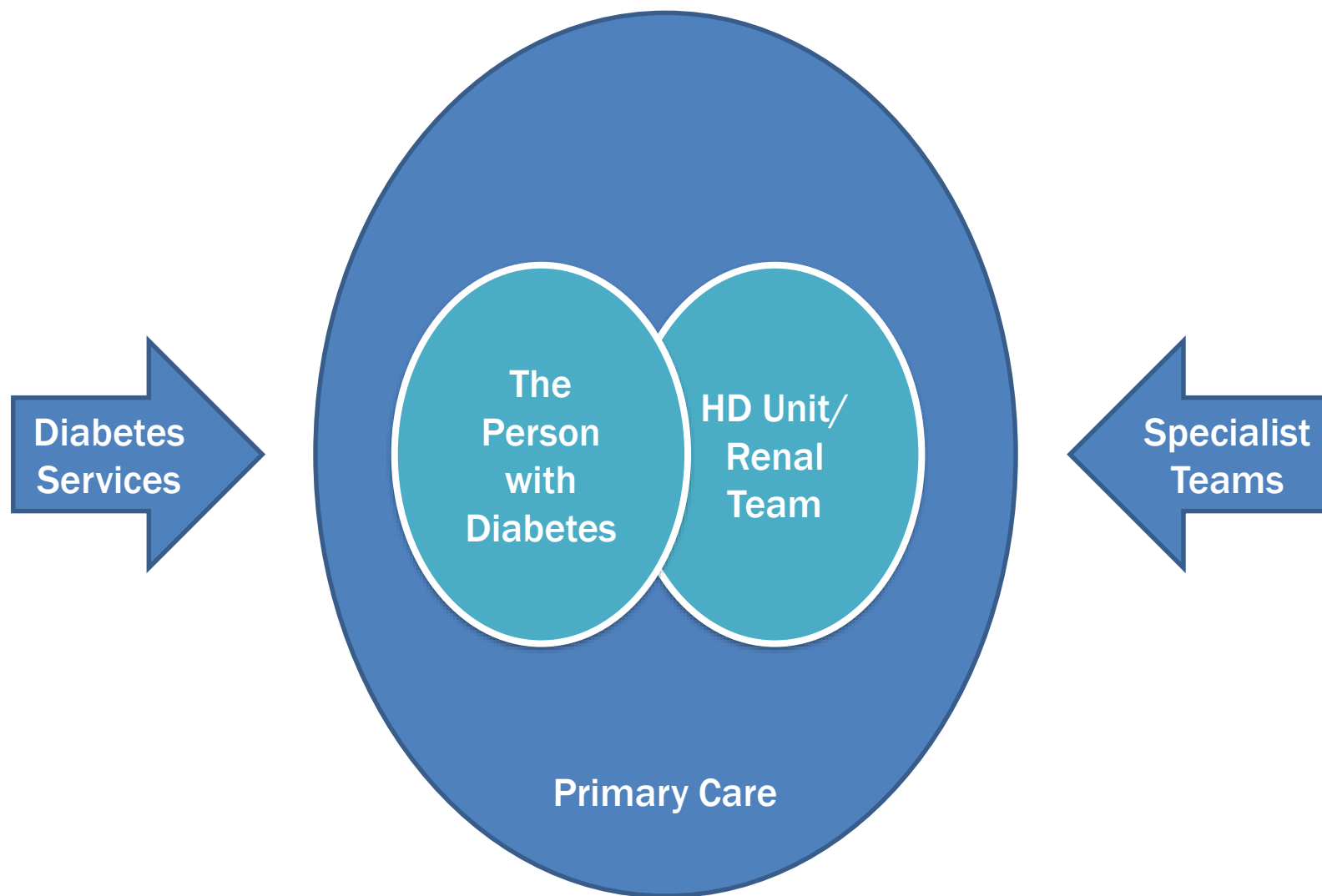
Percentage of people who report not having had a Diabetes review in the last year



How care is currently organised



How care is should be organised



Organisation of Care

Key Recommendations

- Care needs to be centred around the individual
 - Recognition of the needs of a person dialysing 3 times per week
 - Information needs to be shared across systems
- Requirement for regular access to DSN who has a linked relationship with the HDx staff
- Requirement for annual review and regular monitoring coordinated via trained link nurse network
- Different units will require their own strategies depending on the setup of local services



The assessment of glycemia on the haemodialysis unit

- Why do you assess glycaemia in a person with diabetes on haemodialysis?



