Basic principles of Type 2 Diabetes management
NICE update: NG28

NICE National Institute for Health and Care Excellence

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DIABETES UK KNOW DIABETES. FIGHT DIABETES.

SOUTH ASIAN HEALTH FOUNDATION

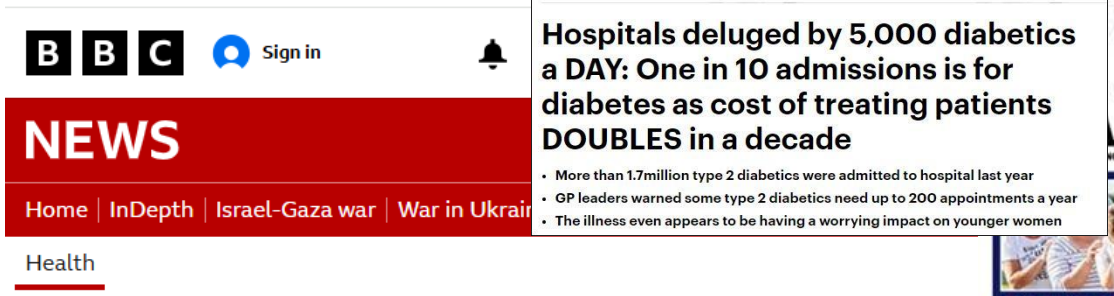
Conflicts of interest

'What about all those pretentious books you didn't read?'

NICE guidelines committee (2019 – 2023)

- **Core member: Type 1 diabetes in adults: diagnosis and management NG17**
- **Core member: Type 2 diabetes in adults: management NG28**
- **Core member: Diabetes in pregnancy: management from preconception to the postnatal period NG3**
- **Co-opted member: Chronic kidney disease (specifically DKD) NG203**

Cost of Diabetes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Health

NHS faces 'diabetes time bomb'

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Latest Headlines | Health

Hospitals deluged by 5,000 diabetics a DAY: One in 10 admissions is for diabetes as cost of treating patients DOUBLES in a decade

- More than 1.7million type 2 diabetics were admitted to hospital last year
- GP leaders warned some type 2 diabetics need up to 200 appointments a year
- The illness even appears to be having a worrying impact on younger women


'We got married on telly - and we are still together'

Chelsea departure Manager Pochettino agrees to leave

The Guardian

Alarm over big increase in under-40s with diabetes

Former marine charged in spy case found dead

British passenger dies in severe plane turbulence


Daily Mail

TRUMP IN CRISIS

The porn star, a supergrass lawyer . . . and why, this time, Donald's house of cards really could topple

BRITAIN'S DIABETES EXPLOSION

Unhealthy lifestyles to trigger huge rise in heart attacks and strokes

Strictly's Anton Shirley: I've only had ONE date in 3 years


5p DAILY EXPRESS

BRIGHTEST STAR IN THE SKY

Sir Patrick Moore, astronomer and broadcaster, dies aged 89

MILLIONS SEE JAMES WIN X FACTOR SHOWDOWN

WIN £250 WORTH OF ALDI VOUCHERS FOR CHRISTMAS

DIABETES CRISIS TO CRIPPLE NHS

AILY EXPRESS

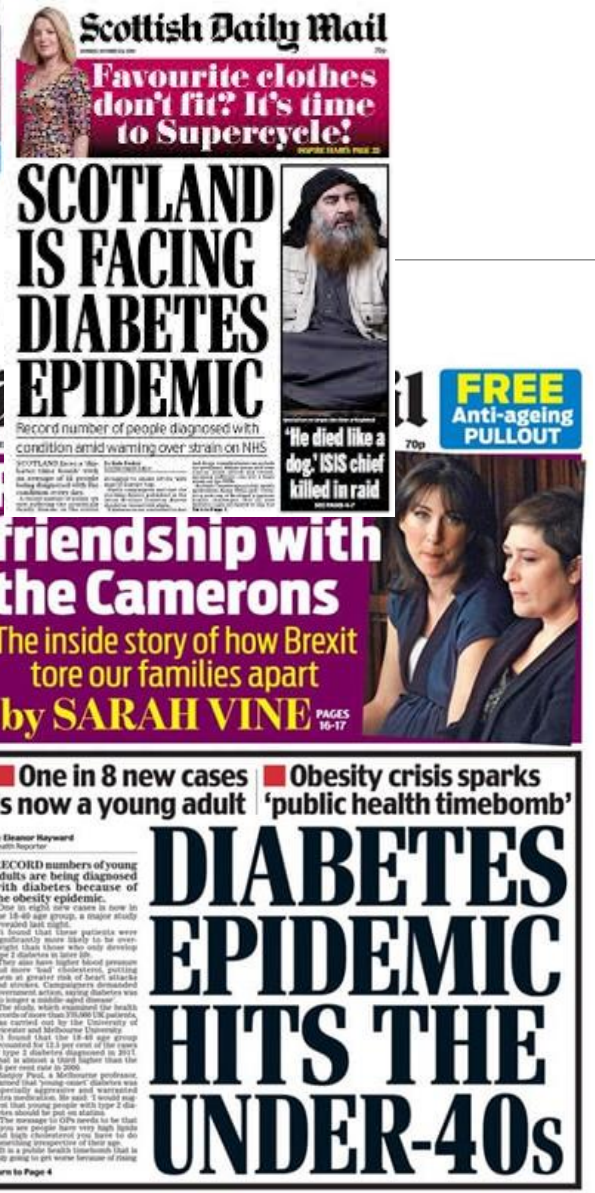
SO INSPIRING...FAMILY OF TEN WHO SURVIVED BREAST CANCER

Boris will ask Queen to recall MPs if he loses court battle

DIABETES: THE FORECAST TO SHOCK BRITAIN

One in four hospital beds will be occupied by diabetics in 11 years

BAKE OFF: What got Paul Hollywood hot under the collar?


Scottish Daily Mail

Favourite clothes don't fit? It's time to Supercycle!

SCOTLAND IS FACING DIABETES EPIDEMIC

Record number of people diagnosed with condition amid warning over strain on NHS

'He died like a dog.' ISIS chief killed in raid

FREE Anti-ageing PULLOUT

friendship with the Camerons

The inside story of how Brexit tore our families apart

by SARAH VINE PAGES 16-17

One in 8 new cases is now a young adult

Obesity crisis sparks 'public health timebomb'

DIABETES EPIDEMIC HITS THE UNDER-40s

Received: 8 March 2024 | Accepted: 22 March 2024
DOI: 10.1111/dme.15326

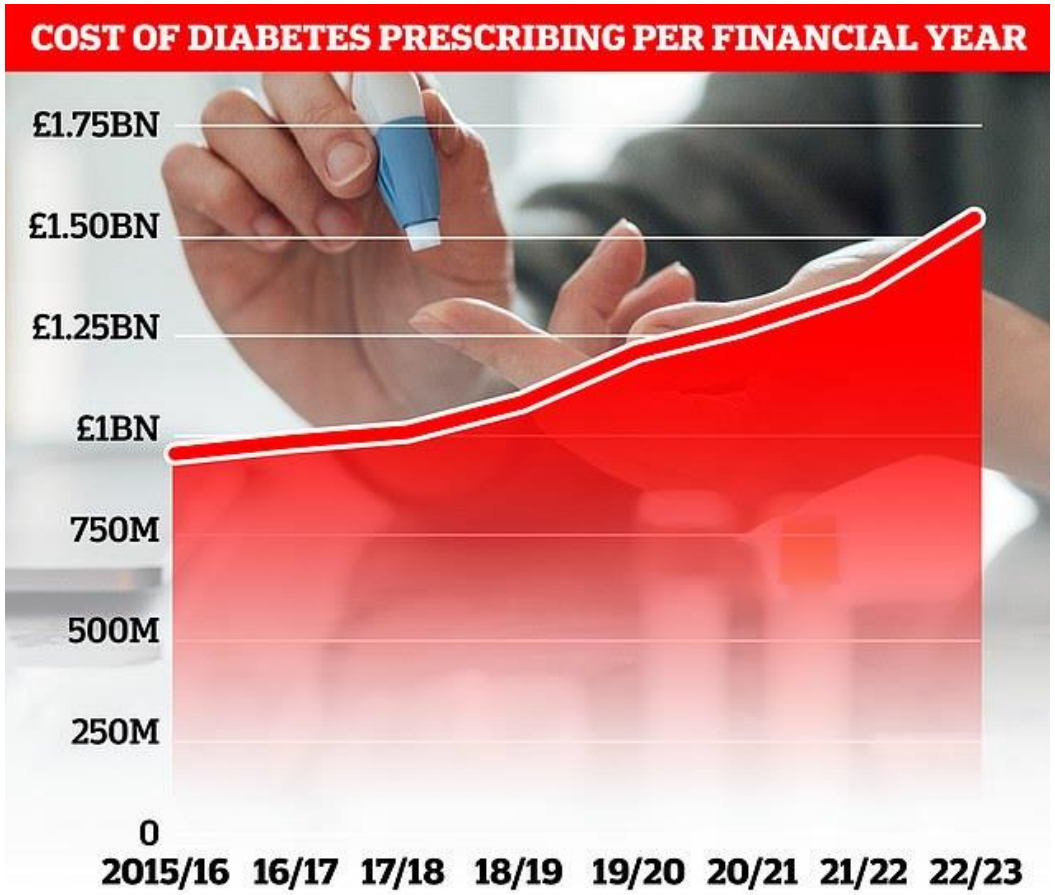
RESEARCH ARTICLE
Health Economics

Estimation of the direct health and indirect societal costs of diabetes in the UK using a cost of illness model

