Older People with Diabetes – Key Aspects that underpin better care and management

Professor Alan Sinclair

Foundation for Diabetes Research in Older People and King's College, London

Foundation for Diabetes Research in Older People (*f*DROP) *Our mission and vision 2021-24*

Director: Professor Alan Sinclair

NAPCHD
National Advisory Panel on Care Home Diabetes

International Diabetes Federation

International Association of Gerontology

WHO

CareQuality Commission

Our mission

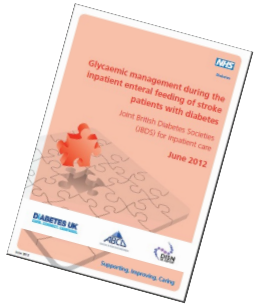
- As a ***not for profit research organisation***, to enhance the quality of diabetes care for older people through new initiatives in clinical practice, audit and research
- To provide a **forum for discussion** between health professionals and scientists, and involve people with diabetes, their carers and families, in programmes which promote their health and well-being
- To examine the relationship between diabetes and related metabolic disorders to the development of **frailty and sarcopaenia**

Our vision

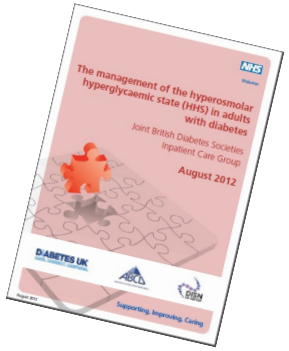
- Establish sustainable academic partnerships
- Ensure policies and strategies are developed to meet the needs of older people with diabetes and related metabolic disease

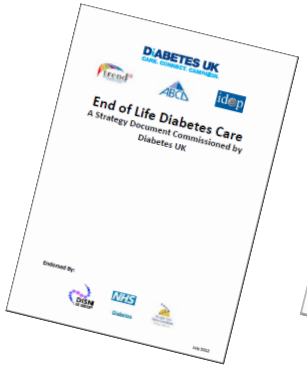
imi
Innovative Medicines Initiative

SEVENTH FRAMEWORK PROGRAMME



DEAKIN UNIVERSITY AUSTRALIA





KING'S College LONDON

Scope of my talk

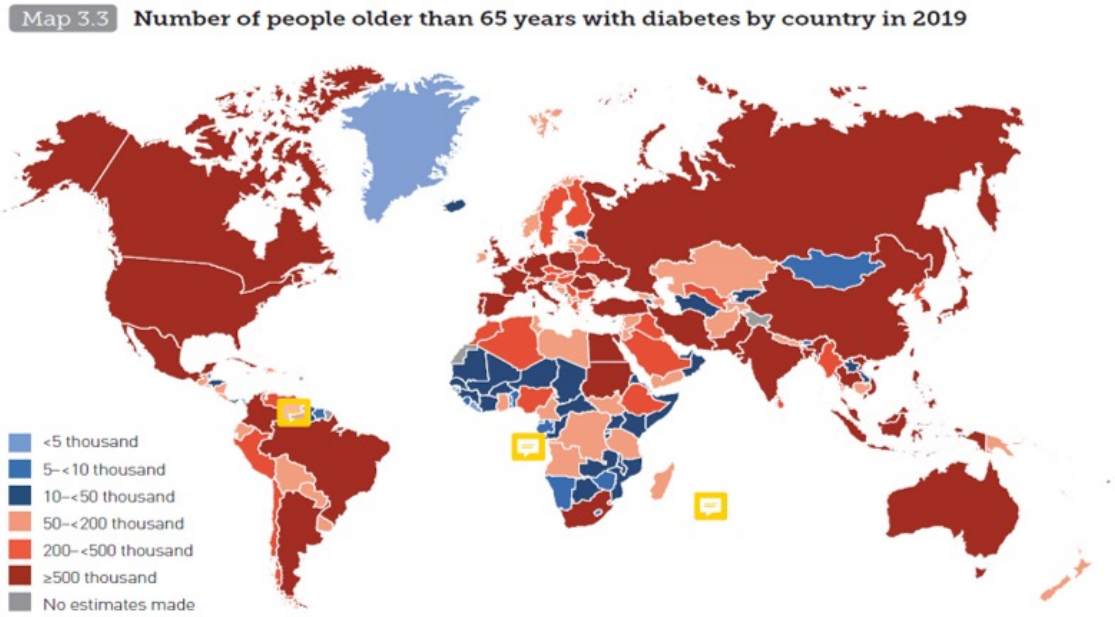
- To examine key aspects of diabetes and ageing
- To examine what constitutes the condition of type 2 diabetes in older adults
- To look at those factors that can influence the successful management of type 2 diabetes in older adults

Global diabetes rates in older people – findings from the IDF Atlas 9th edition. *Sinclair AJ et al. Diab Res Clin Pract 2020.*

Table 1: Global diabetes estimates in people older than 65 years in 2019, 2030 and 2045

	2017	2019	2030	2045
Adult population (65–99 years)	652.1 million	704.4 million	995.2 million	1.4 billion
Prevalence (65–99 years)	9.6% (15.4-23.4%)	19.3% (15.3–24.2%)[i]	19.6% (15.5–24.8%)	19.6% (15.2–25.4%)
Number of people older than 65 years with diabetes (65–99 years)	122.8 million (100.2-152.3)	135.6 million (107.6–170.6)	195.2 million (154.7–247.1)	276.2 million (214.8–358.9)

[i]95% confidence intervals are reported in brackets.



Diabetes in England

940k

Number of people with undiagnosed diabetes

3.8m

Number of people in England with diabetes

90%

% of diabetes cases which are Type 2, which is preventable

£8.8bn

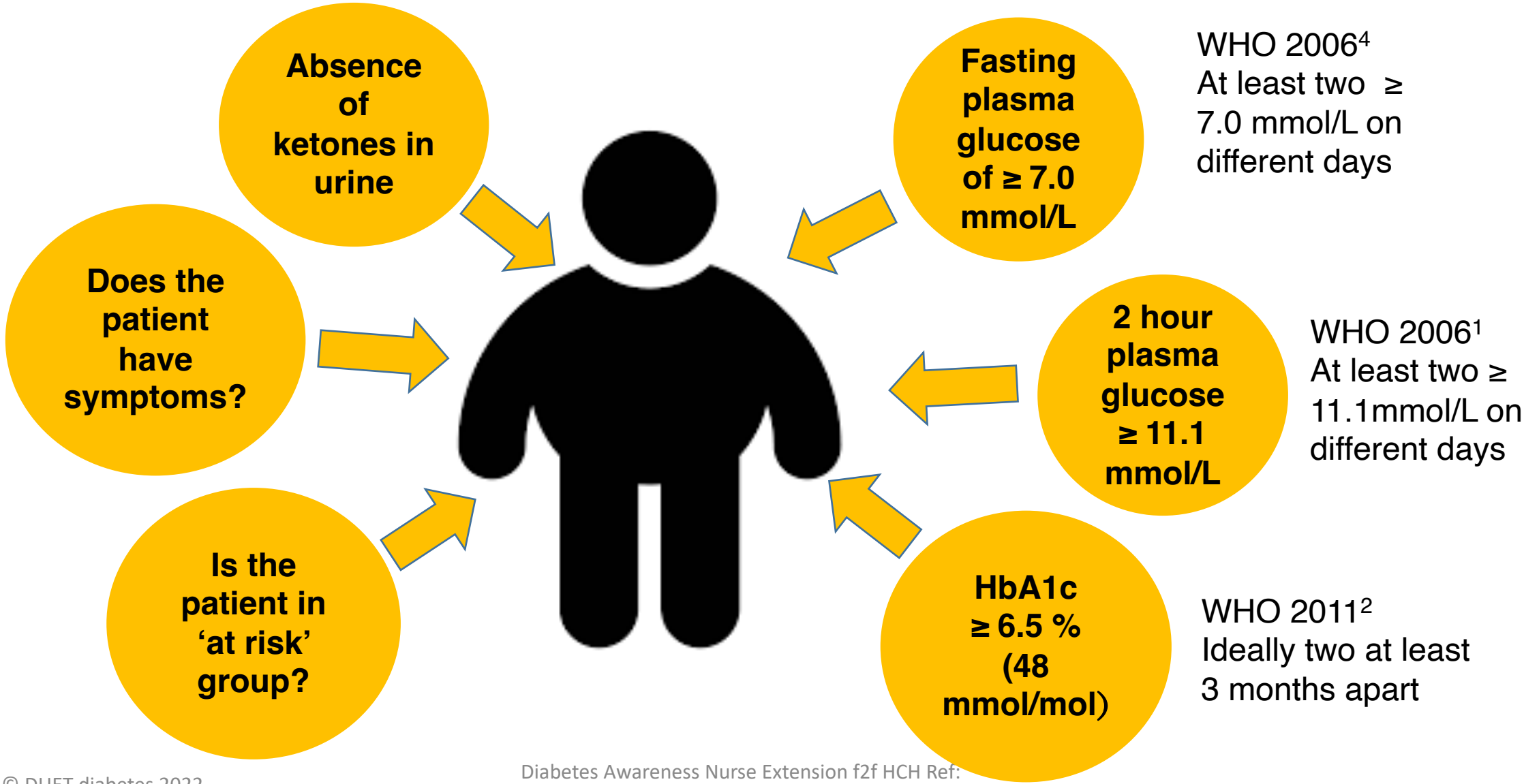
Current annual cost of Type 2 diabetes to the NHS

4.9m

Estimated diabetes cases by 2035

2016 diabetes prevalence model, National Cardiovascular Intelligence Network, PHE

Making a diagnosis of Type 2 Diabetes[1,2,18]



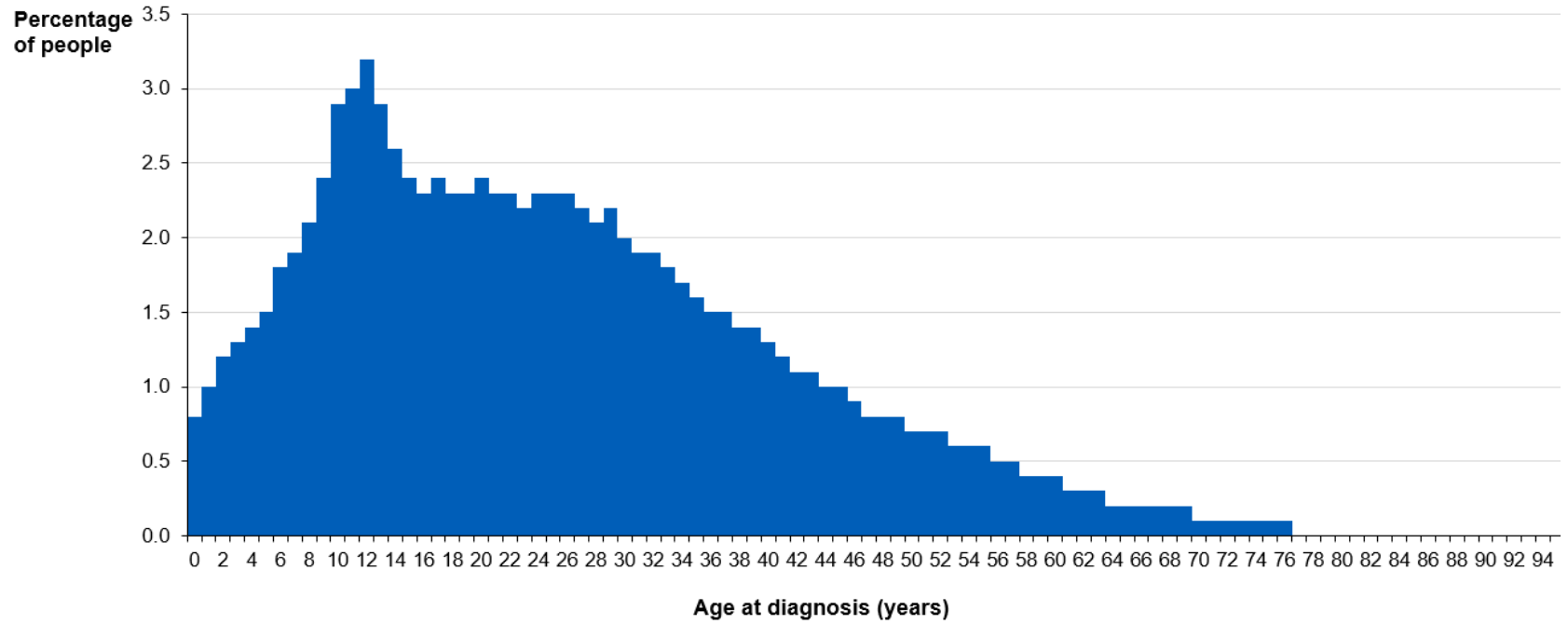
WHO 2006[4]
At least two ≥ 7.0 mmol/L on different days

WHO 2006[1]
At least two ≥ 11.1mmol/L on different days

WHO 2011[2]
Ideally two at least 3 months apart

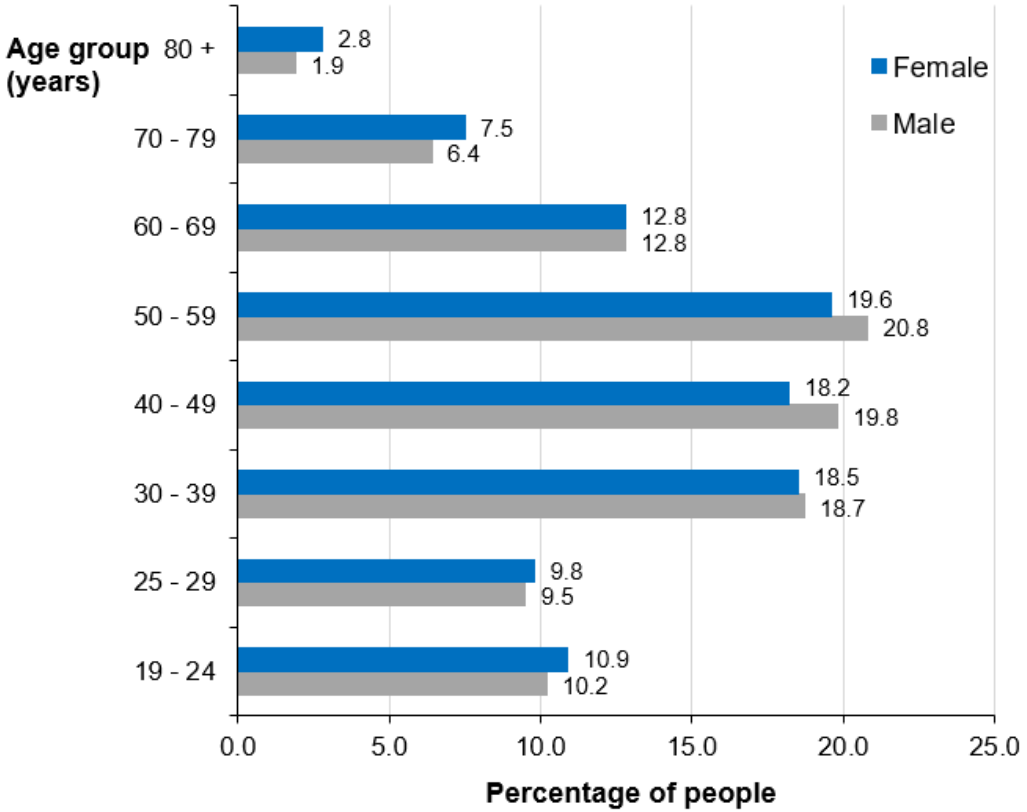
Type 1 diabetes in England & Wales – 2019-20 NDA Supporting Information