The assessment of glycemia on the haemodialysis unit

- How do you assess glycaemia in a person with diabetes on haemodialysis?



The assessment of glycemia on the haemodialysis unit

- How do you assess glycaemia in a person with diabetes on haemodialysis?
 - Urine testing!
 - Blood Glucose Monitoring pre and post dialysis
 - HbA1C
 - Continuous Glucose Monitoring
 - New technologies

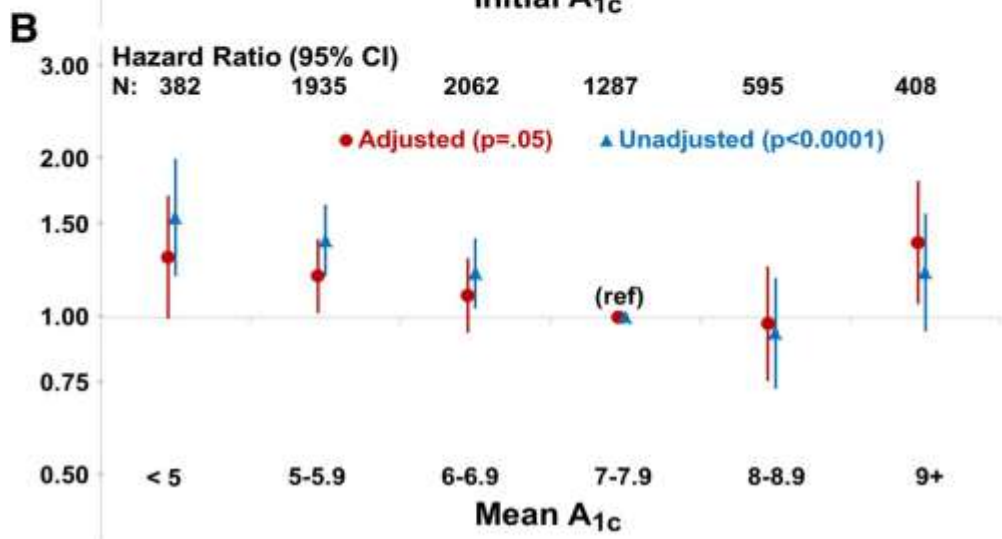
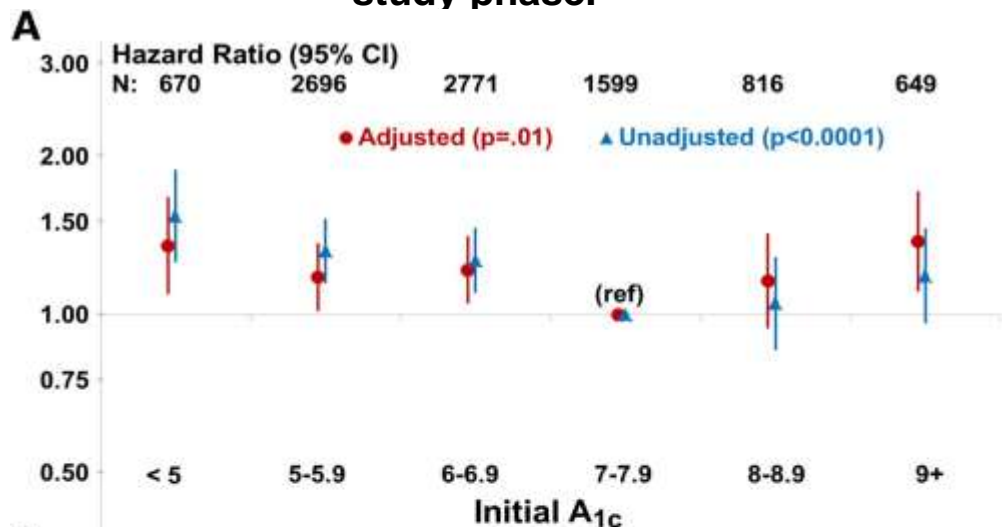


The assessment of glycemia

- HbA1C remains the commonest method of chronic monitoring



A: Risk of mortality by initial A1c, adjusted for age, sex, race, BMI, years of dialysis, albumin, creatinine, 10 comorbid conditions, insulin use, hemoglobin, HDL cholesterol, country, and study phase.