Nick Hex[1] | Rachael MacDonald[1] | Jessica Pocock[1] | Barbara Uzdzinska[1] | Matthew Taylor[1] | Marc Atkin[2] | Sarah H. Wild[3] | Hannah Beba[4] | Ross Jones[5]

- Study carried out by York Health Economics Consortium & commissioned by DUK
- **NHS spends £ 10.7 bn a year** on diabetes (USD 14.7 bn) → 2035 estimated to increase to £ 18 bn
- Globally: diabetes-related health expenditures (direct costs) **~$ 1 trillion USD** - 11.5% of total global health spending
- Approx £ 4.4bn per yr: routine diabetes care:
  - Diagnosis/ diabetes appointments/ eye screening/ blood tests/ medications/ diabetes technology/ education and support programmes
- Every week diabetes leads to:
  - 2,990 cases of HF/ 930+ CVA/ 660 MI/ 184 amputations
- **Diabetes complications costs the UK healthcare system £ 6.2 bn a year**
  - 60% of overall costs of diabetes to the NHS
  - 6% of the UK health budget

Cost of treatment?



- Metformin:
  - £1
- Gliclazide:
  - £1.60
- Empagliflozin:
  - £35
- Mounjaro:
  - £85 - 120

The purpose of guidelines

To guide clinical decision making

- Distill all the evidence into actionable clinical choices

To grade the strength of recommendations

- Empowers healthcare professionals and patients to decide which choices are the most important

To guide regulators and payers in making interventions available

To highlight areas where evidence is lacking

National Institute for Health and Care Excellence

- Established in April 1999
- Provides guidance to NHS England & Wales
- Multiple work streams or ‘centres’ producing guidance

Centre for Public Health Excellence

Guidance on topics such as smoking cessation and obesity

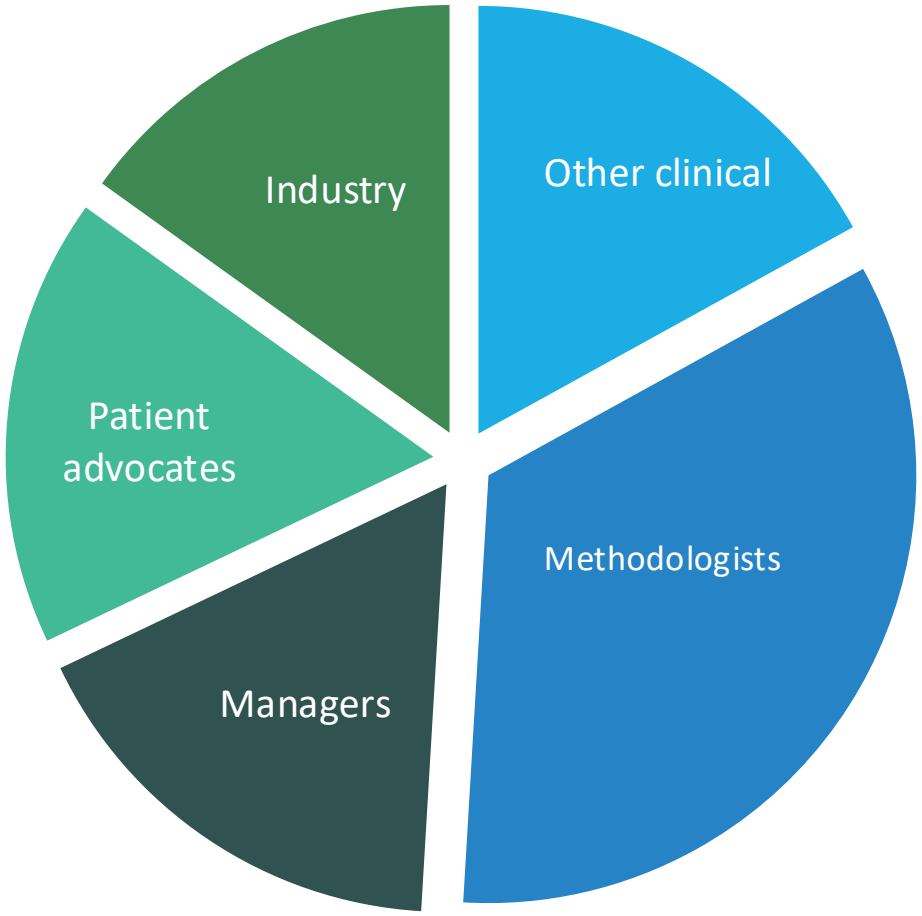
Centre for Clinical Practice

Clinical guidelines for the management of individual conditions, e.g. diabetes

Centre for Health Technology Evaluation

Technology appraisals
Interventional procedure guidance
Evaluation of medical diagnostic technology and ‘medical technologies’/devices

Who is ‘the decision maker’?
Who sits on the Appraisal Committees?



- Manufacturer representatives
- Clinical & patient experts
- Advisory Group team
- Evidence Research Group team
- NICE technical team

Classification of Bryan et al. (2007); * NICE Website, June 2011

Multiple stakeholders provide critical evidence and commentary

Input from clinicians is critical:

- Disease background (including epidemiology, natural disease history and patient subgroups)
- Current treatments ('comparator' technologies) and the likely role of the new technology
- Experience of use in routine practice, effectiveness and adverse events
- Impact on NHS service delivery, personnel and education, patients