Figure 2: People with type 1 diabetes, by age of diagnosis*, England and Wales, 2019-20



Type 1 Diabetes – NDA 2019-20

Figure 1: People with type 1 diabetes, by age group and sex, England and Wales, 2019-20

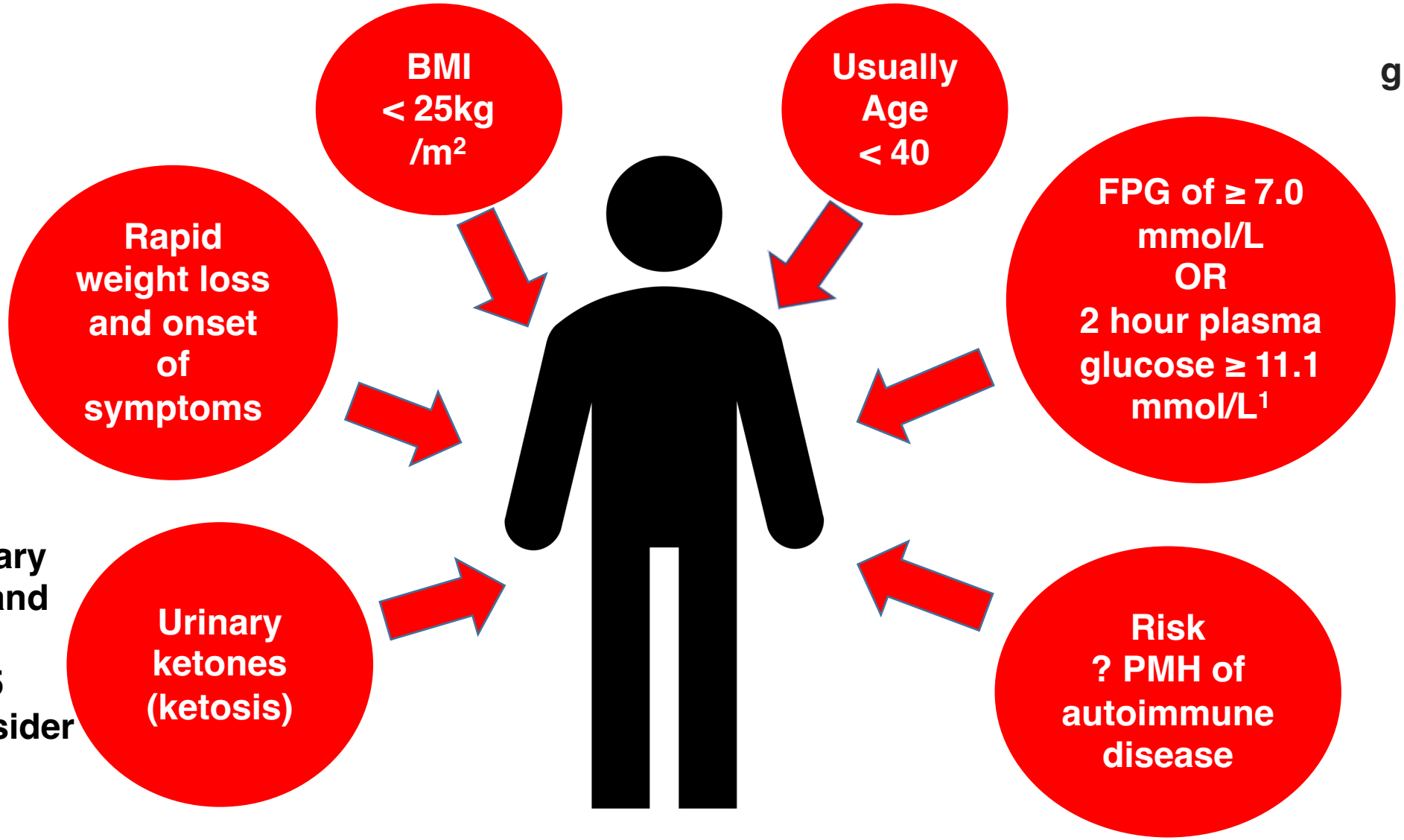


218, 670 confirmed and unconfirmed cases of type 1 diabetes: 56.9% Male

86.2% white
3.5% Asian
2.3% Black
2.1% Mixed/other
9.5% not known

Courtesy of Prof Robert Young; source NHS Digital

Making a diagnosis of Type 1 Diabetes[1,2,17]



Random plasma glucose of ≥ 11.1 mmol/L

If no urinary ketones and person is aged < 25 then consider MODY

Autoantibody Tests
Islet cell antibodies; ICA-GAD, etc

Prevalence of Diabetes Mellitus in Care Homes: *the Birmingham* and Newcastle Screening Studies

Sinclair AJ, Gadsby R, Croxson SCM et al, Diabetes Care 2001; *Aspray et al. Diabetes Care 2006,* ***29*** *(3):707-8*

Little evidence of structured diabetes care

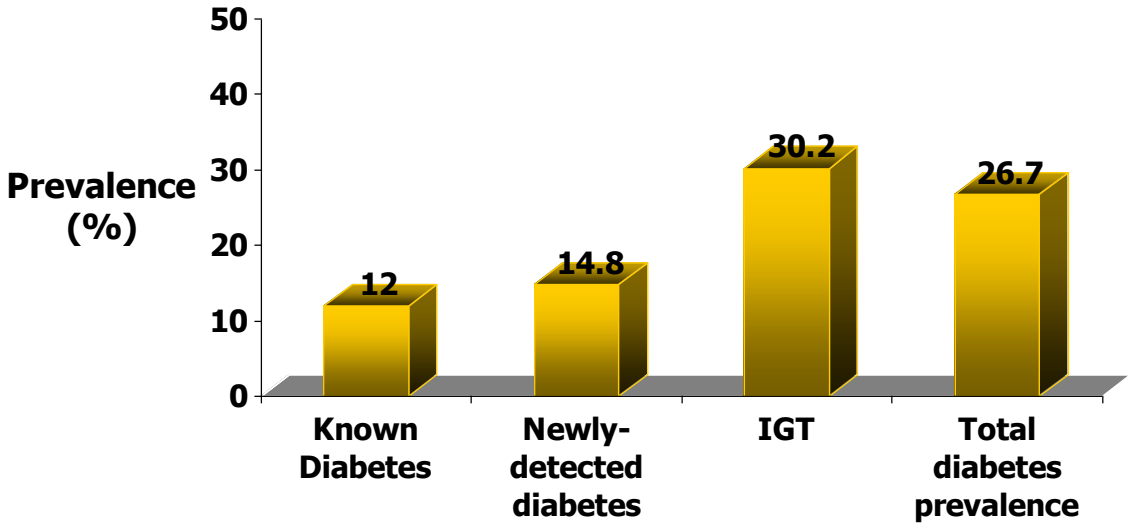
No specialist follow-up

(Reviewed by Sinclair AJ, Aspray TJ, 2009, Diabetes in Old Age – 3rd edition)

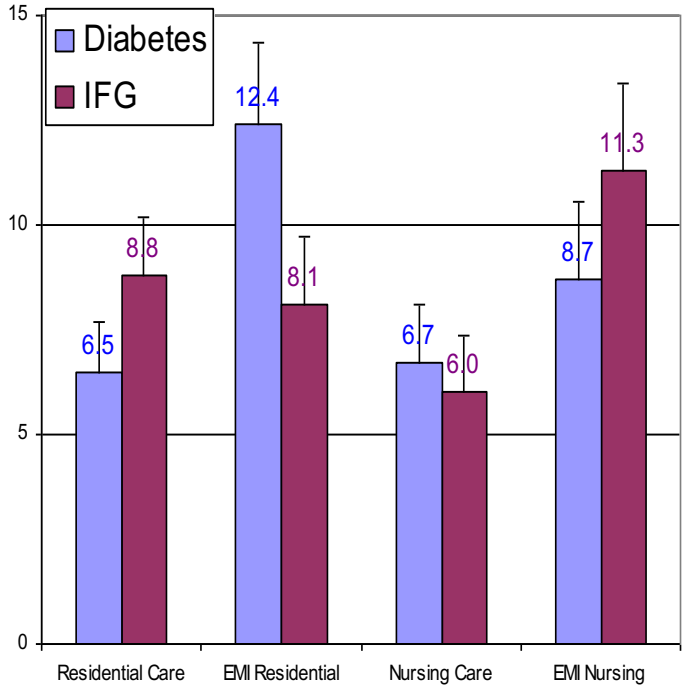
Diabetes is an independent risk factor for admission into a care home

High hospital admission rate with associated high mortality

The Birmingham Study 2001



The Newcastle Study 2006



Covid-19 and Diabetes in Older People

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Commentary

Age, frailty and diabetes – triple jeopardy for vulnerability to COVID-19 infection

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[b] Department of Geriatric Medicine, Rotherham General Hospital, Moorgate Road, Rotherham S60 2UD, United Kingdom

- Old age, frailty and diabetes are all inter-related and all are risk factors for mortality in covid-19 (a coronavirus disease)
- Frailty worsens prognosis in any severe illness
- Ageing immune system is associated with a low grade and chronic inflammatory state (InflammAgeing) marked by raised inflammatory markers such as IL-6 and C-reactive protein – this creates an exaggerated susceptibility to infection
- Patients infected with covid admitted to ITUs are more likely to have diabetes
- Diabetes is associated with immune dysfunction (impaired macrophage and lymphocyte function) and speeds progression to organ failure and septic shock in severe infections

UK and European Responses to Covid-19 in Care Homes

Diabet Med. 2020 May 5 : 10.1111/dme.14317.
doi: 10.1111/dme.14317 [Epub ahead of print]
PMCID: PMC7267536
PMID: 32369634

Guidelines for the management of diabetes in care homes during the Covid-19 pandemic

Alan Sinclair,[1] Ketan Dhatariya,[2] Olivia Burr,[3] Dinesh Nagi,[4] Kath Higgins,[5] David Hopkins,[3] Mayank Patel,[6] Partha Kar,[7] Catherine Gooday,[2] Dan Howarth,[3] Ahmed Abdelhafiz,[8] Philip Newland-Jones,[6] and Simon O'Neill[3]

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Abstract

The National Diabetes Stakeholders Covid-19 Response Group was formed in early April 2020 as a rapid action by the Joint British Diabetes Societies for Inpatient Care, Diabetes UK, the Association of British Clinical Diabetologists, and Diabetes Frail to address and support the special needs of residents with diabetes in UK care homes during Covid-19. It was becoming obvious that the care home sector was becoming a second wave of Covid-19 infection and that those with diabetes residing in care homes were at increased risk not only of susceptibility to infection but also to poorer outcomes. Its key purposes included minimising the morbidity and mortality associated with Covid-19 and assisting care staff to identify those residents with diabetes at highest risk of Covid-19 infection. The guidance was particularly created for care home managers, other care home staff, and specialist and non-specialist community nursing teams. The guidance covers the management of hyperglycaemia by discussion of various clinical scenarios that could arise, the management of hypoglycaemia, foot care and end of life care. In addition, it outlines the conditions where hospital admission is required. The guidance should be regarded as interim and will be updated as further medical and scientific evidence becomes available.

Keywords: Diabetes, care homes, Covid-19, residents, frailty, insulin

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Aging Clin Exp Res. 2021; 33(4): 895–900.
Published online 2021 Apr 15. doi: 10.1007/s40520-021-01822-1
PMCID: PMC8046642
PMID: 33856663

Dexamethasone and oxygen therapy in care home residents with diabetes: a management guide and algorithm for treatment: a rapid response action statement from the European Diabetes Working Party for Older People (EDWPOP) and European Geriatric Medicine Society (EuGMS)

Alan James Sinclair,[1,2] Stefania Maggi,[3,4] Ahmed Hassan Abdelhafiz,[2,5] Nicola Veronese,[4,6] Leocadio Rodriguez-Manas,[2,7] and Isabelle Bourdel-Marchasson[4,8]

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Abstract

Go to:

This statement addresses the need to provide clinically relevant and practical guidance for long-term care staff working in care homes and other stakeholders engaged in the care of residents who require consideration for dexamethasone and oxygen therapy. It had been provided following a series of consensus discussions between the EDWPOP and the EuGMS in January and February 2021. Its main aim is to minimise morbidity and mortality from serious acute illnesses including COVID-19 requiring these treatments within the long-term care sector.

Keywords: Long-term care, Diabetes, Oxygen, Dexamethasone, COVID-19

Dexamethasone-Oxygen delivery algorithm[30]

Figure 1: Algorithm for Oxygen and Dexamethasone Therapy in Long-term Care (LTC)

- Resident with respiratory failure (e.g. COVID-19) requiring oxygen therapy for continued hypoxaemia
- Oxygen saturation <92% (COPD <88% by pulse oximeter)

- Requires oxygen to prevent continued hypoxaemia
- Significantly poor outlook without further treatment

Admission into hospital?

YES
- Shared medical decision with resident/family and local clinicians
- Unstable resident with moderate to severe respiratory failure
- LTC/care home unable to provide managed support
- Not equipped to deliver oxygen
- Availability at hospital ITU or critical care unit

NO
- Resident/family wishes to remain in LTC / care home setting after discussion with local clinicians
- Resident stable with mild to moderate respiratory failure
- Limited availability at local hospital ITU or critical care unit
- Agreement by LTC facility manager/owner

Suitable for oxygen therapy?