Ramirez S P B et al. Dia Care 2012;35:2527-2532



Target HbA_{1c}

Type 1 Diabetes

– CKD stages 1 and 2	48 – 58mmol/mol
– CKD stages 3 and 4	58 – 62mmol/mol
– CKD stage 5 (incl dialysis)	58 – 68mmol/mol

Type 2 Diabetes

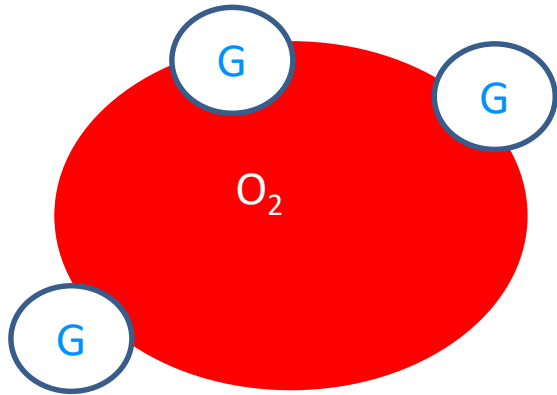
– CKD stages 1 and 2	48 – 58mmol/mol
– CKD stages 3 and 4 (on non-hypo-inducing agents)	52 – 58mmol/mol
– CKD stages 3, 4 and 5 (incl on dialysis; on hypo-inducing agents)	58 – 68mmol/mol

Adapted from ABCD/RA Guidelines 2018

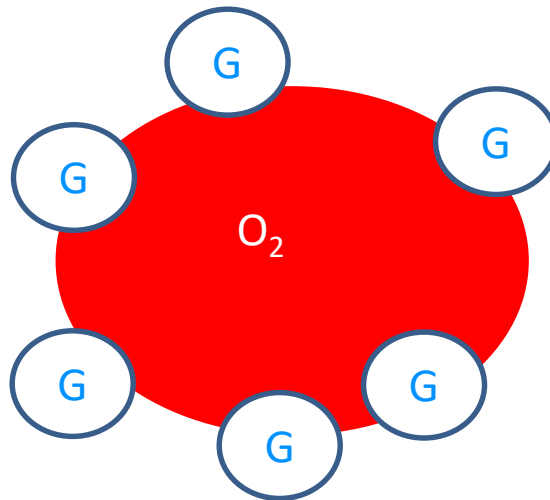
Mark PB and Winocour P. Association of British Clinical Diabetologists - Renal Association (ABCD-RA) Clinical Practice Guidelines for Management of Lipids in Adults with Diabetes Mellitus and Nephropathy and/or Chronic Kidney Disease (2017). Clinical practice guidelines-Lipid management in DN &/or DM CKD. Available at: <https://bit.ly/2qS77yu>. (accessed 20.11.18).