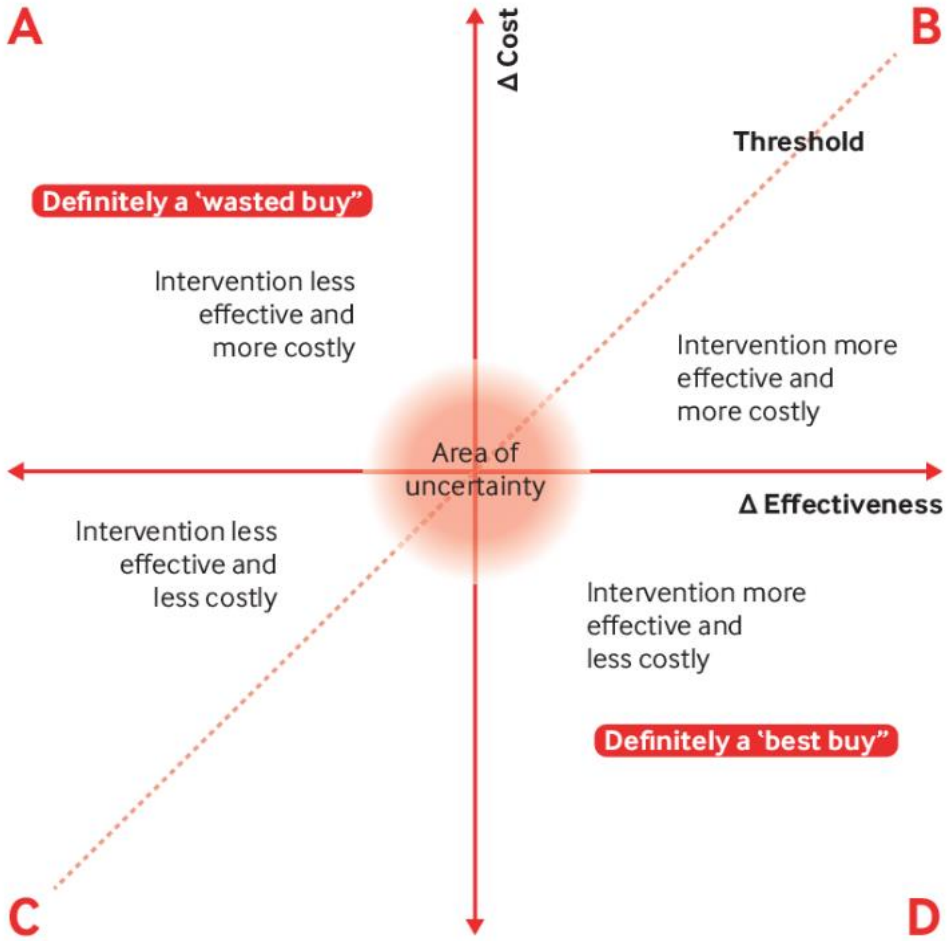
Hierarchy of evidence

Level	Description
1++	High quality meta-analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias
1+	Well conducted meta-analyses, systematic reviews of RCTs, or RCTs with a low risk of bias
1-	Meta-analyses, systematic reviews or RCTs, or RCTs with a high risk of bias
2++	High quality systematic reviews of case-control or cohort studies *or* High quality case-control or cohort studies with a very low risk of confounding, bias, or chance and a high probability that the relationship is causal
2+	Well conducted case-control or cohort studies with a low risk of confounding, bias, or chance and a moderate probability that the relationship is causal
2-	Case-control or cohort studies with a high risk of confounding, bias, or chance and a significant risk that the relationship is not causal
3	Non-analytic studies, e.g. case reports, case series
4	Expert opinion

Harbour R and Miller J BMJ 2001

How do we judge value-for-money?
How are costs and health effects drawn together?

Cost effectiveness paradigm

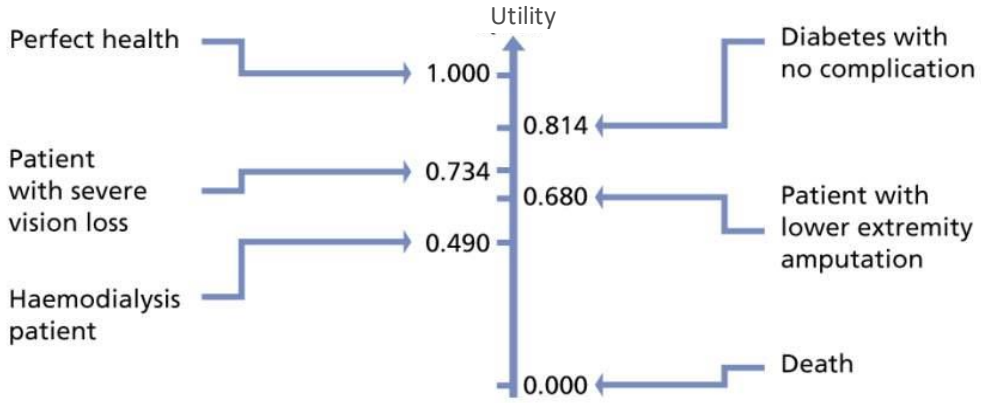


QoL values: examples

- From NICE evaluation of Lucentis
- Age-related macular degeneration
  - Full health (including sight) = 100%
  - Mild disease = 83%
  - Moderate disease = 73%
  - Severe disease = 57%

What is a QALY?

- A Quality Adjusted Life Year (QALY) is a factor of both the quality & quantity of life
- A QALY places a weight on time in different health states, and is a 'common currency' for comparing benefits gained from a variety of interventions on both quality of life and survival
- One QALY is the equivalent of one year in full health



Examples of quality of life (utility) scores for common diabetes related health states

- An example of a QALY calculation:

	New Drug	Existing Drug
Effectiveness	Gives an additional 2 years of life, at a utility of 0.8	Gives an additional 1.5 years of life, at a utility of 0.7
Total treatment costs	£25,000	£10,000
Total QALYs	2 x 0.8 = 1.6	1.5 x 0.7 = 1.05
Difference in QALYs	1.6 - 1.05 = 0.55	
Difference in costs	£25,000 - £10,000 = £15,000	
Cost per QALY	**£15,000 / 0.55 = £27,272**	

NICE Panel: Reviewing the evidence

What do the panel look at:

- Robustness of the evidence base (sufficient sample, more than one trial, broad inclusion criteria)
- Clinical trial design (pragmatic, prespecified SAP, attention to SAE)

Expectations:

- Data quality
- Trial data summaries
- The economic model

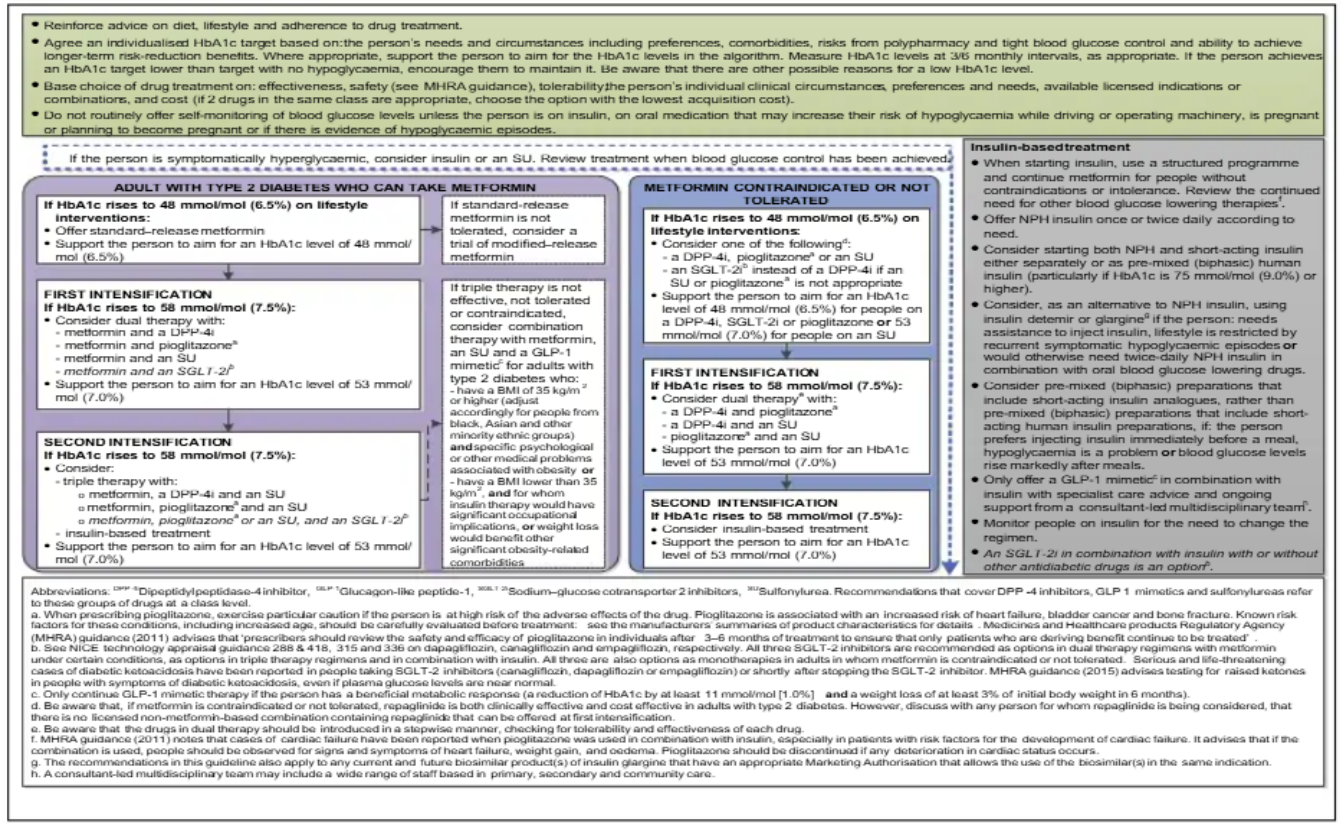
Panel take Stakeholder comments into consideration

- Quality of comments
- Constructive, reasoned and considered

NICE guidelines 2015

NICE National Institute for Health and Care Excellence

Algorithm for blood glucose lowering therapy in adults with type 2 diabetes



'Type 2 diabetes in adults: management', NICE guideline NG28. Published December 2015, last updated April 2017.