NO
- Following local clinician/specialist review
- Provision of oxygen to LTC problematic
- No resources/staff availability with skills/experience to deliver oxygen therapy
- Resident unable to comply with oxygen therapy

YES
- Potential clinical benefit outweighs risks
- Resident/family agree to accept oxygen therapy
- Community support for oxygen therapy delivery available
- LTC staff have knowledge/training to provide /monitor oxygen therapy

Start Dexamethasone?
6mg once daily orally (2mg tabs) or via nasogastric route (15ml of 2mg/5ml solution) for 10 days

NO
- Unfavourable Risk-Benefit Ratio
- Resident/family decision not to take dexamethasone

YES
- Clinical decision based on favourable Risk-Benefit Ratio
- Resident/family agree to take dexamethasone
- No major other contraindications to taking dexamethasone
- Care staff able to carry out twice-daily glucose measurements as a minimum

4

Stakeholder and Advisory Representatives

NAPCHD

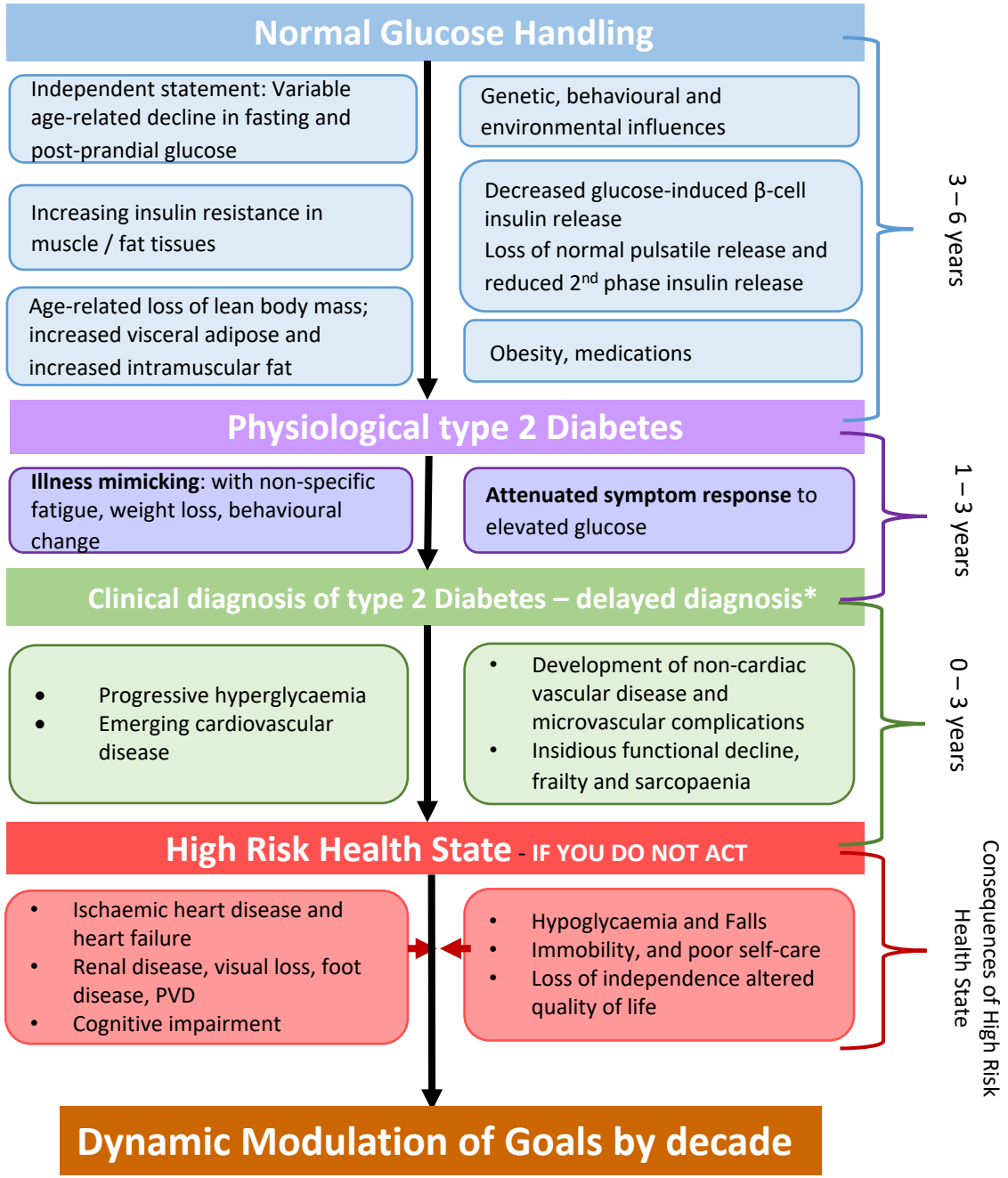
National Advisory Panel on Care Home Diabetes

Representative Bodies of the NAPCHD

Available at: http://fdrop.net/napchd

How should we describe type 2 diabetes in older adults ?

Diabetes in Older Adults – a Complex Illness Model



Template for Dynamic Modulation of Goals by decade

Factors influencing Goals:

- Comorbid state and functional level
- Onset of Frailty and/or dementia
- Renal impairment and risk of hypoglycaemia
- Ability to self-administer insulin
- Carer and Social Support
- Life expectancy

65–75y

- Normal active healthy lifestyle with regular exercise
- Focus on preventing functional decline
- Set Glucose and BP targets that minimise cardiovascular and microvascular risk

76–85y

- Maintain an appropriate healthy active lifestyle with frequent exercise
- Early detection of frailty and/or cognitive impairment and institute interventions where feasible
- Set glycaemic targets that continue to modify vascular risk but lower hypoglycaemia
- Set BP targets that maximise vascular outcome and minimise adverse events
- De-intensify medication where feasible

>85y

- Use glucose-dependent strategies to lower HbA1c levels
- Manage frailty and high comorbidity levels actively
- Institute a 'de-intensification' programme
- Minimise hypoglycaemia

Sinclair AJ, Abdelhafiz A, Forbes A, Munshi M, Diabetic Med 2018

An age-related disease in older people where many clinical failures can be prevented?

Diagnosis of Diabetes	• **Delayed diagnosis**
Onset of complications	• **Late detection: particularly eye disease/peripheral nerve damage due to lack of screening/foot disease**
Hypoglycaemia	• **Lack of recognition; use of inappropriate treatment or overtreatment**
Frailty and dementia	• **Lack of recognition plus/minus failure to examine and diagnose**
Care home residents with diabetes	• **Lack of individualized care plans: hypoglycaemia, recurrent infections, inadequate nutrition, pressure sores, lack of monitoring; lack of training and education of care**

Mortality (*hazard ratio-adjusted*) in Older People with Diabetes (DM) with non-DM as reference
Forbes A, Murrells T, Sinclair AJ, 2016

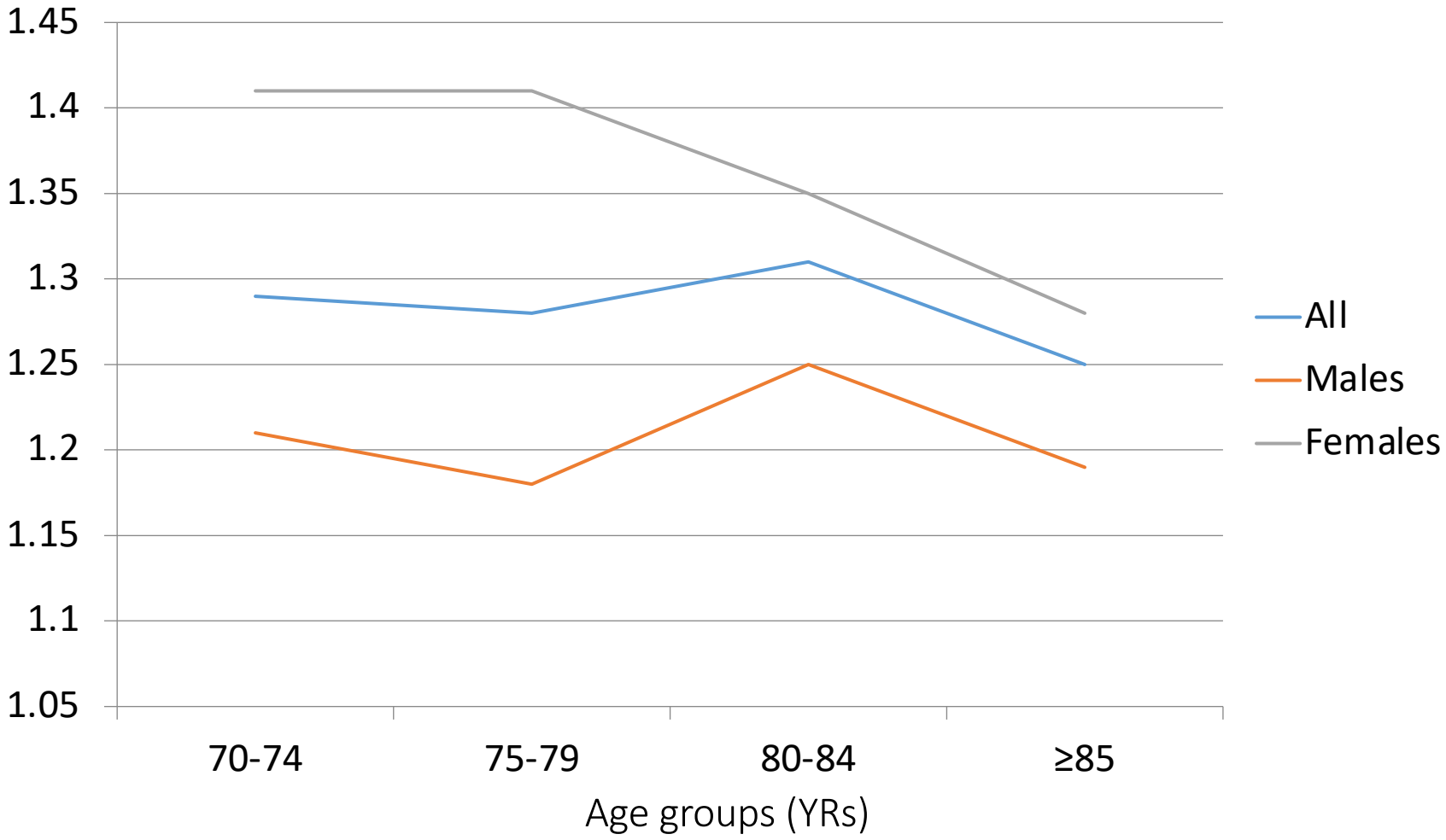
Overall excess mortality risk:

All = 29%

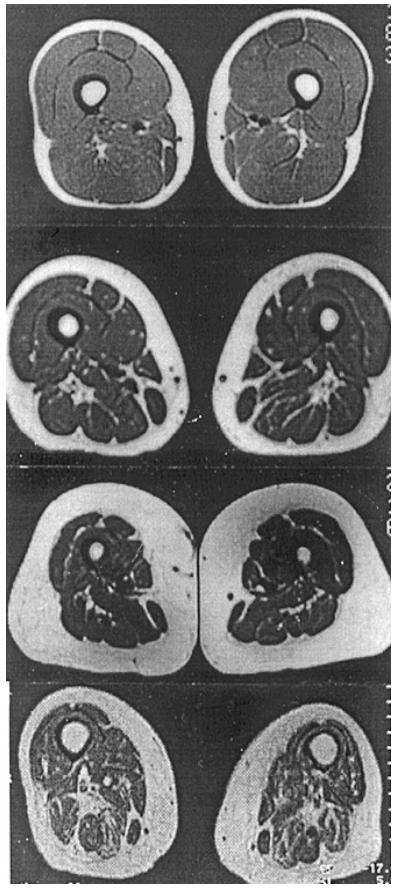
Males = 21%

Females = 36%

The Health Improvement Network (THIN) database: 464 UK general practices: electronic medical records: > 3 million records



Age-related loss of muscle mass - sarcopaenia



31 yrs (M)

66 yrs (M)

73 yrs (F

85 yrs (M

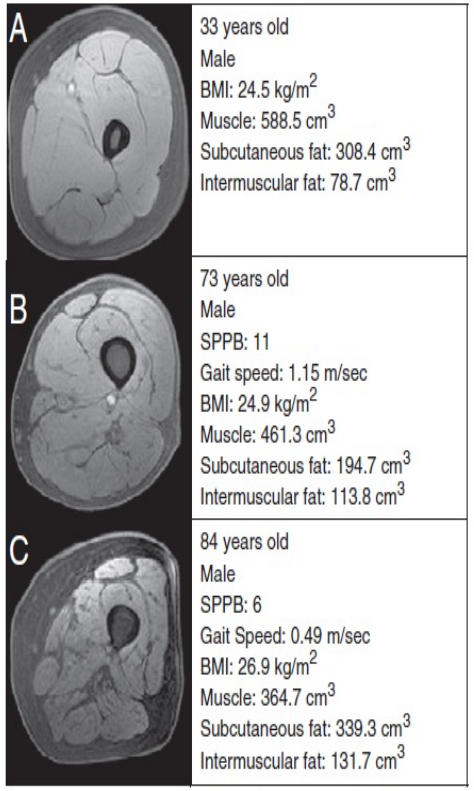


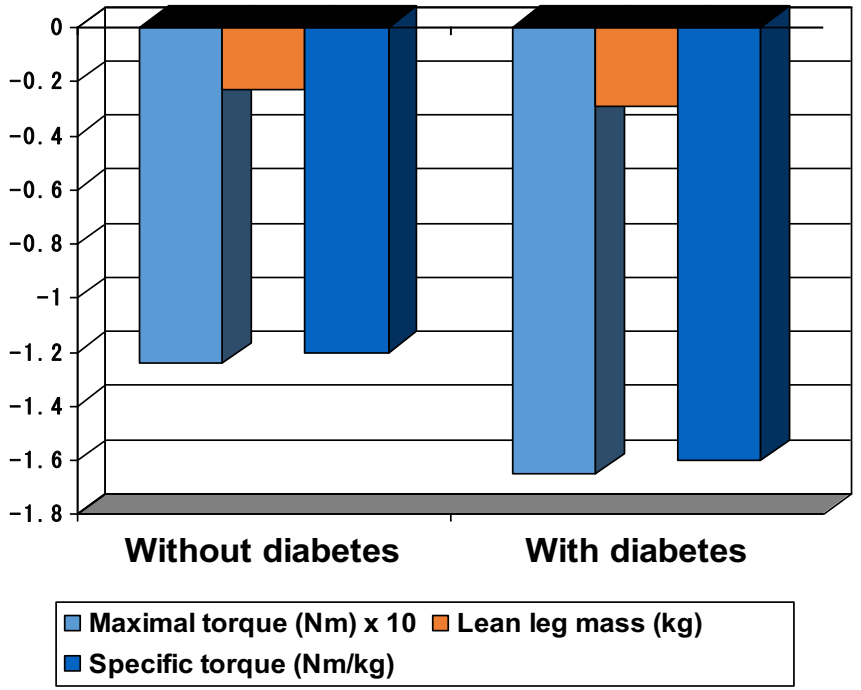
Fig. 1. Representative magnetic resonance images of the femoral region collected at 3T from A) young B) high-functioning older, and C) low-functioning older study groups.