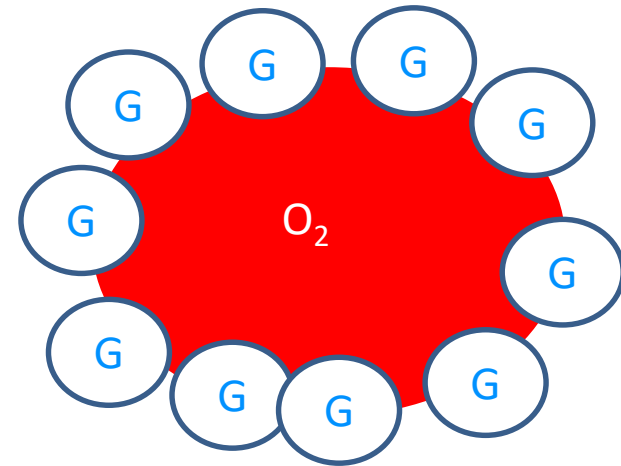
HbA1C on Haemodialysis



Normal HbA1c
is 19 - 41
mmol/mol



Impaired glucose
regulation or
non- mmol/mol



In Type 2 diabetes target
HbA1c is
≥ 48mmol/mol in most
individuals

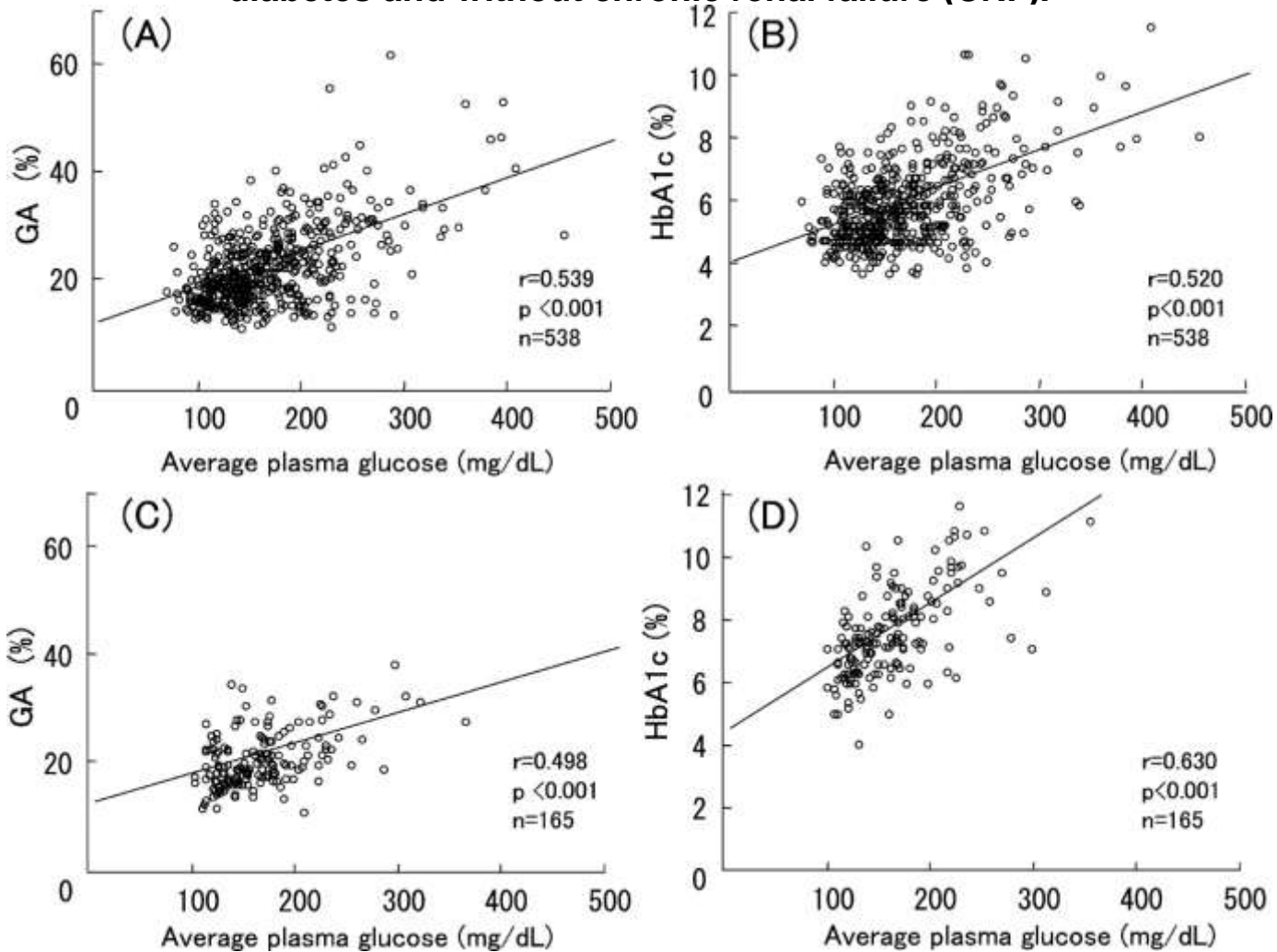


The assessment of glycemia

- HbA1C remains commonest method of monitoring - **We know this is sub-optimal**
- HbA1C underestimates EAG (Estimated Average Glucose) especially when HbA1C <58 (7.5%) – Influenced by :
 - Red cell survival
 - EPO use and dose
 - Transfusion
 - Iron status



Correlation between the average plasma glucose (PG) values and glycated albumin (GA) or glycated hemoglobin (HbA1c) in hemodialysis (HD) patients with diabetes and in patients with diabetes and without chronic renal failure (CRF).