Primarily tailored to NHS:

1. Core Focus and Philosophy

- ❑ Glucose management
- ❑ Ensuring treatments cost-effective within the NHS
- ❑ Step-wise approach

2. Treatment Sequence and Drug Choice

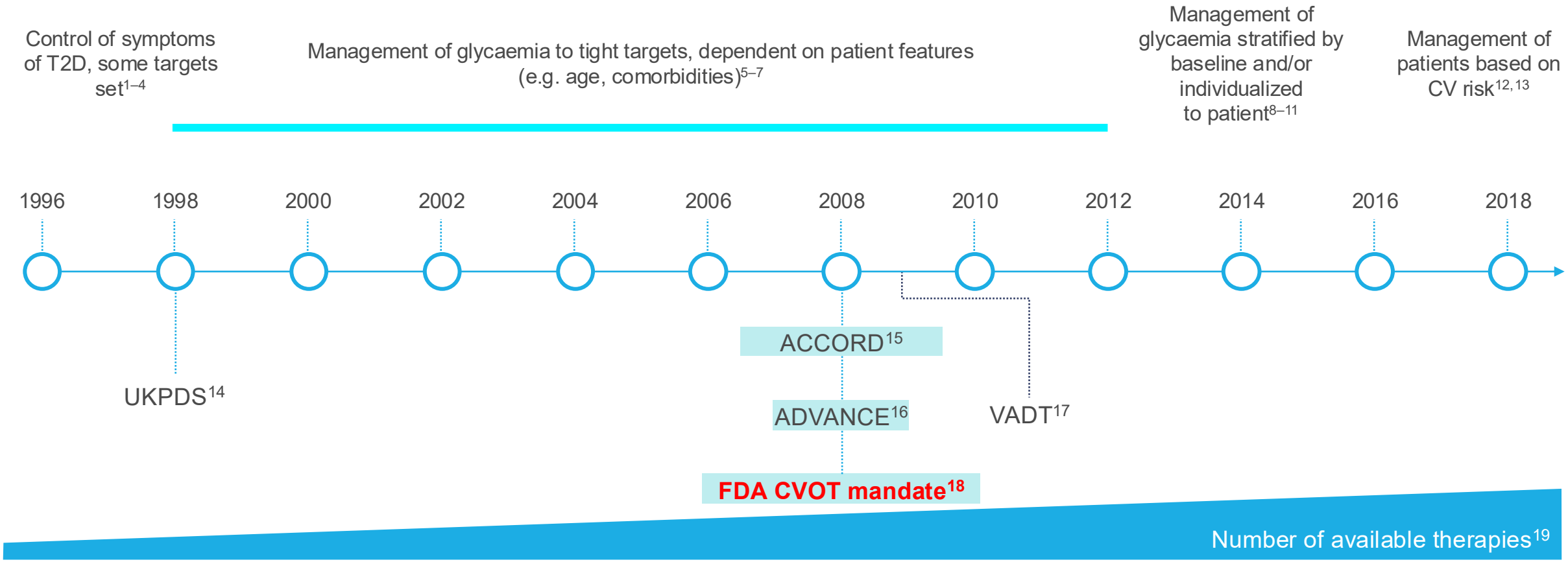
- ❑ **First-Line: Metformin** unless contraindicated
- ❑ **Second-Line (After Metformin):**
  - Sulfonylureas or DPP-4i
  - SGLT-2i and GLP-1RA: less favourable due to high costs

3. Patient Characteristics and Assessment

- ❑ Rigid criteria for certain medications (e.g. BMI for GLP-1RA)
- ❑ Recommended stopping drugs if a specific, high HbA1c reduction (e.g., 11 mmol/mol) **not** achieved within 6 months

The evolution of T2D glucose-lowering guidelines

Transition in focus of care over time



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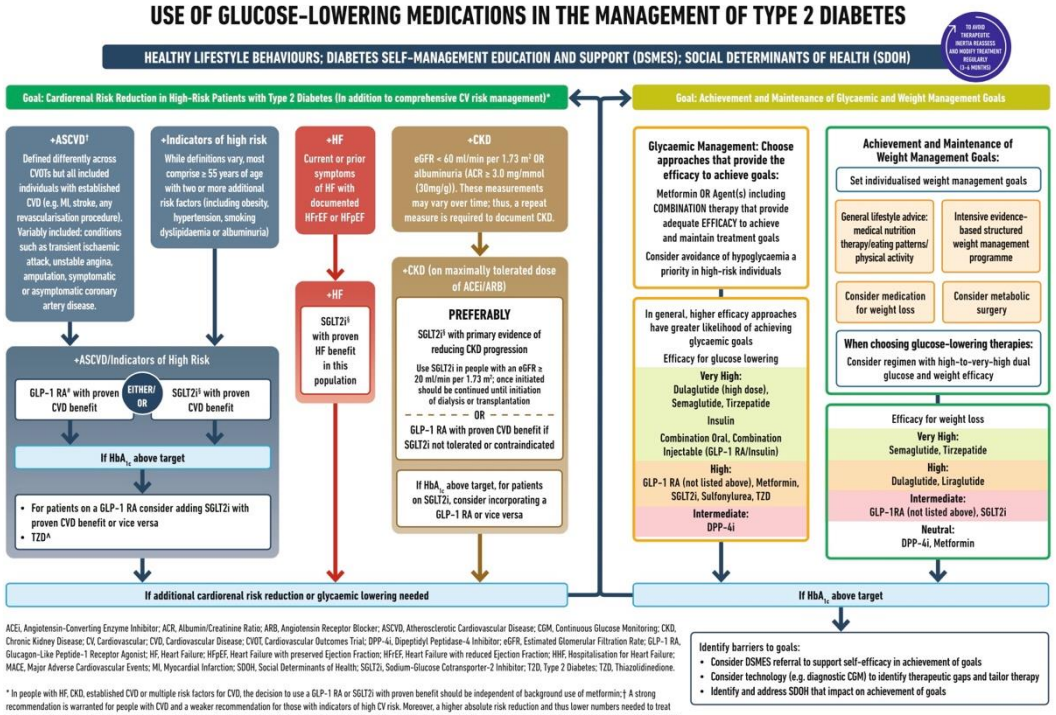
Diabetologia
https://doi.org/10.1007/s00125-022-05787-2

CONSENSUS REPORT

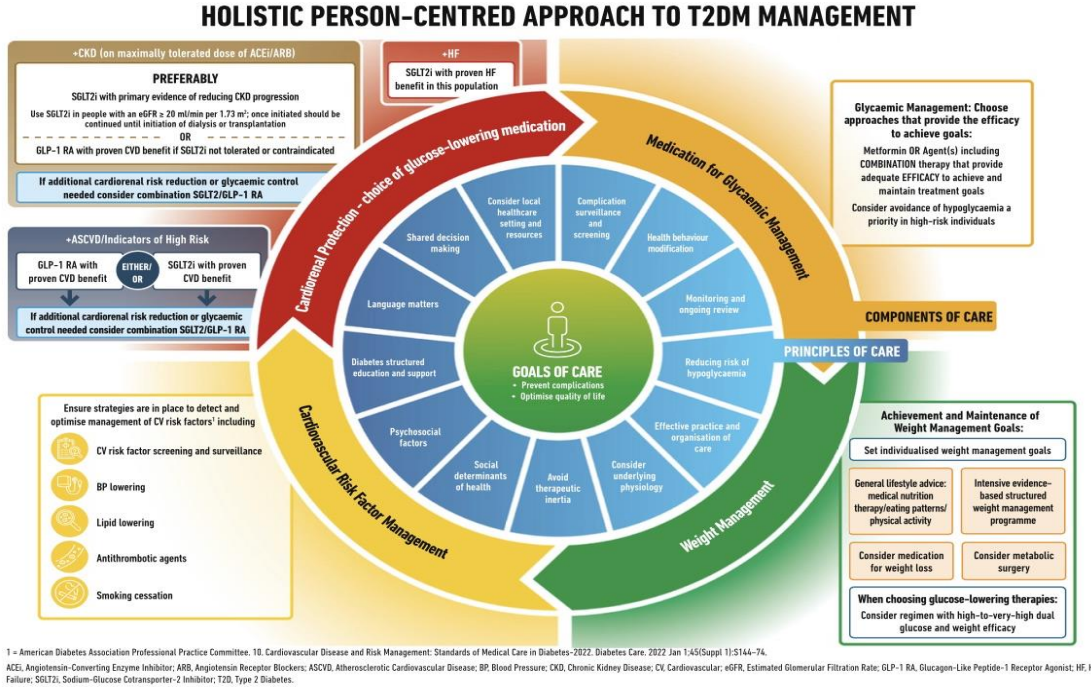
Management of hyperglycaemia in type 2 diabetes, 2022. A consensus report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD)