Vandervoort
Muscle and Nerve 25, 2002)

Buford et al,
Exp. Gerontol, 2012

Diabetes-related accelerated loss of muscle and strength – Park SW et al, Ageing, & Body Composition (ABC) Study 2007

Knee extensor



1,840 older adults aged 70-79 years measured at baseline and 3 years

Diabetes as a Risk Factor for Dementia and Mild Cognitive Impairment: A Meta-analysis of Longitudinal Studies

G. Cheng et al 2012

- Quantitative meta-analysis of 19 studies from 1996–Dec 2010
- Data from 6184 subjects with diabetes and 38 530 subjects without diabetes
- Main finding – *diabetes was a risk factor for incident dementia (incl AD, VD and any dementia) and MCI*

Table 3 Summary relative risks of AD, VD and any dementia among subjects with diabetes compared with that without

	Heterogeneity test			Random effects		Fixed effects	
	Chi	d.f.	*P*	RR	95%CI	RR	95%CI
Risk for AD	47.3	15	<0.0001	1.46	1.20–1.77	1.54	1.40–1.70
Risk for VD	6.3	9	0.71	2.49	2.09–2.97	2.48	2.08–2.96
Risk for any dementia	28.9	10	0.001	1.51	1.31–1.74	1.54	1.41–1.67
Risk for mild cognitive impairment	0.1	1	0.76	1.22	1.0–1.45	1.21	1.02–1.45

95%CI, 95% confidence interval; AD, Alzheimer's disease; RR, relative risk; VD, vascular dementia.

The Mini–Cog Assessment Tool: development of a reliable and quick measure of mental performance in diabetes

Part A: **a three item recall**

Part B:

- Quick and easy to administer
- Participants given a circle (4-10cm in diameter), told that it represents a clock face and instructed to "put in the numbers so that it looks like a clock and the set the time to 10 minutes past 10"

- **Tests executive function and**
  - Auditory comprehension
  - Planning
  - Visual memory and reconstruction
  - Visuo-spatial abilities
  - Motor programming and execution
  - Numerical knowledge
  - Abstract thinking (semantic instruction)
  - Concentration

Part C – asked to repeat the original three items

Mini-Cog scores	No. of patients		No. aged			
			55-64	65-74	75-84	85+
0	2 (1%)	**35 (17.4%) screen-positive**			2(3%)	
1	4 (2%)		1(2%)	1(1%)	2(3%)	
2	9 (4%)			4(6%)	5(7%)	
3	20 (10%)		2(4%)	8(12%)	9(12%)	1(11%)
4	30 (15%)		7(14%)	6(9%)	15(20%)	2(22%)
5	136 (68%)		39 (80%)	48 (72%)	43(57%)	6(66%)

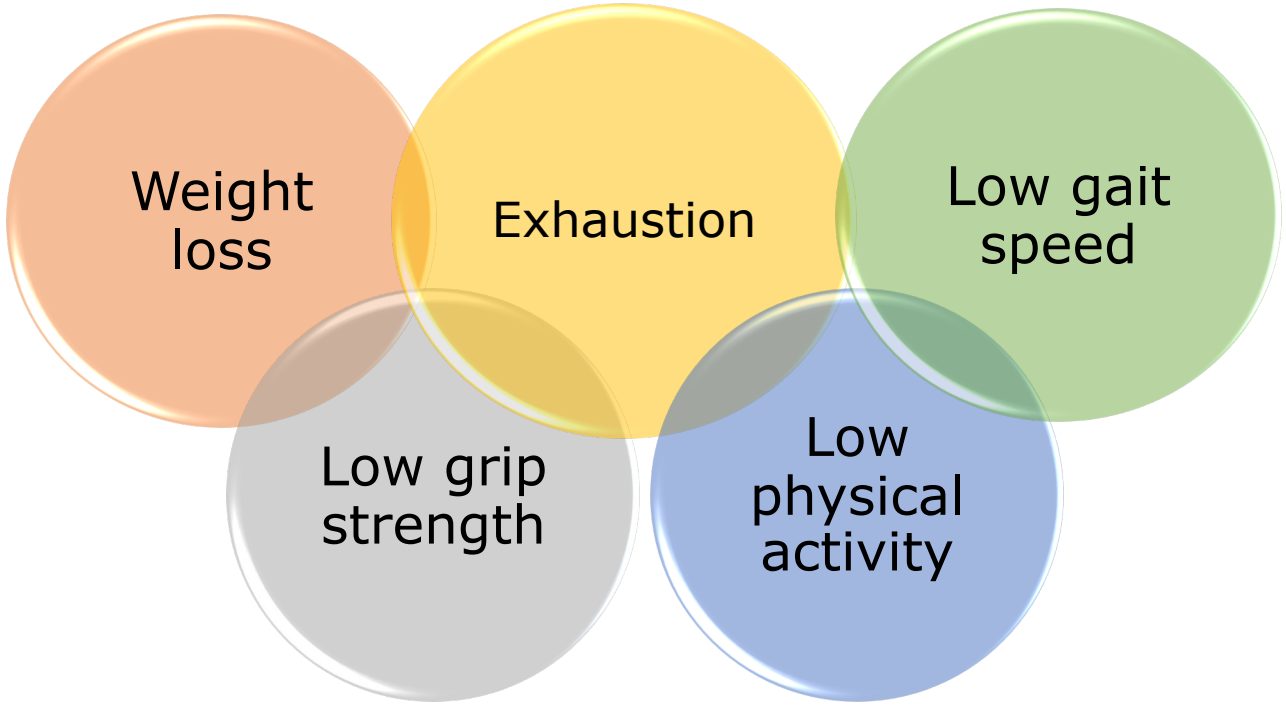
•PILOT study of 207 patients aged 55 – 90 years
•Use of Mini-Cog to screen for cognitive impairment in diabetes in primary care settings

•Use of score of <24 on MMSE, the Mini-Cog had sensitivity of 86%, specificity of 91%, positive predictive value of 54% and negative predictive value of 98%.

Not influenced by education, culture or language; Performance comparable to MMSE *Borson S. et al, 2000; Shulman, 2000*

Sinclair AJ, Gadsby R, Hillson R, Forbes A, Bayer AJ, 2013,

Emerging Concepts of Frailty – A multisystem impairment associated with increased vulnerability to stressors



FRIED Phenotypic Model (Fried L et al, 2001)

Score	
0–1	= Not frail
2	= Pre-frailty
3–5	= Frailty

Cumulative Deficit Model of Frailty: derivation of the Electronic Frailty Index *Rockwood K et al, 2007*

- The eFI consists of 36 deficits which have been constructed using around 2,000 primary care Read codes
- The eFI calculates a frailty score by dividing the number of deficits present by the total possible: uses 36 validated deficits
- The score is a robust predictor of those who are at greater risk of adverse outcomes: *an eFI > 0.36 have a six-fold increased risk of admission to a care home in the next 12 months and a five-fold increased mortality risk, compared to fit older people*

Clegg A et al, 2016

Prognostic Outcomes once Frailty is Diagnosed – results from the Cardiovascular Health Study, 2001 – most are preventable with good management

	Hazard ratios Estimated over 3 years
	Frail
Incident fall	1.29
Worsening mobility	1.50
Worsening ADL disability	1.98
First hospitalisations	1.29
Death	2.24

Cardiovascular Health Study data, 2001

FRAIL TEST – non-invasive frailty screening tool

Morley JE et al 2012

The clinician asks:

Fatigue: Are you fatigued?

Resistance: Are you unable to walk up one flight of stairs?

Aerobic: Are you unable to walk one block?(equivalent of about 200m)

Illnesses: Do you have more than 5 illnesses?

Loss of weight: Have you lost more than 5% of your weight in the past 6 months?

Interpretation: Answers yes to:

≥3: indicates frailty, 1-2: indicates pre-frailty.

Advantages of Test

- Simple, easy to learn
- Does not require a face to face consultation
- Utilises 4 components of the Cardiovascular Study Index (Fried Criteria) and 1 component from the Rockwood Clinical Frailty Scale
- Correlates well with IADL, gait speed and SPPB
- Valid in late middle age and older adults

Rosas-Carrasco O et al, 2010 (Mexicans);
Li Y et al 2015 (Chinese); Ravindrarajah R et al 2013 (Europeans)

Clinical Frailty Scale – *based on the Rockwood Model*

Clinical Frailty Scale*

1 **Very Fit** – People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.

2 **Well** – People who have **no active disease symptoms** but are less fit than category 1. Often, they exercise or are very **active occasionally**, e.g. seasonally.

3 **Managing Well** – People whose **medical problems are well controlled,** but are **not regularly active** beyond routine walking.

4 **Vulnerable** – While **not dependent** on others for daily help, often **symptoms limit activities.** A common complaint is being "slowed up", and/or being tired during the day.

5 **Mildly Frail** – These people often have **more evident slowing,** and need help in **high order IADLs** (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.

6 **Moderately Frail** – People need help with **all outside activities** and with **keeping house**. Inside, they often have problems with stairs and need **help with bathing** and might need minimal assistance (cuing, standby) with dressing.

7 **Severely Frail** – **Completely dependent for personal care**, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~ 6 months).

8 **Very Severely Frail** – Completely dependent, approaching the end of life. Typically, they could not recover even from a minor illness.

9. **Terminally Ill** - Approaching the end of life. This category applies to people with **a life expectancy <6 months**, who are **not otherwise evidently frail.**

Scoring frailty in people with dementia

The degree of frailty corresponds to the degree of dementia. Common **symptoms in mild dementia** include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal.

In **moderate dementia**, recent memory is very impaired, even though they seemingly can remember their past life events well. They can do personal care with prompting.

In **severe dementia**, they cannot do personal care without help.

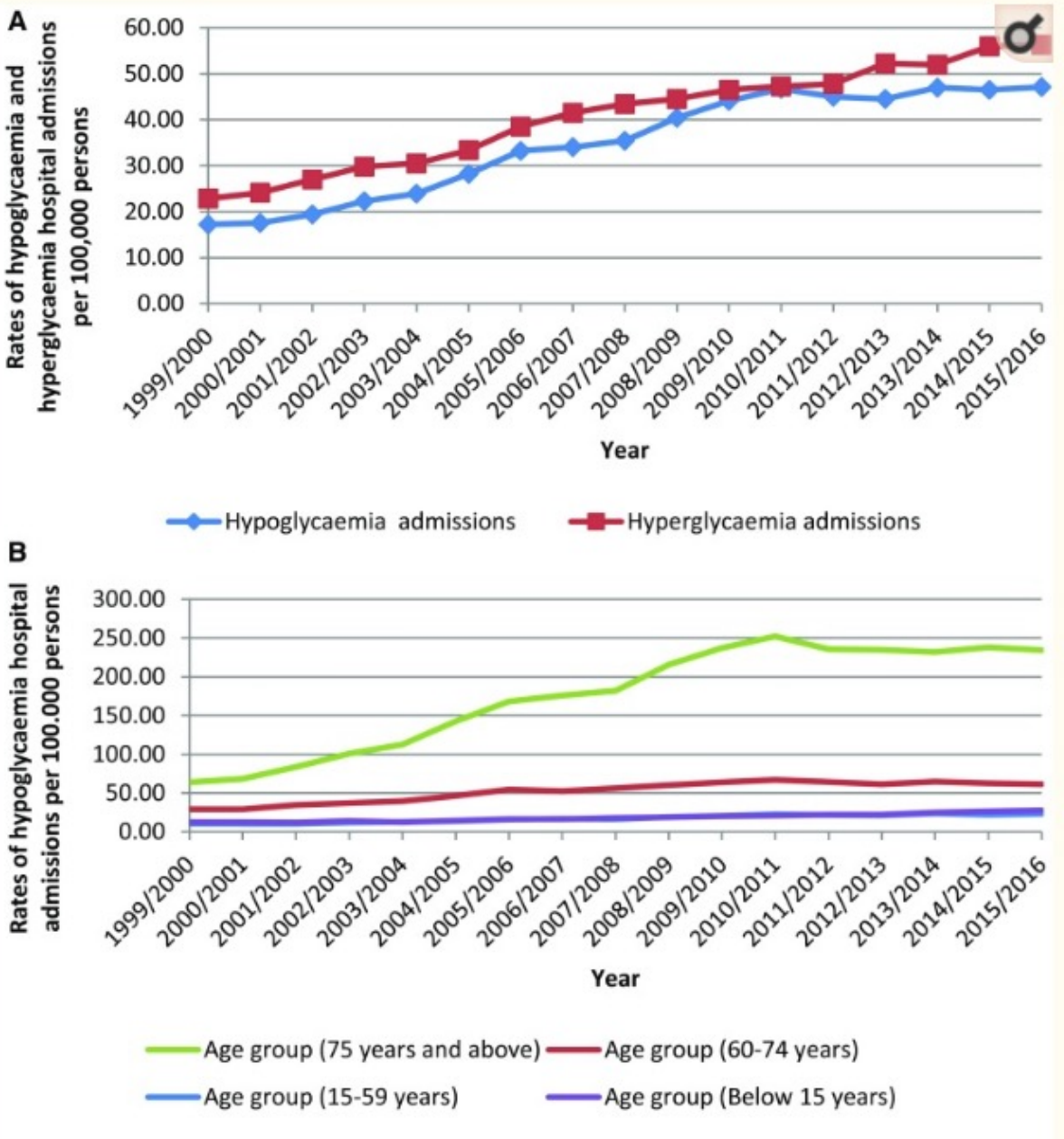
* 1. Canadian Study on Health & Aging, Revised 2008.
2. K. Rockwood et al. A global clinical measure of fitness and frailty in elderly people. CMAJ 2005;173:489-495.