Masaaki Inaba et al. JASN 2007;18:896-903

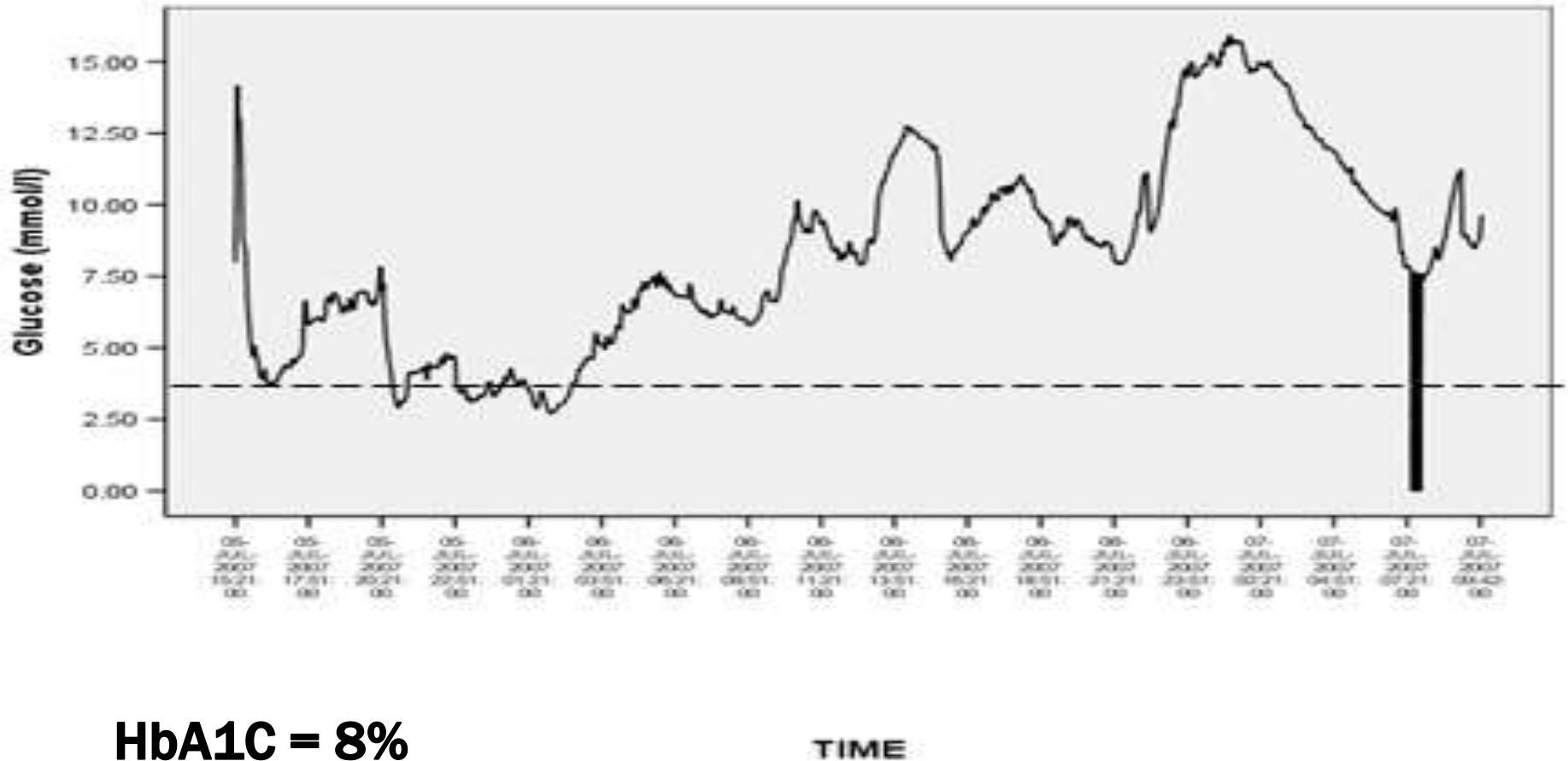
CGM and New Technologies



HOW IS GLYCAEMIA AFFECTED BY DIALYSIS?