Melanie J. Davies[1,2] · Vanita R. Aroda[3] · Billy S. Collins[4] · Robert A. Gabbay[5] · Jennifer Green[6] · Nisa M. Maruthur[7] · Sylvia E. Rosas[8] · Stefano Del Prato[9] · Chantal Mathieu[10] · Geltrude Mingrone[11,12,13] · Peter Rossing[14,15] · Tsvetalina Tankova[16] · Apostolos Tsapas[17,18] · John B. Buse[19]



ACEi, Angiotensin-Converting Enzyme Inhibitor; ACR, Albumin/Creatinine Ratio; ARB, Angiotensin Receptor Blocker; ASCVD, Atherosclerotic Cardiovascular Disease; CGM, Continuous Glucose Monitoring; CKD, Chronic Kidney Disease; CV, Cardiovascular; CVD, Cardiovascular Disease; CVOT, Cardiovascular Outcomes Trial; DPP-4i, Dipeptidyl Peptidase-4 Inhibitor; eGFR, Estimated Glomerular Filtration Rate; GLP-1 RA, Glucagon-Like Peptide-1 Receptor Agonist; HF, Heart Failure; HFpEF, Heart Failure with preserved Ejection Fraction; HFrEF, Heart Failure with reduced Ejection Fraction; HHF, Hospitalisation for Heart Failure; MACE, Major Adverse Cardiovascular Events; MI, Myocardial Infarction; SDOH, Social Determinants of Health; SGLT2i, Sodium-Glucose Cotransporter-2 Inhibitor; T2D, Type 2 Diabetes; TZD, Thiazolidinedione.

* In people with HF, CKD, established CVD or multiple risk factors for CVD, the decision to use a GLP-1 RA or SGLT2i with proven benefit should be independent of background use of metformin; † A strong recommendation is warranted for people with CVD and a weaker recommendation for those with indicators of high CV risk. Moreover, a higher absolute risk reduction and thus lower numbers needed to treat are seen at higher levels of baseline risk and should be factored into the shared decision-making process. See text for details; ^ Low-dose TZD may be better tolerated and similarly effective; § For SGLT2i, CV/renal outcomes trials demonstrate their efficacy in reducing the risk of composite MACE, CV death, all-cause mortality, MI, HHF and renal outcomes in individuals with T2D with established/high risk of CVD; # For GLP-1 RA, CVOTs demonstrate their efficacy in reducing composite MACE, CV death, all-cause mortality, MI, stroke and renal endpoints in individuals with T2D with established/high risk of CVD.



1 = American Diabetes Association Professional Practice Committee. 10. Cardiovascular Disease and Risk Management: Standards of Medical Care in Diabetes-2022. Diabetes Care. 2022 Jan 1;45(Suppl 1):S144–74.

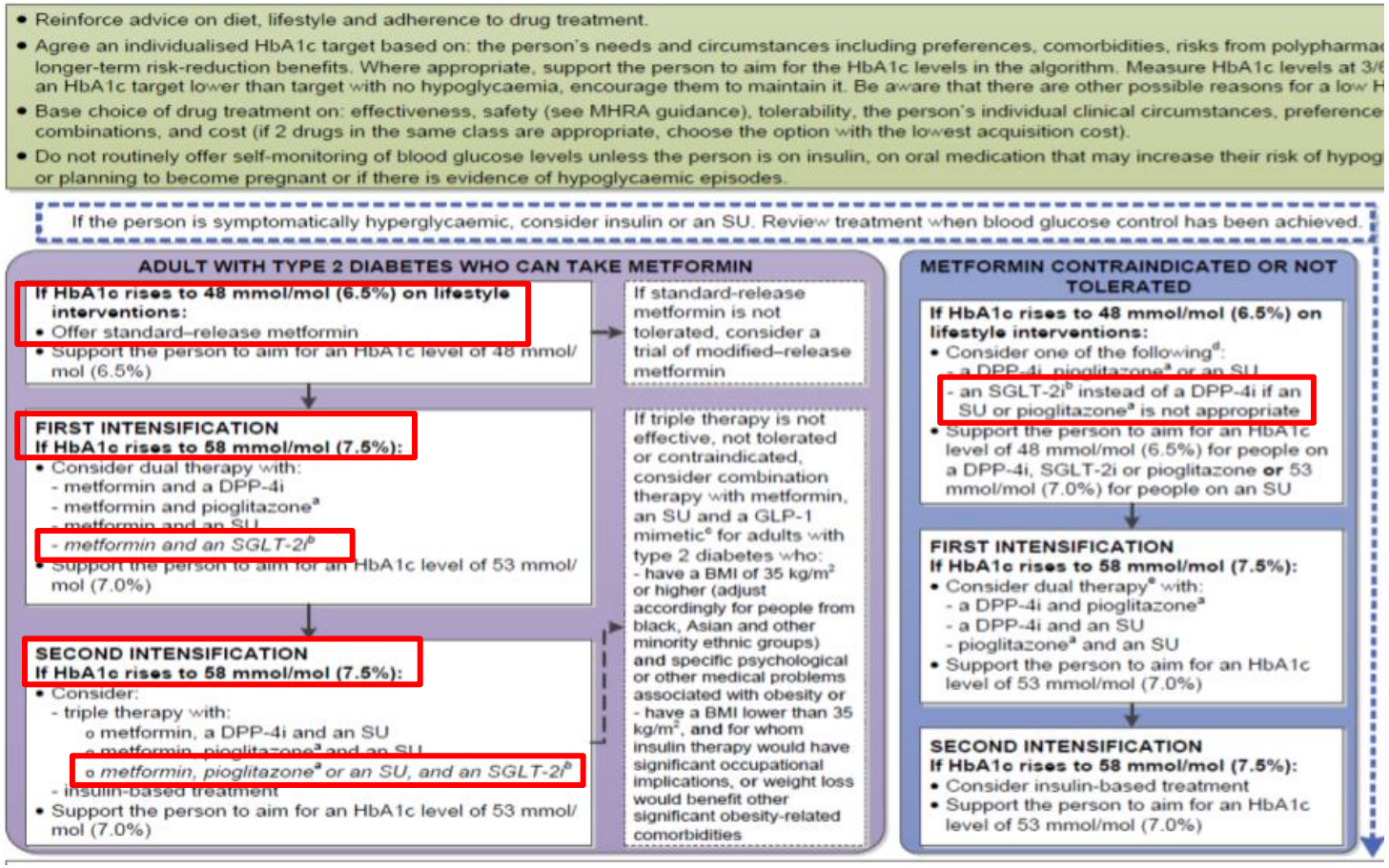
ACEi, Angiotensin-Converting Enzyme Inhibitor; ARB, Angiotensin Receptor Blockers; ASCVD, Atherosclerotic Cardiovascular Disease; BP, Blood Pressure; CKD, Chronic Kidney Disease; CV, Cardiovascular; eGFR, Estimated Glomerular Filtration Rate; GLP-1 RA, Glucagon-Like Peptide-1 Receptor Agonist; HF, Hea Failure; SGLT2i, Sodium-Glucose Cotransporter-2 Inhibitor; T2D, Type 2 Diabetes.