DALHOUSIE UNIVERSITY *Inspiring Minds*

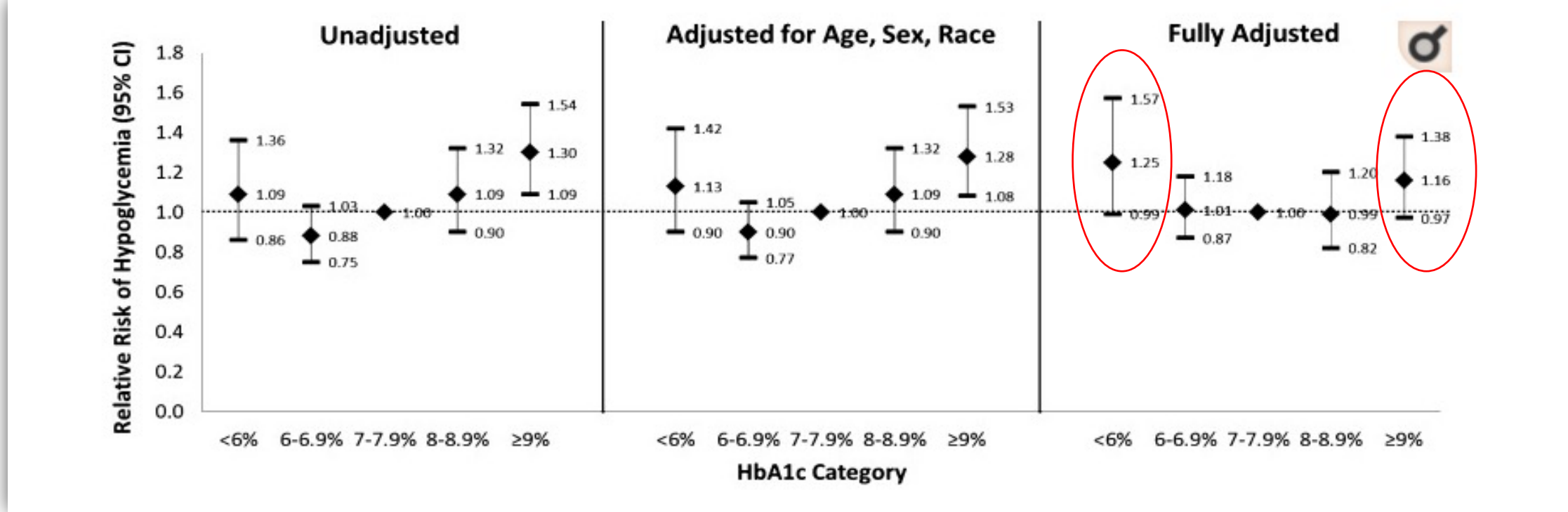
Hospital Admissions in England and Wales (1999-2016) for Dysglycaemia

Naser AY et al, Diab Ther 2018

- Observational study of all hospital admissions for hypoglycaemia and hyperglycaemia
- Hospital Episode Statistics database in England and the Patient Episode Database for Wales
- **173% increase in hypoglycaemia for the period**
- Strong relationship between hypoglycaemia and parallel increase in glucose-lowering medications



Hypoglycaemia does not only occur in 'tight control!
Data from the Diabetes and Aging Study *Lipska KJ et al, 2013*



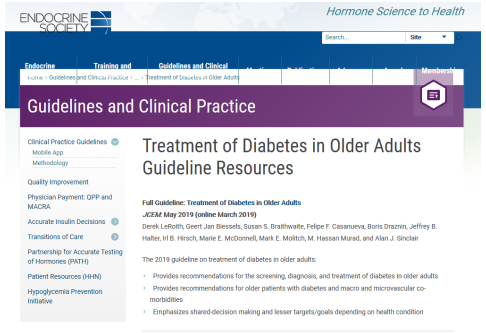
A survey of self-reported severe hypoglycaemia in the past year, n = 9094, aged 60+/-9.8 years; mean HbA1c 7.5% (59 mmol/mol) +/-1.5%.

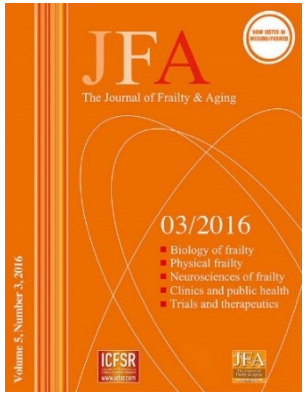
Results not altered by age, diabetes duration, or diabetes medication.

Can we manage type 2 diabetes using these perspectives?

Guidelines DO NOT answer some of the Key Questions in Management

International Guidelines





They DO NOT Answer:

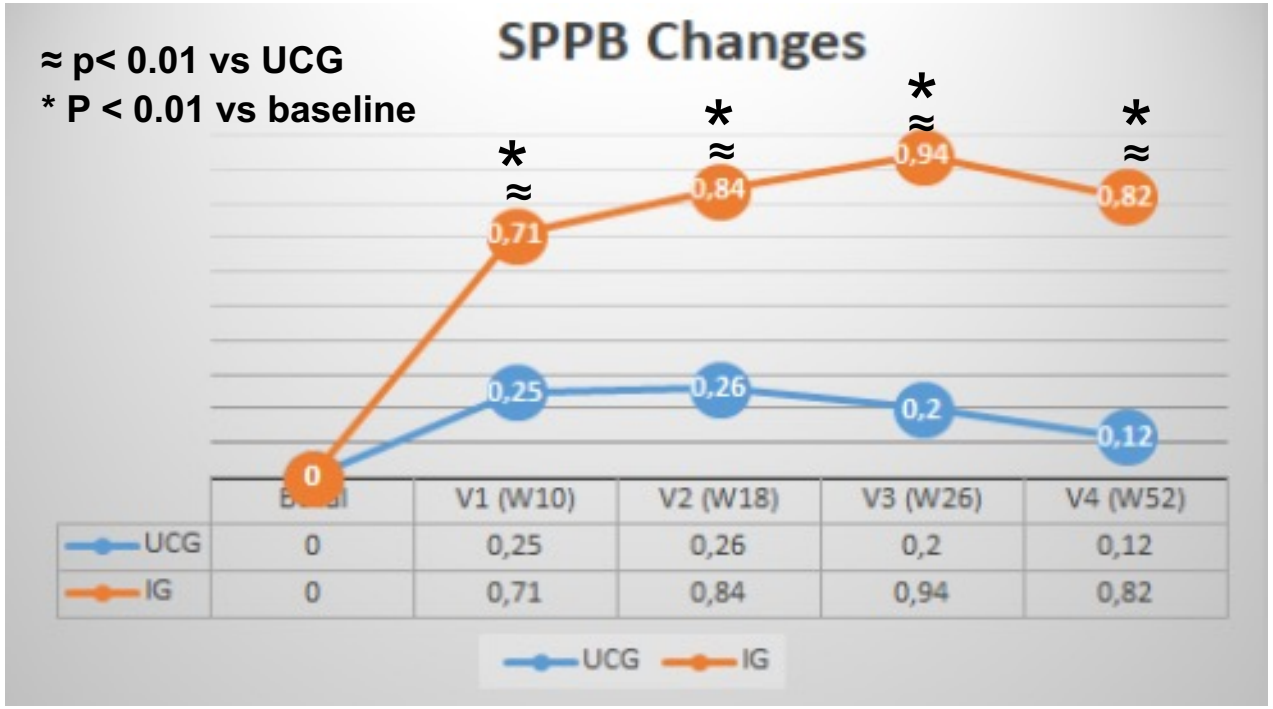
- What are the elements of a successful de-escalation approach to management?
- Why a different approach to managing comorbidity and/or frailty is necessary?
- Why a single gluco-centric approach in any case would suit all patient groups and needs of a complex illness model?
- How do we distinguish the various groups of older people with diabetes who are more likely to benefit from specific treatment approaches?
- Should we consider a more precision medicine approach?

Inherent Difficulties in Managing Older People with Diabetes

- **The need to consider the significant heterogeneity of an older population of people with diabetes – effects of ageing, changes in renal function, varied susceptibilities to hypoglycaemia, socioeconomic status - see image**
- **The need to consider the multimorbidity profile and its impact on management**
- **The need to assess the importance and impact of functional loss including frailty, disability and cognitive impairment in setting targets**
- The need to understand better why diabetes self-management can be a challenging prospect in older people
- The need to extrapolate clinical trial evidence from younger populations in the absence of data in older people
- The lack of evaluation in clinical guidelines that target older people with diabetes

EUROPEAN COMMISSION / European Research Area / Health & life sciences

Frailty in Diabetes is reversible



MID Frail

MAIN RESULTS at 1 YEAR

J Cachexia Sarcopenia Muscle. 2019 Apr 23.[Epub ahead of print]

Effectiveness of a multimodal intervention in functionally impaired older people with type 2 diabetes mellitus.

Rodriguez-Mañas L[1], Laosa O[2], Vellas B[3], Paolisso G[4], Topinkova E[5], Oliva-Moreno J[6], Bourdel-Marchasson I[7], Izquierdo M[8], Hood K[9], Zeyfang A[10], Gambassi G[11], Petrovic M[12], Hardman TC[13], Kelson MJ[14], Bautmans I[15], Abellan G[3], Barbieri M[4], Peña-Longobardo LM[6], Regueme SC[7], Calvani R[11], De Buyser S[12], Sinclair AJ[16]; European MID-Frail Consortium.

Co-morbid illness attenuates the expected benefits of intensive glucose control in older patients with type 2 diabetes

Huang ES 2008

- Use of decision analysis (multiple prediction models)
- Based on UKPDS, NIH [illegible]del, and Health and Retirem[illegible] Study data
- Simulation for pa[illegible] 40-80y with type 2 [illegible] using 5y ag[illegible]
- Compared the pro[illegible] health benefits [illegible] moderate control (HbA[illegible] 7.9%, 63 mmol/mol) w[illegible] intensive control (HbA1c 7%, 53 mmol/mol)

Similar findings in patients up to 15 years of diabetes duration

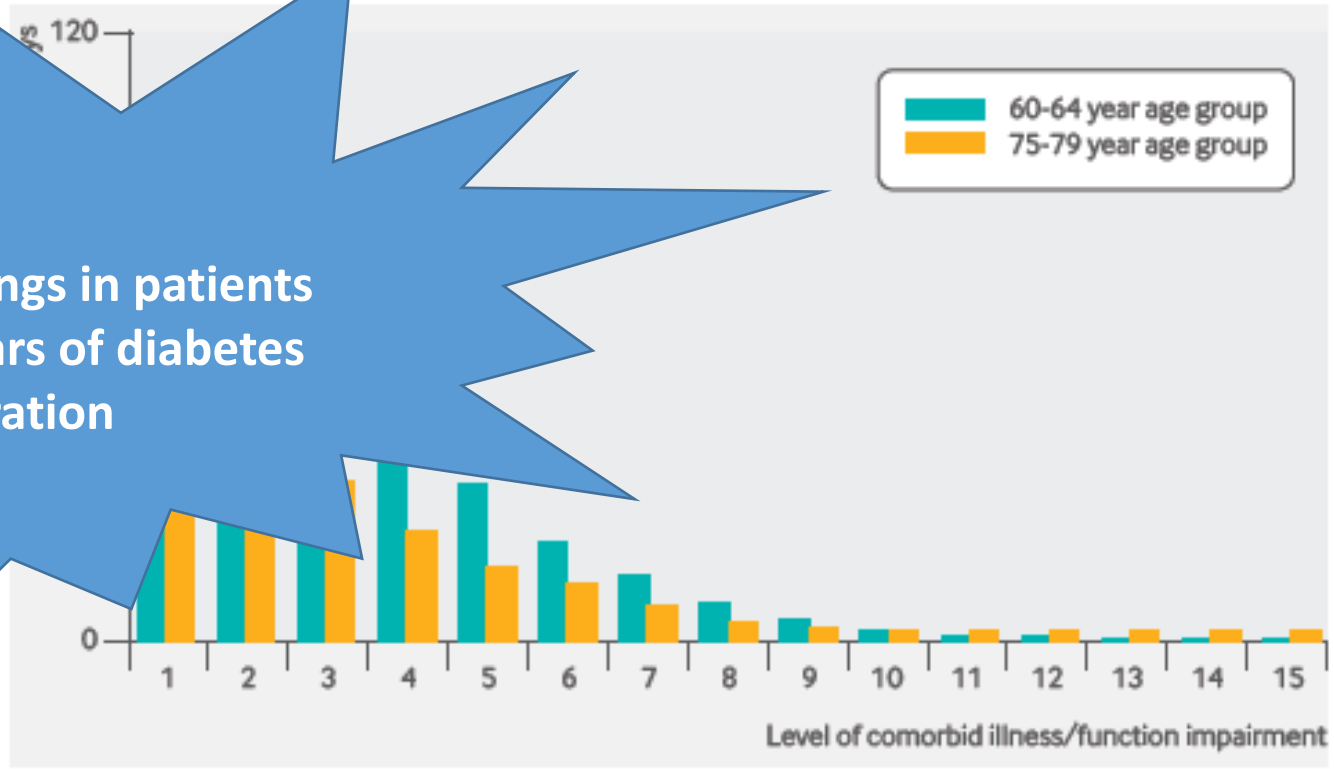
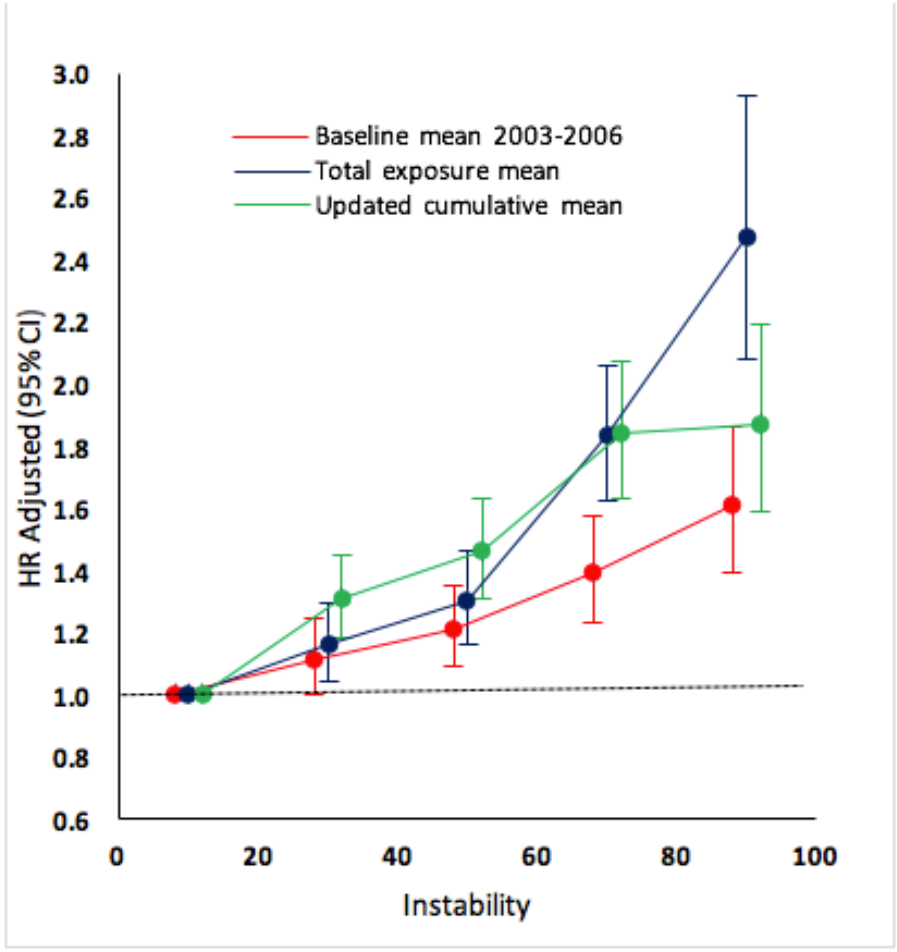