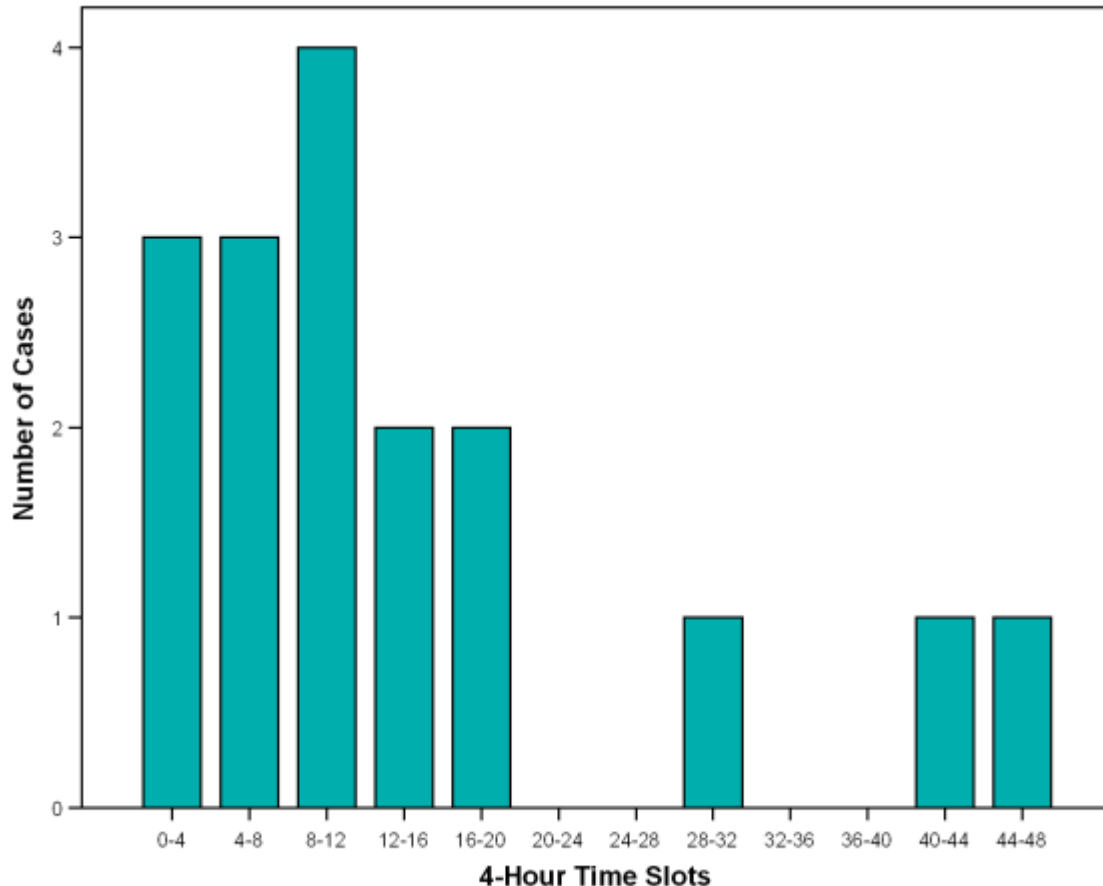
Continuous Glucose Monitoring 48 hour HD cycle



HbA1C = 8%



Post Haemodialysis Hypoglycaemia



- Defined as an episode of hypoglycaemia (<2.5 mmol/L), symptomatic or not, that occurred within 24 hours of HD
- 3/17 persons
- **BUT**
- 14/17 reached their lowest glucose reading within 24 hours of their HD session

Kazempour et al Diabetes Care. 2009 Jul;32(7):1137-42



HYPOGLYCAEMIA AND CKD

- Decreased renal gluconeogenesis
- Decreased insulin degradation
- Decreased drug clearance