Fig. 4 Holistic person-centred approach to T2DM management

NICE guidelines (2015) vs EASD/ADA consensus

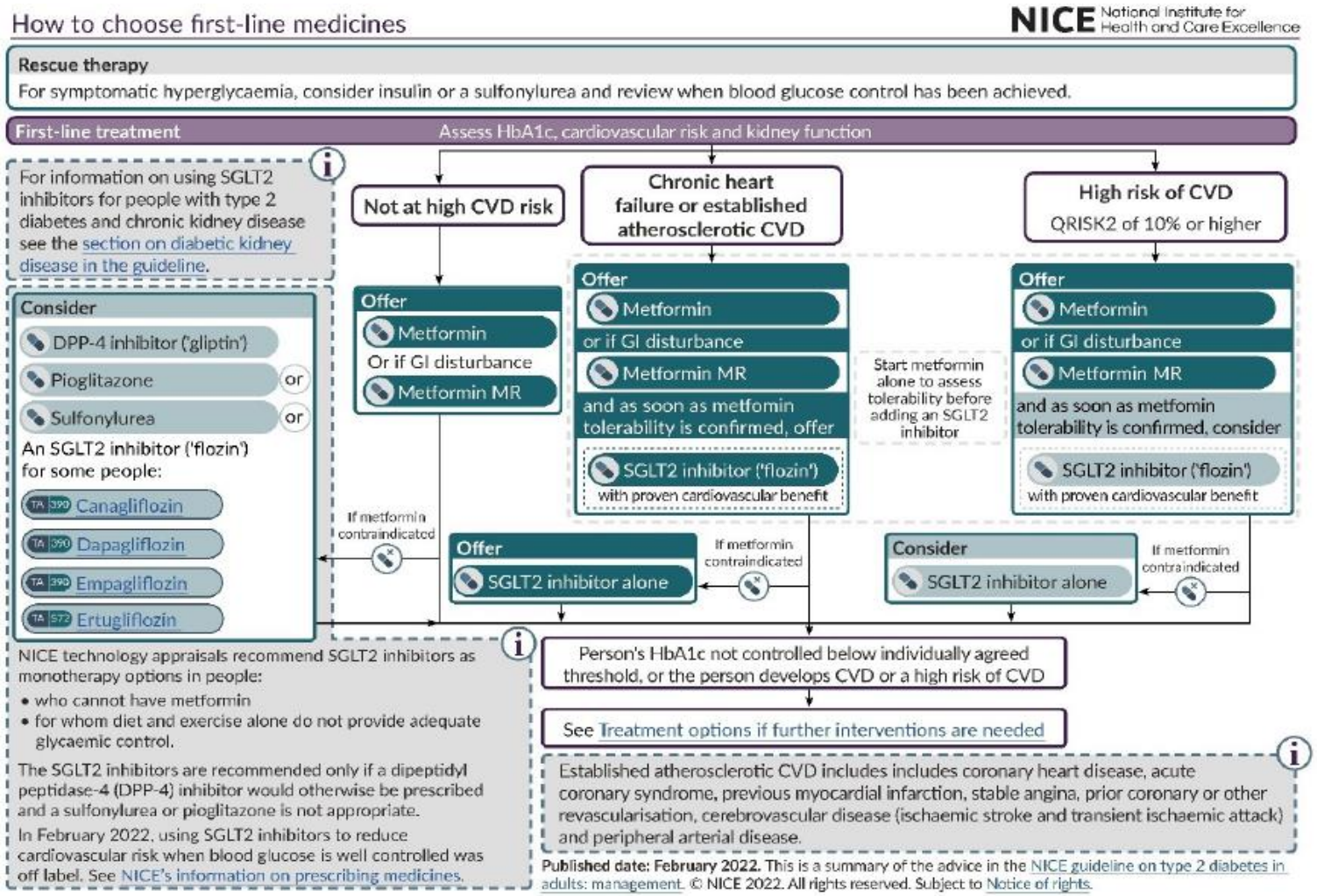
Feature	NICE Guidelines (UK)	EASD Guidelines (Intl.)
Primary Driver	Cost-effectiveness (NHS) & Step-wise control	Comorbidities & Personalized Risk-stratification
Philosophy	"One-size-fits-all" (traditional)	Individualized, patient-centered
Key Priority	Lowering HbA1c / Cost	Preventing cardiorenal complications
SGLT2i/GLP-1s	Second-line/Specific criteria	Early use (often second-line or sooner)
Discontinuation	Clear criteria (11 mmol/mol, 6 months)	No specific criteria; based on clinical judgment
Status	Legal/Systemic guidance for NHS	Expert consensus report

Previous 2015 NICE T2D guidelines were out of date, glucose focussed and very restrictive with respect to SGLT-2i

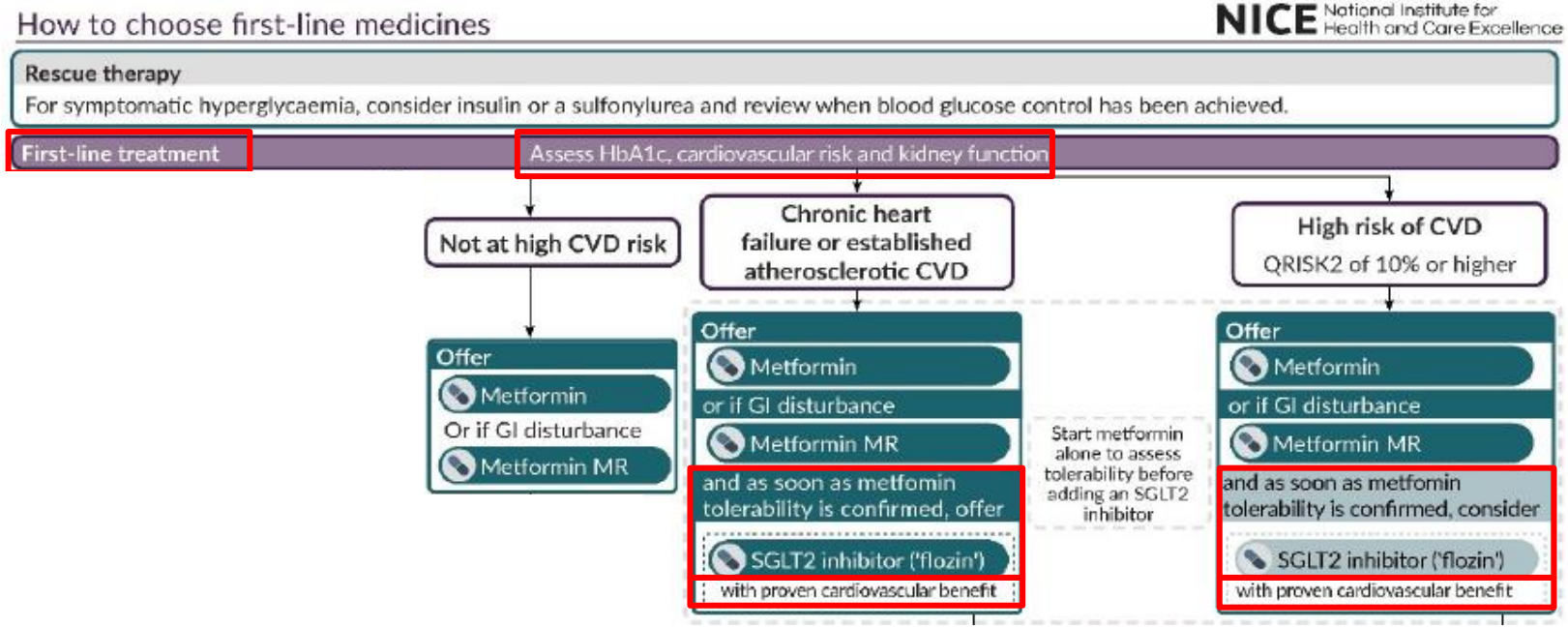


- Treatment change and intensification **dictated by HbA1c only**
- **First line**: **only metformin**
- SGLT-2i recommended for consideration:
  1. At **first intensification**, as dual therapy + metformin ONLY if SU contraindicated
  2. At **second intensification**, as triple therapy ONLY in combination with metformin, + SU
  3. When **metformin is contraindicated/not tolerated** instead of DPP-4i only if SU or pioglitazone is not appropriate

Updated NG28 guidelines were a significant move ‘from glucose to risk’ & place SGLT-2i as a cornerstone of diabetes disease management



The updated guideline has several substantial and important changes vs the 2015 version