Fig 3 | Expected quality of life benefits of intensive glucose control for 60-64 year old and 75-79 year old patients with newly diagnosed diabetes, with increasing levels of comorbid illness and functional impairment[58]

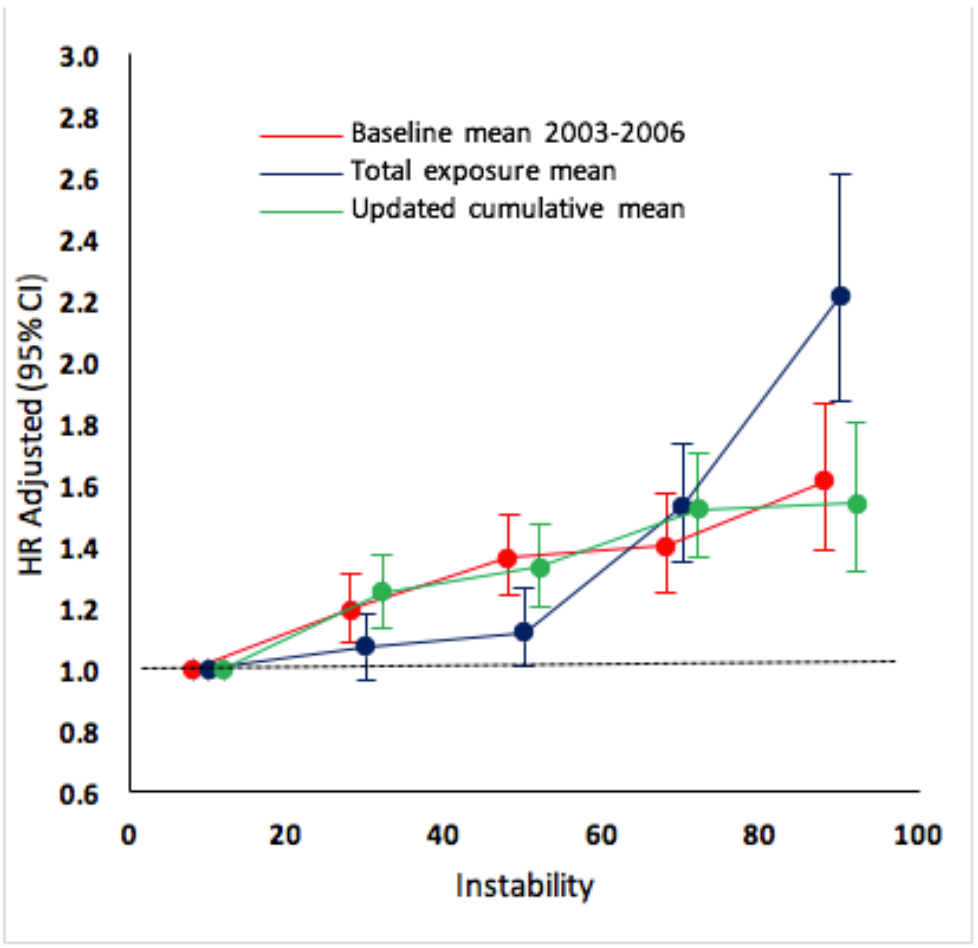
Adjusted HRs by HbA1c level for all-cause mortality in women (a) and men (b) – importance of a stable level of glycaemia. *Lancet D&E, 2018*

Error bars are 95% CIs. HR=hazard

a) Females, age 70 and over, duration of diabetes five years



b) Males, age 70 and over, duration of diabetes five years

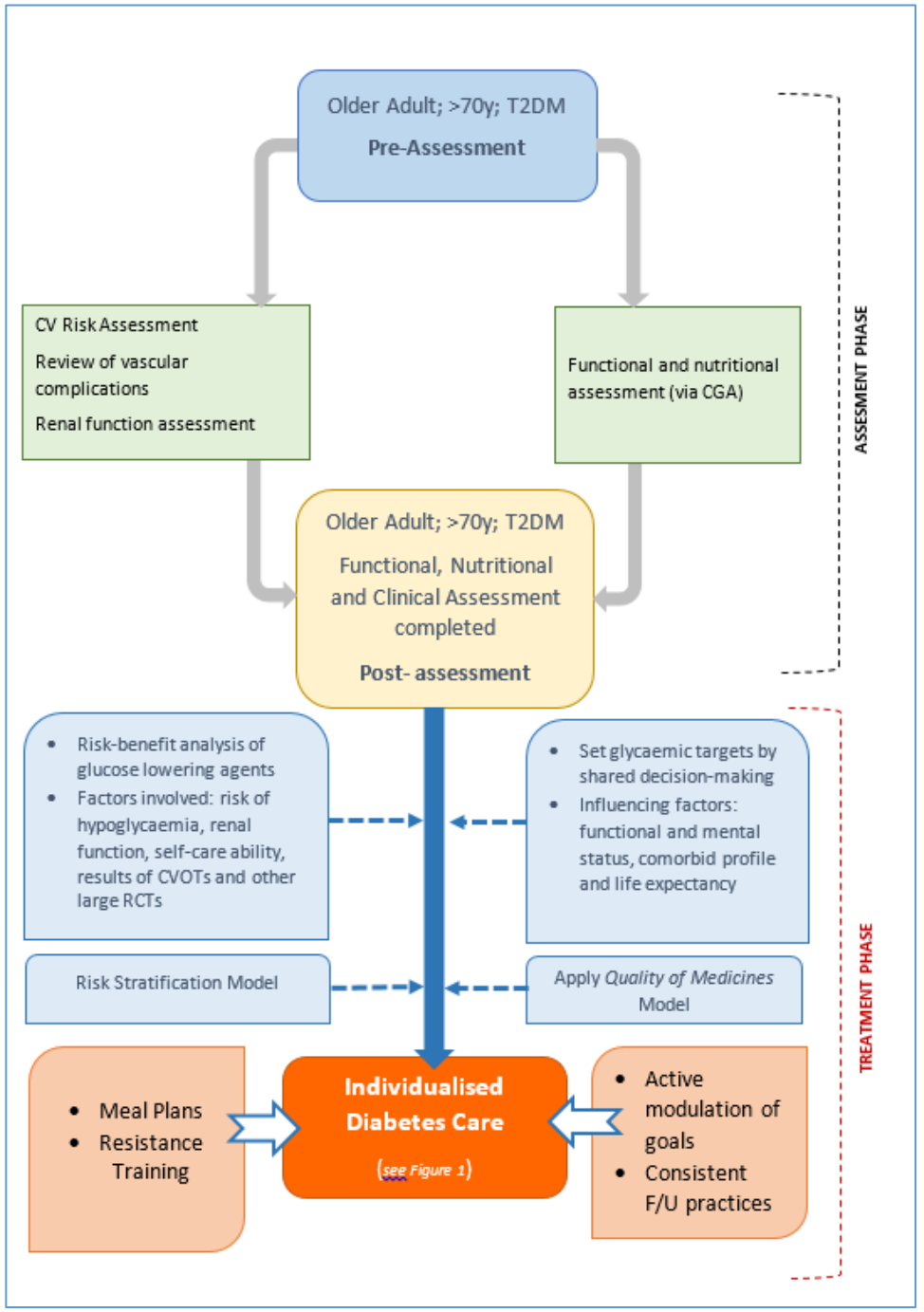


Forbes A, Murrels T, Sinclair AJ, Lancet D&E 2018

Working towards Individualised Care

Lancet paper

Sinclair AJ, Abdelhafiz A, Forbes A, Munshi M, Diabetic Medicine 2018



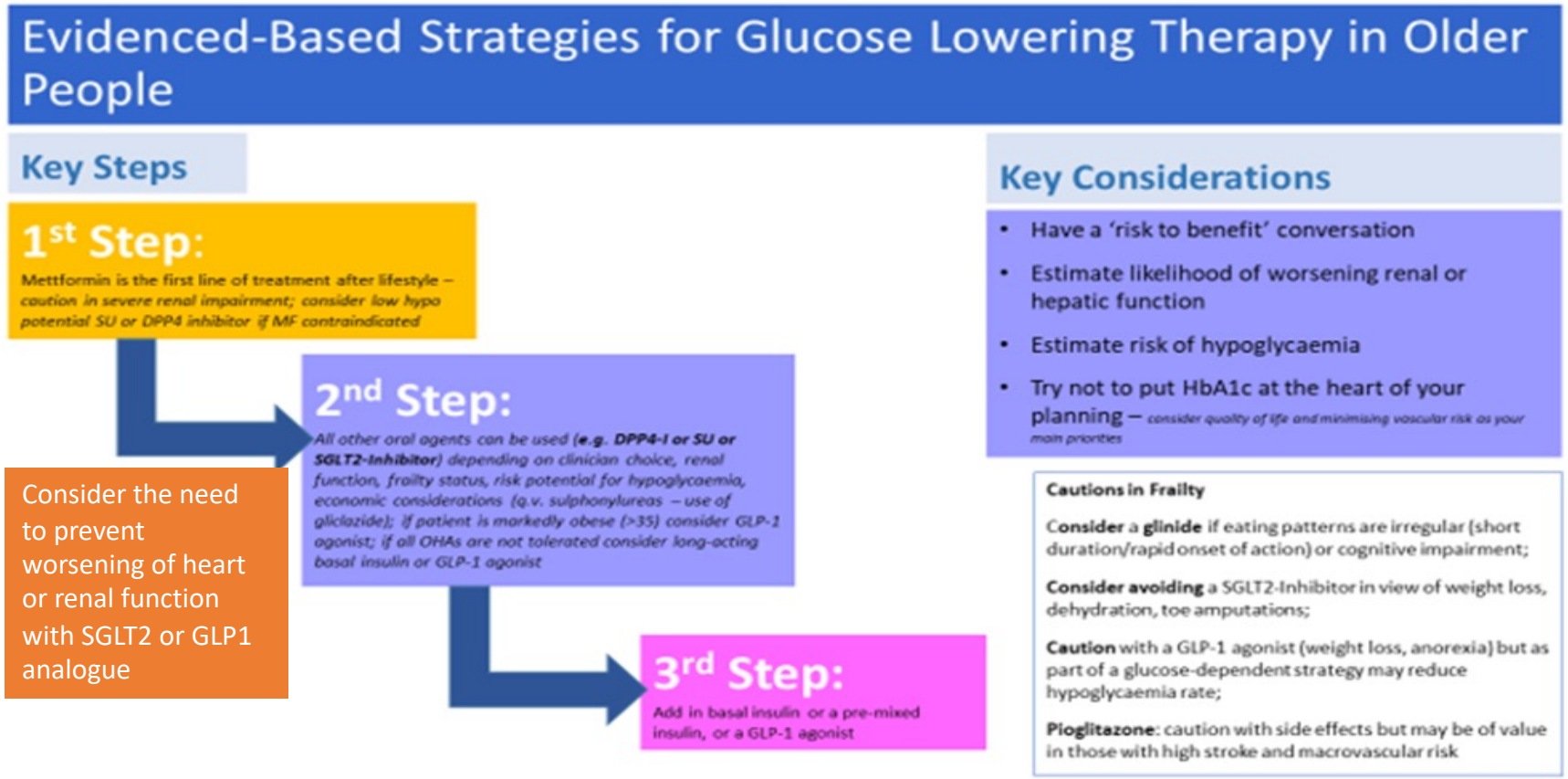
Newer Therapies - Results of Subgroup Analyses in Established CVD–Recent Cardiovascular Outcome Trials – but what do they tell us about older people?