- Variations in food intake

- Decrease insulin secretion
- Insulin resistance increased

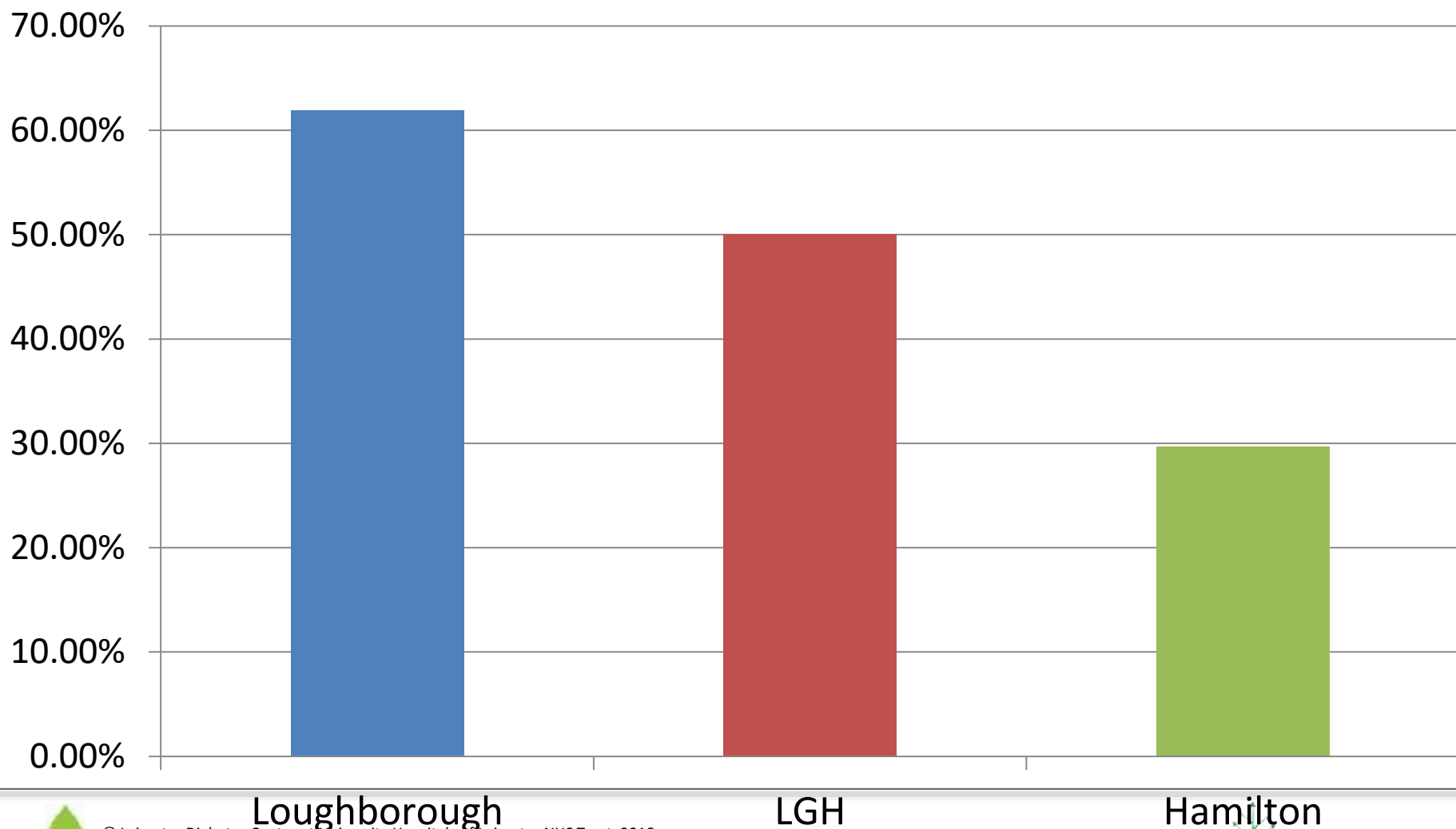


Glycaemic management in people with T2DM on HD – Key Messages

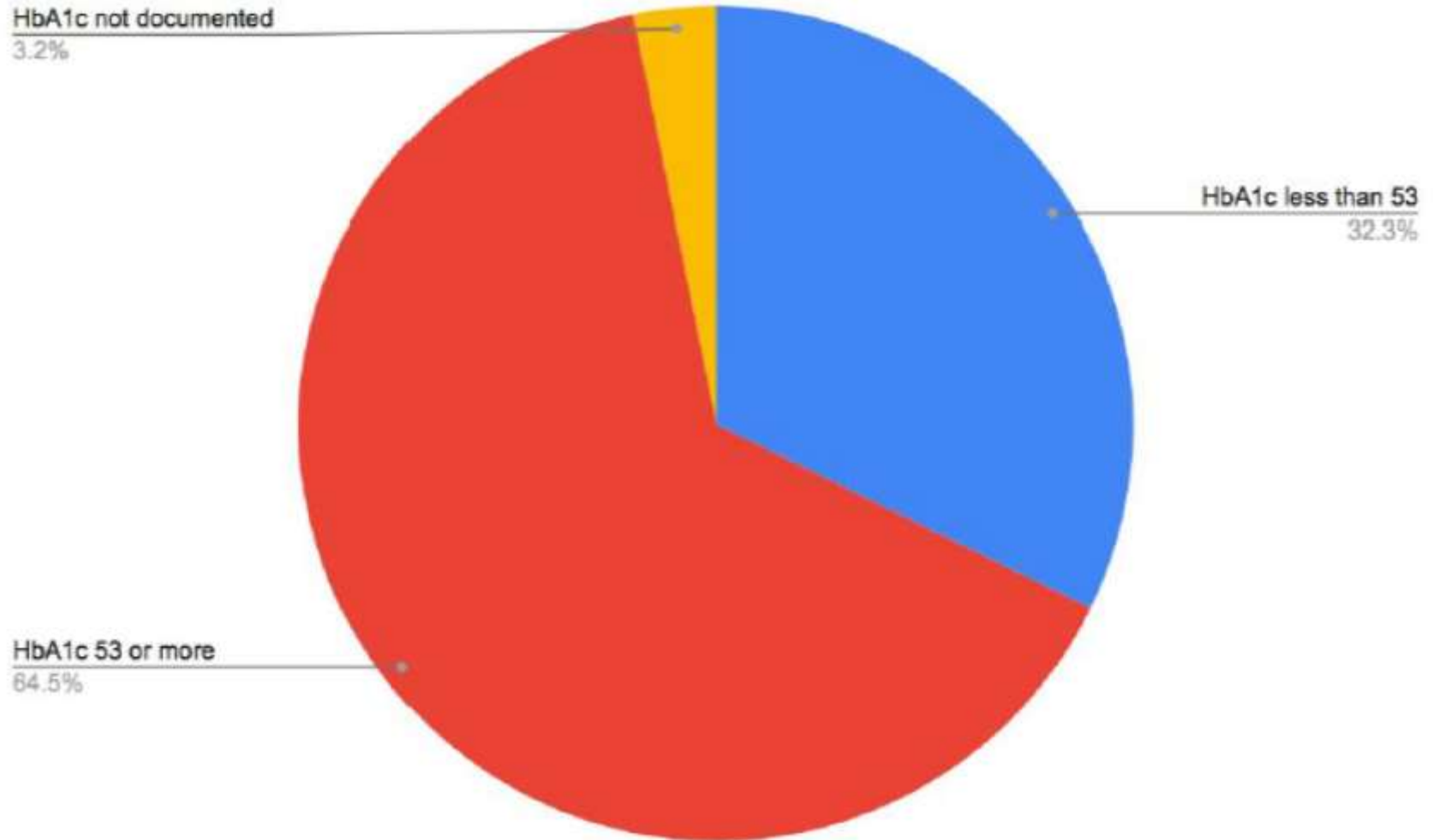
- Glycaemic ranges need to be individualised for people with type 2 diabetes and advanced CKD
- The aim should be to balance the better overall glycaemic control with reduced risk of both hypoglycaemia and glycaemic variability
- If the person is on a hypoglycaemia inducing agent the target HbA1c is 58 to 68 (7.5% to 8.5%)
- Reduction of treatment should be considered for individuals with an HbA1c <58 (7.5%) and on hypoglycaemic agents
- **MAY REQUIRE MOVEMENT TO INTERMITTENT CGM OR USE OF NEW TECHNOLOGIES WHERE APPROPRIATE**



Percentage of people on hypoglycaemic medications with HbA1c <53mmol/mol (7.0%)



Patients with diabetes on insulin or sulphonylureas



Treatment options for diabetes has expanded enormously over the last 20 years – but treatments for people on haemodialysis remain limited

- Metformin
- Sulphonylureas
- Glinides
- Pioglitazone
- DPP4i inhibitors
- GLP1 agonists
- SGLT2 inhibitors
- Insulins





DiABETES UK
KNOW DIABETES. FIGHT DIABETES.



THE RENAL
ASSOCIATION
founded 1950



DiH Work Programme

- Standards
- Audit Tool
- Engagement of haemodialysis staff
- Sharing and disseminating good practice
- Education
 - Face to Face
 - E learning
- Patient empowerment



Standards

- 1. All people with diabetes undergoing mHDx should have a documented annual review of their diabetes which includes review of glycaemic control, dietary review and foot and eye screening.
- 2. All people with diabetes on mHDx should have a clearly defined and personalised method of assessing glycaemic control agreed with and understood by the individual – this should include access to CGM where appropriate.
- 3. All people with diabetes and on mHDx with an HbA1C <58 who are on a hypoglycaemic treatment (insulin or sulfonylurea) should have had an intervention to minimise the risk of hypoglycaemia.



Standards

- 4. All people with diabetes and on mHDx with an HbA1C >80 should have had access to advice from the diabetes specialist team in order to facilitate improvement in glycaemic control.
- 5. All units should ensure that there is a clearly defined and easy to access rapid escalation pathway for patients with active foot complications.

The process for the delivery of these standards will vary from site to site depending on service configurations however responsibility for meeting these standards will ultimately lie with the service commissioners whilst the responsibility for recording achievement of standards rests with the mHDx unit service leads.



How will this affect you

What do you need to do



Links to where to go for more information

- 🔗 www.edendiabetes.com (Eden website)
- 🔗 www.diabetes.org.uk (DUK website)
- 🔗 TREND-UK.org.uk (Trend UK)

Questions & Discussion