Trial	Agent	Outcome	HR, 95% co nce interval		
			Age <6	Age ≥65-75Y	Age ≥75Y
EMPA-REG	Empagliflozin			58 to 0.93.	0.68, 0.46 to 1.00.
DECLARE-TIMI	Dapagliflozin				0.94, 0.65 to 1.36.
CANVAS	Canagliflozin			2 to 0.97.	NR
SGLT-2i meta-analysis	**SGLT-2i CV outcom trials**				**NR**
LEADER	Liraglutide	3P-M	97.	.79 to 1.02.	0.66, 0.49 to 0.89
SUSTAIN-6	Semaglutide	3P	0.74 .05.	0.7 1 to 1.02	NR
EXSCEL	Exenatide	3P-MACE	1.05, 0.92 1.21.	0.80, 0.71 to 0.91.	NR
GLP-1RA meta-	**GLP-1RA CV outcome**	**3P-MACE**	**0.89, 0.76 to 1.03.**	**0.86, 0.80 to 0.92.**	**NR**

- **Both SGLT-2i and GLP-1RA reduce 3P-MACE in younger (65Y) and older (≥65y) patients with type 2 diabetes.**
- **These agents are generally well-tolerated in older people with less risk of hypoglycaemia.**
- **Older (>75Y) people are less represented in these trials, therefore generalisation of findings is limited by under reporting in this age group.**

Glucose lowering treatment

(a) A scheme for treating older adults with type 2 diabetes using a 3-step approach *



EDWPOP
European Diabetes Working Party for Older People

EuGMS
European Geriatric Medicine Society
Fostering geriatric medicine across Europe

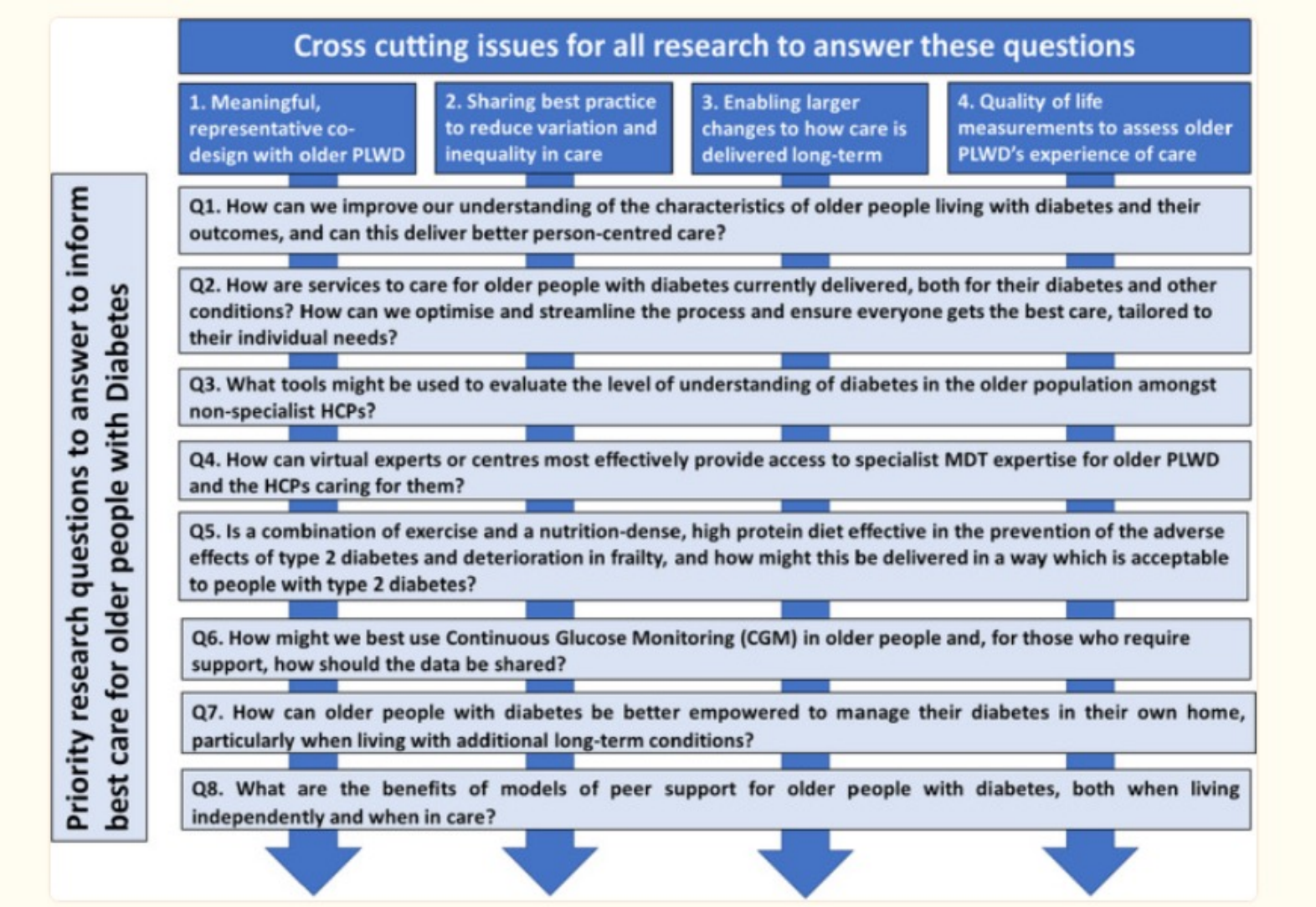
Individualised Metabolic Targets for Older People – EDWPOP, IDF, AES and ADA Guidelines

Target	EDWPOP (2011)		IDF (2013)		AES (2019)		ADA (2022)	
	Patient group	Target	Patient group	Target	Patient group	Target	Patient group	Target
HbA1c mmol/mol (%)	Non-frail	53-59 (7.0-7.5%)	Functionally independent	53-59 (7.0-7.5%)	Good health	< 58 mmol/mol (7.5%)	Functionally independent	A1C <7.0–7.5% (53-58 mmol/mol)
			Functionally dependent	53-64 (7.0-8.0%)	Intermediate health	<64 - ≥58 mmol/mol <8.0% and ≥7.5%)		
	Frail	60-69 (7.6-8.5%)	Frail	<69 (<8.5%)	Poor health	<69 and ≥64 mmol/mol (<8.5% and ≥8.0%)	Highly comorbid/dependent	A1C < 8.0% (64 mmol/mol)
BP, mmHg	Non –frail	<140/80	Functionally independent	<140/90	All aged ≥65 - ≤85 y	140/90	Most Older Adults	<140/90
	Frail	<150/90	Frail	<150/90				
LDL-cholesterol mmol/l	All older adults	Statins unless contraindicated		<2.0	All aged 65 y or older	Statins unless contraindicated	All older adults	Statins – moderate to intense therapy depending

Ageing well with diabetes: A workshop to co-design research recommendations for improving the diabetes care of older people.
A Diabetes UK initiative (2021). *Wylie TAF et al*

Diabetes UK

The charity for people with diabetes

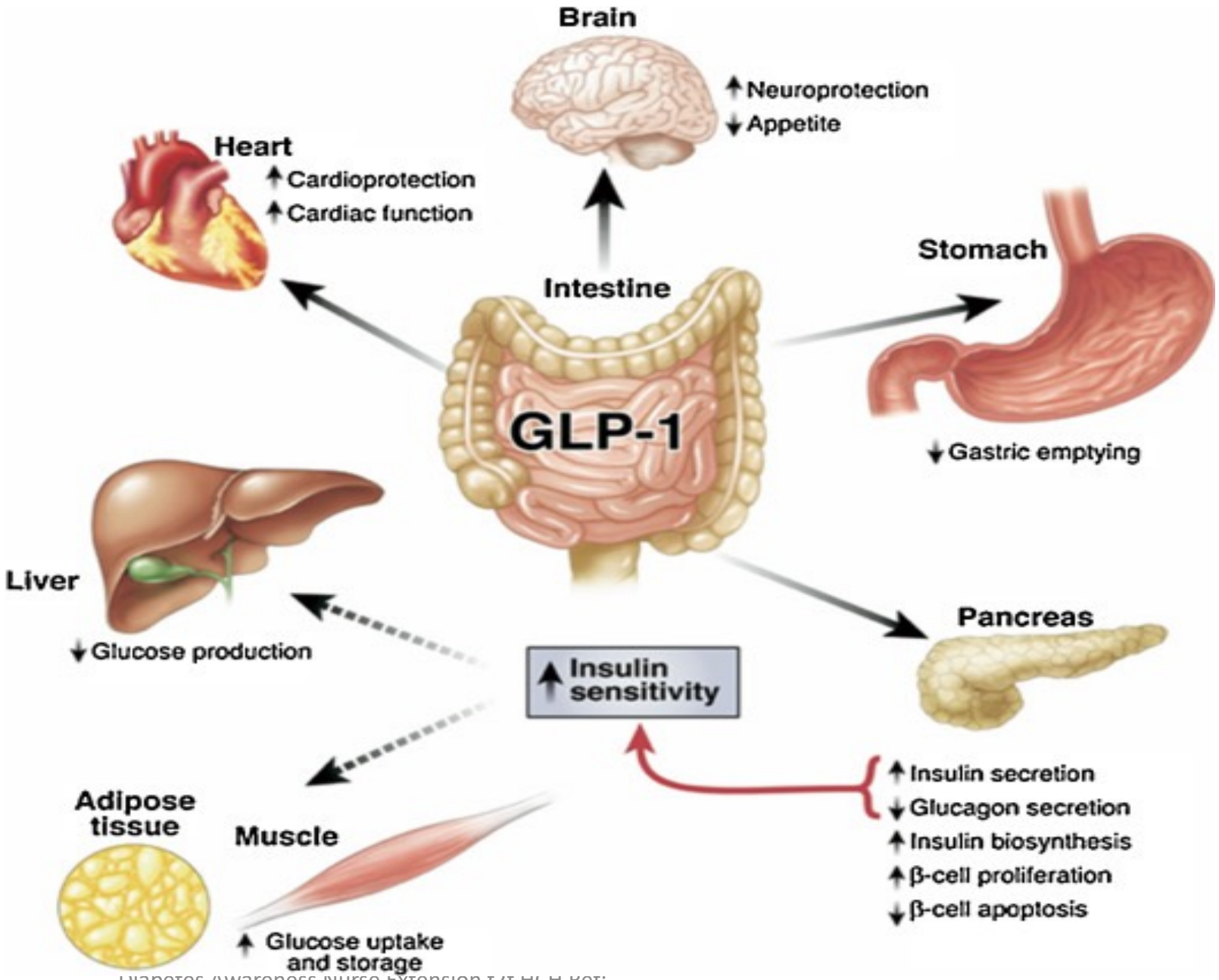


Conclusions

- Diabetes in older people can OFTEN BE MANAGED SUCCESSFULLY with an individualized management approach
- However, the wide heterogeneity of this condition requires an assessment of key problems that arise to limit effective target setting
- An appreciation of both frailty and other comorbidities is a primary requisite to successful care in diabetes

Foundation for Diabetes Research in Older People

How does GLP-1 work?



How is an injectable GLP-1 agonist given?

- Pen devices are used
- GLP 1 agonists are given as a fixed dose – no titration
- Usually a low dose is given for the first 1 – 2 weeks
- Then a standard dose is given as ongoing therapy
- Can be given with most OGLTs – DPP4s will be stopped
- Can be given once/twice daily or weekly

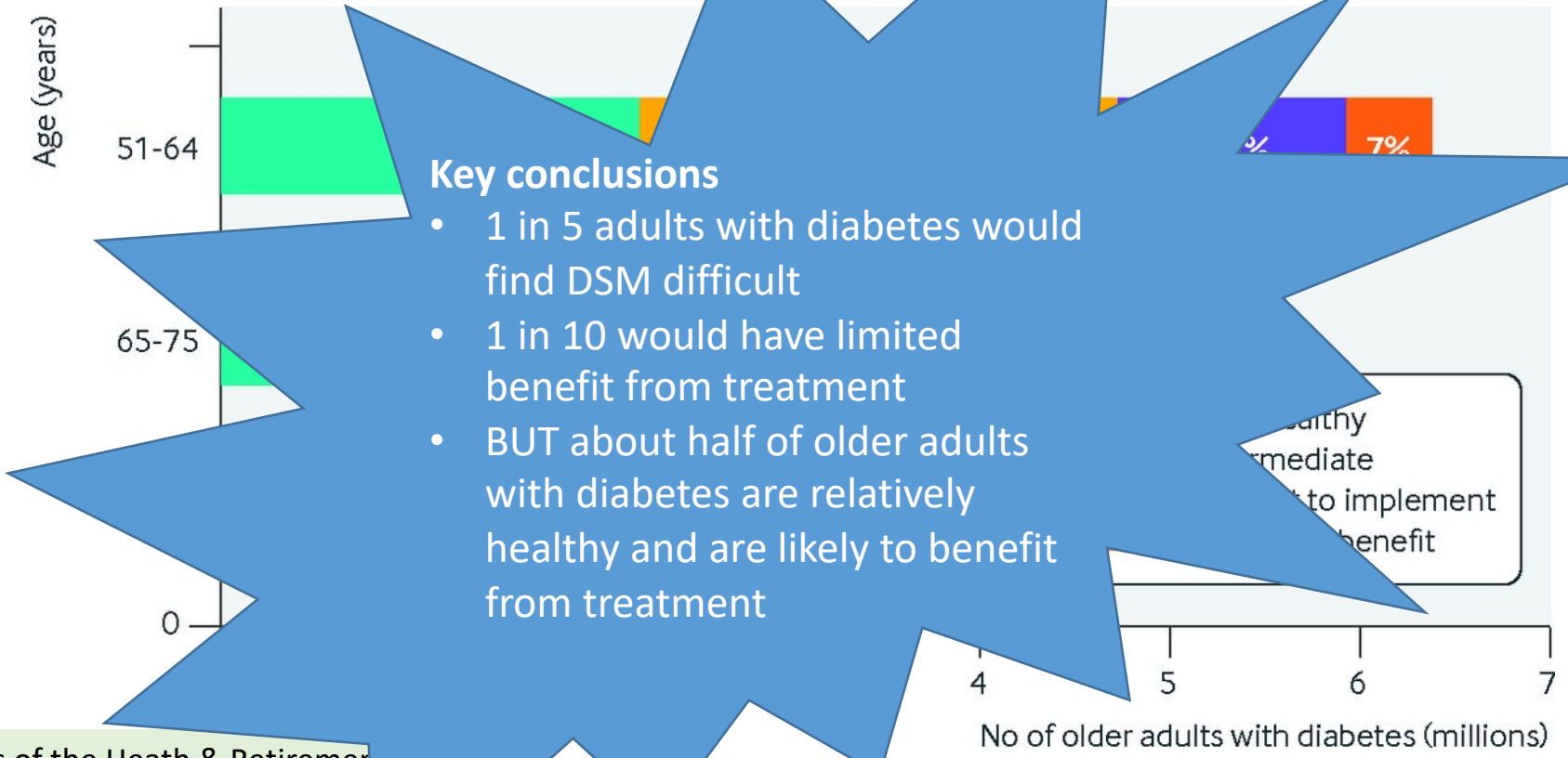
Frequencies of adults with diabetes in clinical groups by age in United States Health and Retirement Study.

Blaum C et al, 2010

Class 1: relatively healthy – little or no comorbidties

Class 2: complex illness profile where self-care may be difficult

Class 3: significant multimorbidity profile/functional impairment



Key conclusions

- 1 in 5 adults with diabetes would find DSM difficult
- 1 in 10 would have limited benefit from treatment
- BUT about half of older adults with diabetes are relatively healthy and are likely to benefit from treatment

Secondary data analysis of the Heath & Retiremer
interview – 3506 (≥ 51y) with diabetes and 1132 a
(mail shot); clinical grouping by clinical insight and
literature

Overtreatment of hyperglycemia in older people, *Lipska KJ et al, 2015*

Figure 1. Achieved Glycemic Control Among Older US Adults With Diabetes Mellitus Across 3 Health Status Categories

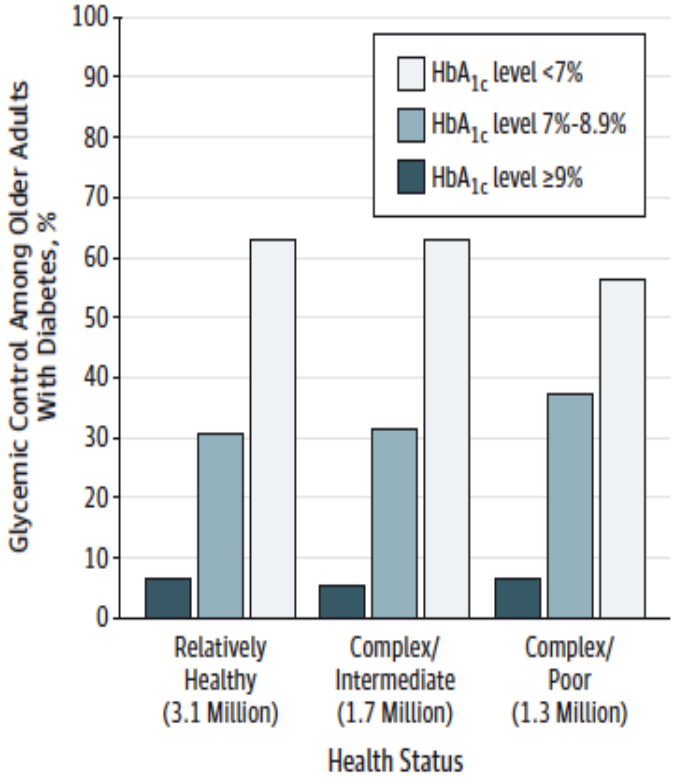
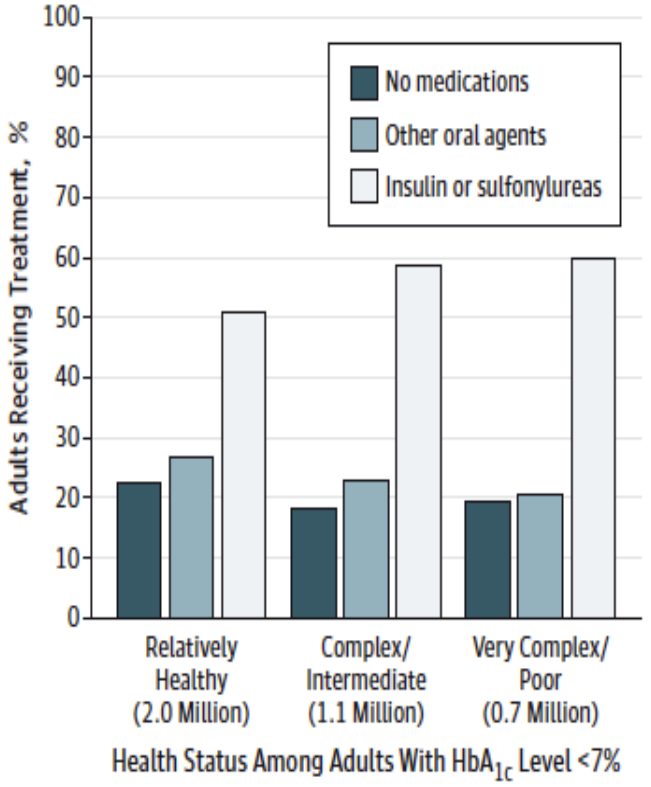
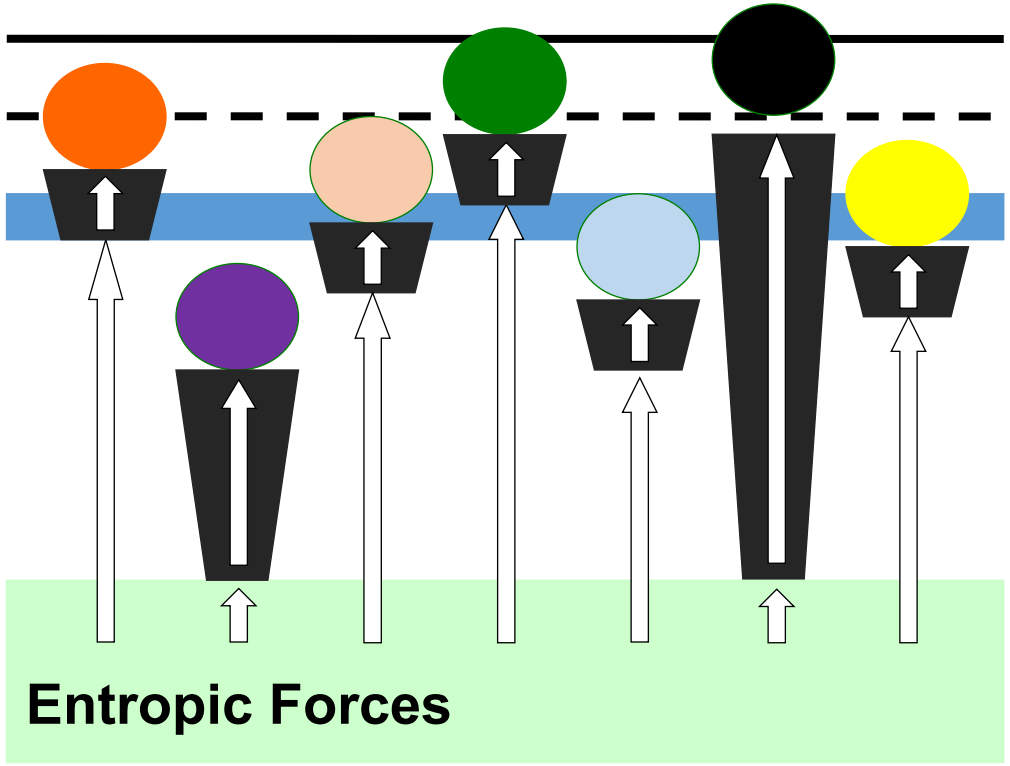


Figure 2. Treatment of Older US Adults With Diabetes Mellitus With an HbA_{1c} Level of Less Than 7% Across Health Status Categories



Age-related Model of Disease and Function



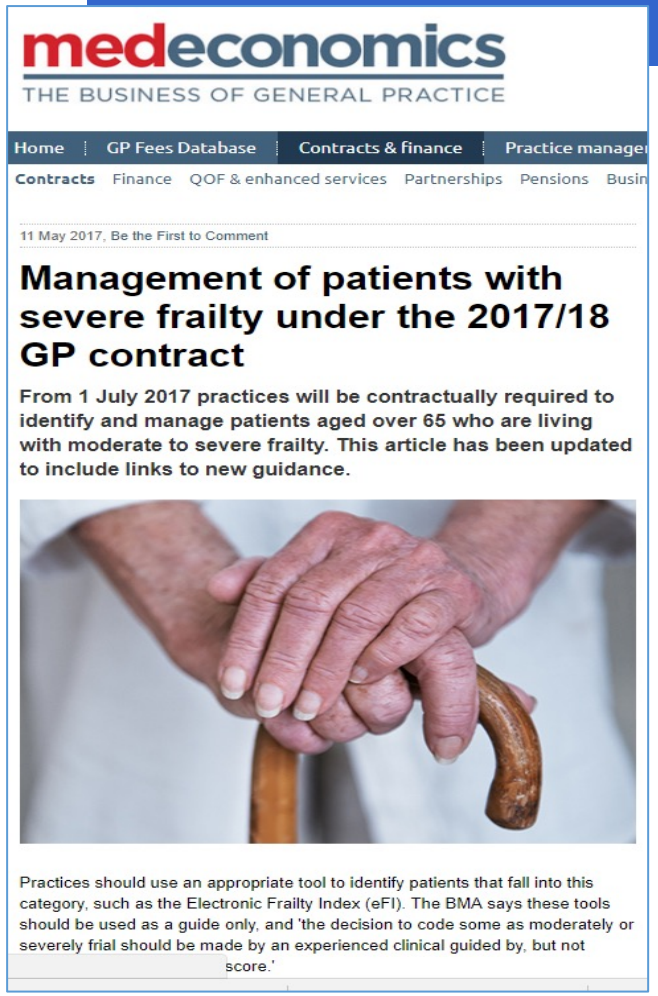
Threshold for Functional decline

Symptoms and/or signs become detectable - Clinical Detection

Age-related risk accumulation and homeostatic mechanisms dysfunction

Modified from: Angulo J et al. Redox Biology 2020; Studenski S. *J Nutr Health Aging* 2009;13:729-32; Ferrucci L et al. *Genus* 2005;LXI:39-53

GPs, new diabetes indicators - Frailty



medeconomics
THE BUSINESS OF GENERAL PRACTICE

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11 May 2017, Be the First to Comment

Management of patients with severe frailty under the 2017/18 GP contract

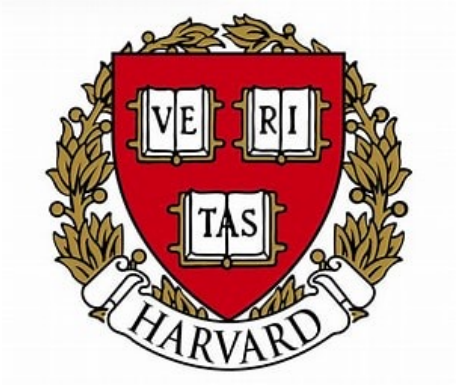
From 1 July 2017 practices will be contractually required to identify and manage patients aged over 65 who are living with moderate to severe frailty. This article has been updated to include links to new guidance.

Practices should use an appropriate tool to identify patients that fall into this category, such as the Electronic Frailty Index (eFI). The BMA says these tools should be used as a guide only, and 'the decision to code some as moderately or severely frial should be made by an experienced clinical guided by, but not score.'

The indicators

- NM157 – The percentage of patients with diabetes without moderate or severe frailty, on the register, in whom the last IFCC-HbA1c is 58mmol/mol or less in the preceding 12 months.
- **NM158 – The percentage of patients with diabetes with moderate or severe frailty, on the register, in whom the last IFCC-HbA1c is 75mmol/mol or less in the preceding 12 months.**
- NM159 – The percentage of patients with diabetes without moderate or severe frailty, on the register, in whom the last blood pressure reading (measured in the preceding 12 months) is 140/80mmHg or less.
- NM160 – The percentage of patients aged 25-84 years, with a diagnosis of type 2 diabetes, without moderate or severe frailty, not currently treated with a statin, who have had a consultation for a cardiovascular risk assessment using a risk assessment tool agreed with the NHS Commissioning Board in the last three years.
- NM161 – The percentage of patients with a diagnosis of type 2 diabetes and a recorded CVD risk assessment score of ≥10% (without moderate or severe frailty), who are currently treated with a statin (unless there is a contraindication or statin therapy is declined).
- NM162 – The percentage of patients with diabetes aged 40 years and over, with no history of CVD and without moderate or severe frailty, who are currently treated with a statin (excluding patients with type 2 diabetes and a CVD risk score of <10% recorded in the preceding 3 years).

Evidenced-Based Care: Diabetes in Older People



DIABETICMedicine
DOI: 10.1111/dme.13859

Invited Review

Evidence-based diabetes care for older people with Type 2 diabetes: a critical review

A. J. Sinclair[1], A. H. Abdelhafiz[2], A. Forbes[3] and M. Munshi[4]

[1]Foundation for Diabetes Research in Older People, Diabetes Frail Ltd, Droitwich, [2]Rotherham General Hospital, Rotherham, [3]Kings College, London, UK and [4]Harvard Medical School and Joslin Clinic, Boston, MA, USA

Accepted 5 November 2018

Abstract

In our ageing society diabetes imposes a significant burden in terms of the numbers of people with the condition, diabetes-related complications including disability, and health and social care expenditure. Older people with diabetes can represent some of the more complex and difficult challenges facing the clinician working in different settings, and the recognition that we have only a relatively small (but increasing) evidence base to guide us in diabetes management is a limitation of our current approaches. Nevertheless, in this review we attempt to explore what evidence there is to guide us in a comprehensive scheme of treatment for older adults, often in a high-risk clinical state, in terms of glucose lowering, blood pressure and lipid management, frailty care and lifestyle interventions. We strive towards individualized care and make a call for action for more high-quality research using different trial designs.
Diabet. Med. 00: 1–15 (2018)

Introduction and background

It is estimated that in 2017 there were 451 million (age 18–99 years) people with diabetes worldwide, and these figures are expected to increase to 693 million by 2045 [1]. A major shift in the epidemiology of diabetes has been to those aged 60–79 years [2]. Apart from this advancing tide of older people with diabetes, the ageing process itself is increasing the number of people living with the sequelae of ill health, chronic diseases, frailty and injuries, all of which enhance disability and functional decline, and pose real clinical challenges and burdens in those with Type 2 diabetes [3]. Older people with diabetes should be a priority target for focused interventions that bring about improved cardiovascular outcomes, enhanced safety and improved survival if the latter has worthwhile disability-free years and associated quality of life [4]. The important area of Type 1 diabetes in older adults is outside the scope of this review but must be addressed in due course.

We recognize that older people with diabetes can span four decades (ages 60–90 years and older), are not a homogeneous group and range from robust adults still in employment to frail residents of nursing homes. Thus, their cognitive and physical status vary widely, and they often have complex health and social care needs [4]. We therefore consider that our review of the literature in general pertains to those aged 70 years and over because the risks of comorbid illness, frailty and dependency begin to rise after this age, but we accept that other organizations may define being 'old' as less or more than 70 years [5]. It is also important to recognize that to produce valid and evidence-based recommendations for care, it is usually necessary to extrapolate research findings from clinical trials in younger adults, which is a limitation that has implications for developing clinical guidelines [6]. The modern management of older people with diabetes requires an acceptance by clinicians that recommendations of care should be tailored to the individual and take into consideration important factors such as changes in functional status, the comorbid illness profile, whether or not a person is dependent and their estimated life expectancy. These can have a marked influence on management goals, what care model is adapted, and how ongoing and follow-up care is delivered. We call this an 'individualizing care' scheme (Box 1).

Diabetes care for older people is often not straightforward for the reasons cited above, but as advancing age brings about increasing complexity of both the person with diabetes and the management of the illness itself, clinicians face greater challenges to their skills and competence. The different pathway to Type 2 diabetes in older individuals compared with younger individuals reflects changes in body composition, marked changes in insulin resistance in muscle and adipose tissues, a decrease in β-cell capacity and loss of normal insulin pulsatility, and the progressive negative effects on glucose tolerance of comorbid illness, onset of

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