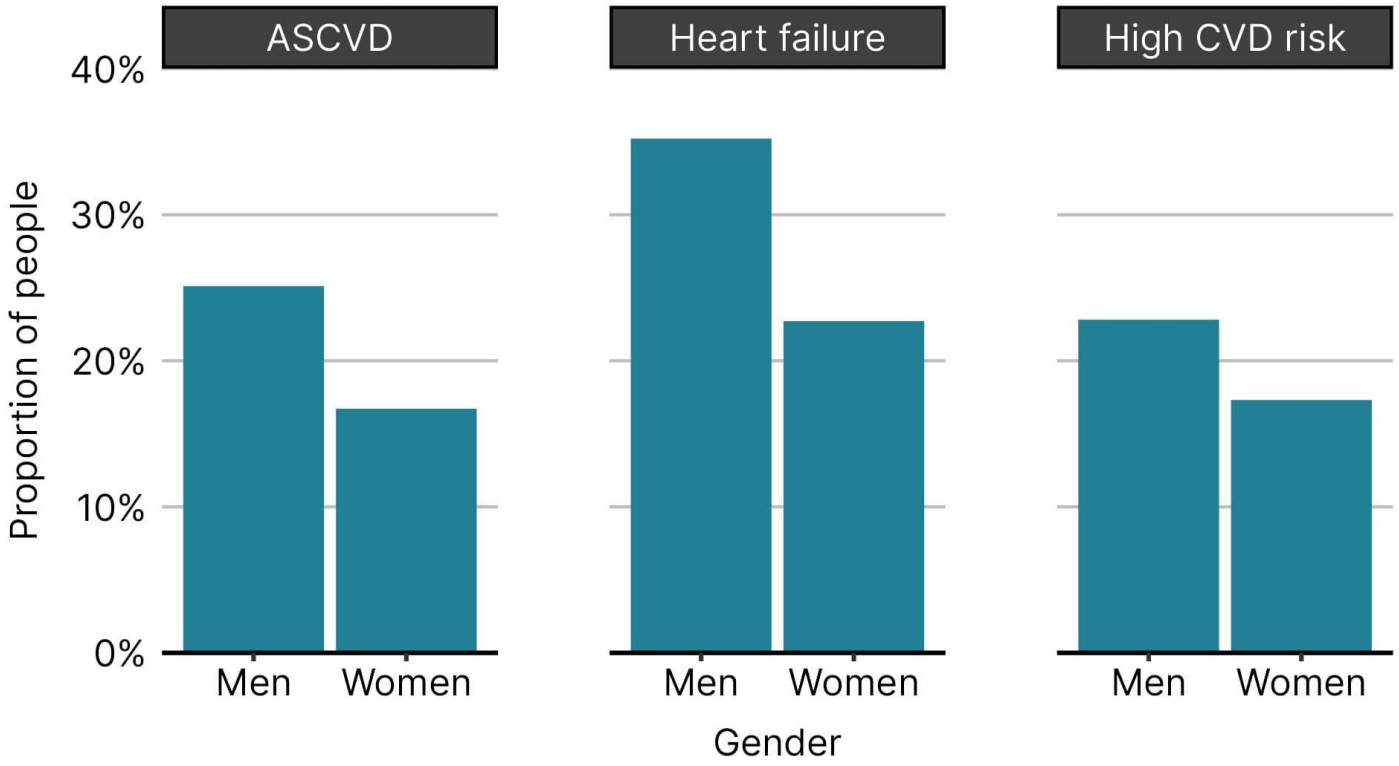
- Focus on comprehensive assessment and treatment from diagnosis
- Parallel assessment A1c, CV risk and kidney function
- SGLT-2i recommended as dual first line with metformin
- SGLT-2i with proven CV benefit now recommended in >90% T2D pts

NICE analysis 2024

- Analysis of health records in England
- ~590,000 people
- Significant disparities in SGLT-2 inhibitor prescriptions for T2D in England
- **SGLT-2i not offered equitably across the UK**
- SGLT-2i under-prescribed:
  - Women
  - Older people
  - Black or Black British individuals
- Analysis of primary care data → proportion of people prescribed SGLT-2i low:
  - 1 in 5 people with co-morbid ASCVD/ at high risk of CVD had current prescription for SGLT-2i vs 1 in 3 pts with CHF

Inequality of access: Women less likely to have a current SGLT-2i prescription

Figure 2: Proportion of type 2 diabetes patients with an SGLT-2i prescription in England, by gender and comorbidity



Patients with co-morbid heart failure & current prescription:

- 1 in 4 women (23%)
- 1 in 3 men (35%)

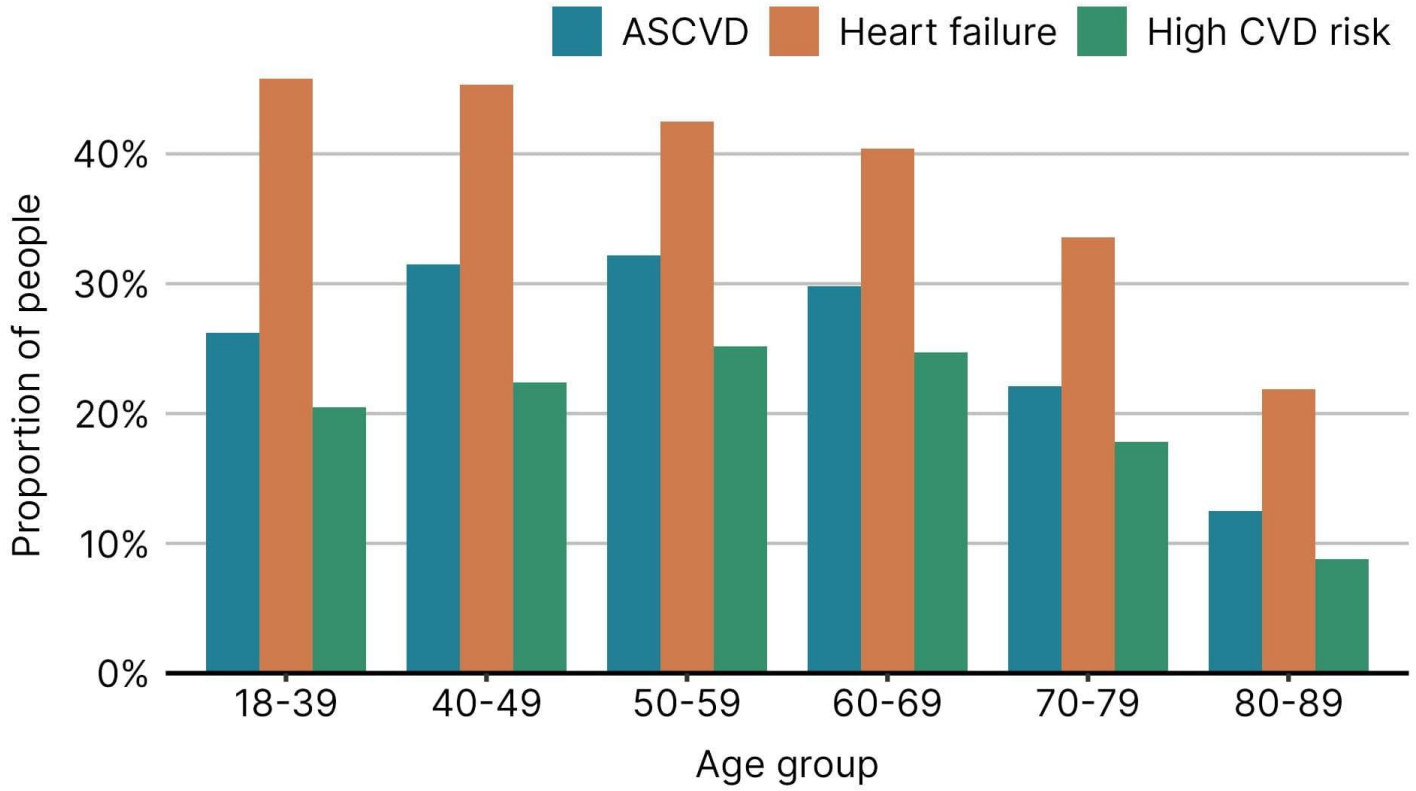
Similar pattern seen in women with ASCVD or high CVD risk

NB. UTIs & thrush/ Pregnancy & breast feeding which may contribute to lower use in women

NICE analysis of Clinical Practice Research Datalink (CPRD) data 2024

Inequality of access: Older age groups less likely to have a current SGLT-2i prescription

Figure 1: Proportion of type 2 diabetes patients with an SGLT-2i prescription in England, by age group and comorbidity



People with ASCVD & current prescription:

- 32% aged 50-59 yrs
- 13% aged 80-89 yrs

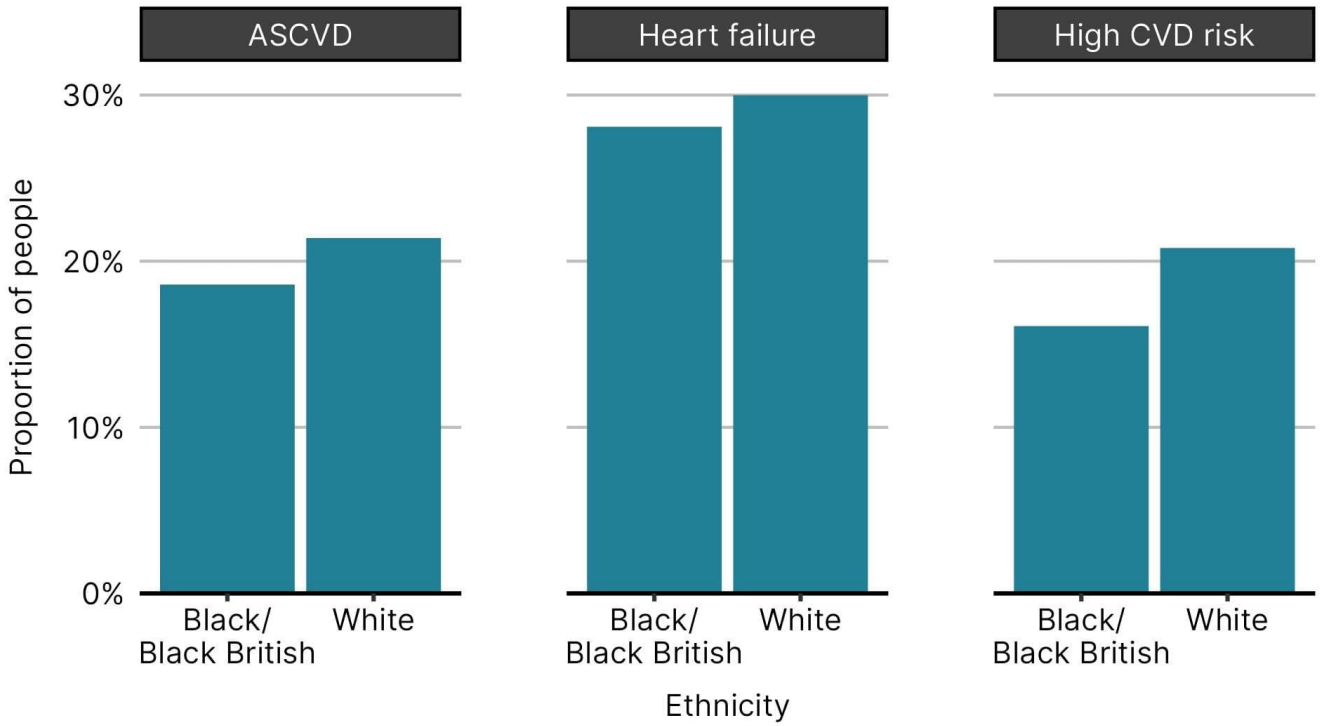
Similar age-related trends seen in people with heart failure or high CVD risk

NB. Polypharmacy/ resistance to switching

NICE analysis of Clinical Practice Research Datalink (CPRD) data 2024

Inequality of access: Black or Black British less likely to have a current SGLT-2i prescription

Figure 3: Proportion of type 2 diabetes patients with an SGLT-2i prescription in England, by ethnicity and comorbidity



People with current prescription by gender

- Lower percentage Black/ Black British people vs
- White people had a prescription

All groups (ASCVD, CHF or high CVD risk)
Differences smaller than by age or gender

Patients with high CVD risk & current prescription:

- 16% Black/ Black British people
- 21% White people

Odds of receiving prescriptions with ASCVD lower by:

- 22% Black/ Black British people
- 15% Socioeconomically deprived

NICE analysis of Clinical Practice Research Datalink (CPRD) data 2024

Update August 2025: Draft NICE NG28 guidelines

Type 2 diabetes in adults: choosing, reviewing and changing medicines

Diet and behaviour change advice

At each point reinforce advice about diet and behaviour change.

Involving people in medicine discussions

Discuss the benefits and risks of every medicine with adults with type 2 diabetes, and support them to make an informed decision about their treatment. Take into account the effectiveness of each medicine in terms of:

- metabolic response, and
- cardiovascular and renal protection.

If a person has more than one comorbidity (for example cardiovascular disease and obesity), make a shared decision with them about which comorbidity to prioritise when choosing medicines.

Reviewing medicines

When reviewing treatments, discuss all changes with the person with type 2 diabetes.

Optimise their current treatment regimen before changing treatments, taking into account factors such as:

- adverse effects
- adherence to existing medicines
- the need to revisit advice about diet and self-management
- prescribed doses and formulations.

If the person has reached their glycaemic and weight targets, consider continuing any medicines that have contributed to this.

Consider continuing SGLT-2 inhibitors for their cardiovascular or renal benefits, even if they do not help the person reach their glycaemic or weight targets.

Stop GLP-1 receptor agonists if:

- they do not help the person reach their glycaemic or weight targets, and
- the person does not have cardiovascular disease or early onset type 2 diabetes.

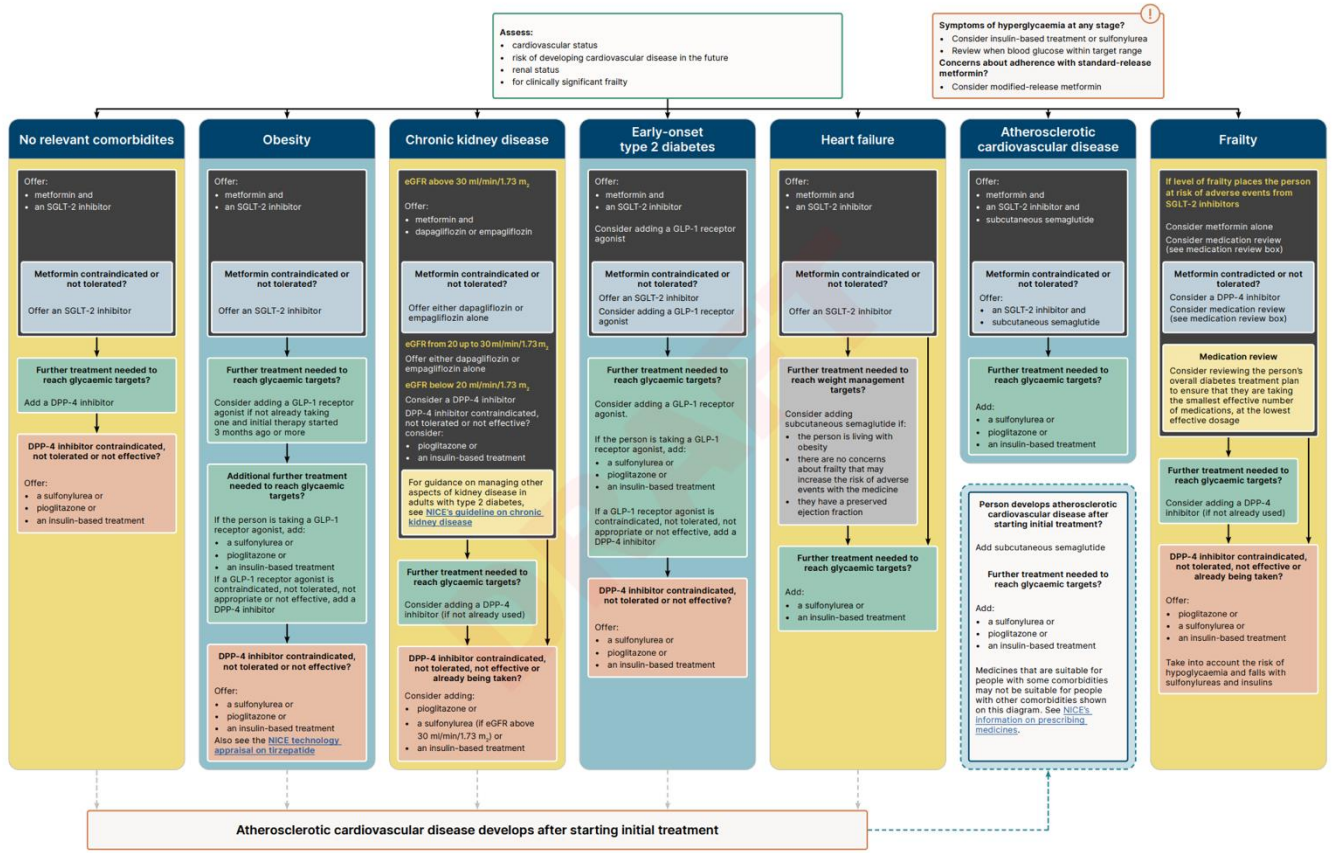
Do not offer a GLP-1 receptor agonist and a DPP-4 inhibitor together to treat type 2 diabetes.

People already on standard-release metformin

If standard-release metformin is effective and tolerated, continue its use.

If it is not tolerated, change to modified-release metformin.

Type 2 diabetes in adults: choosing medicines for first line and further treatment



NICE National Institute for Health and Care Excellence

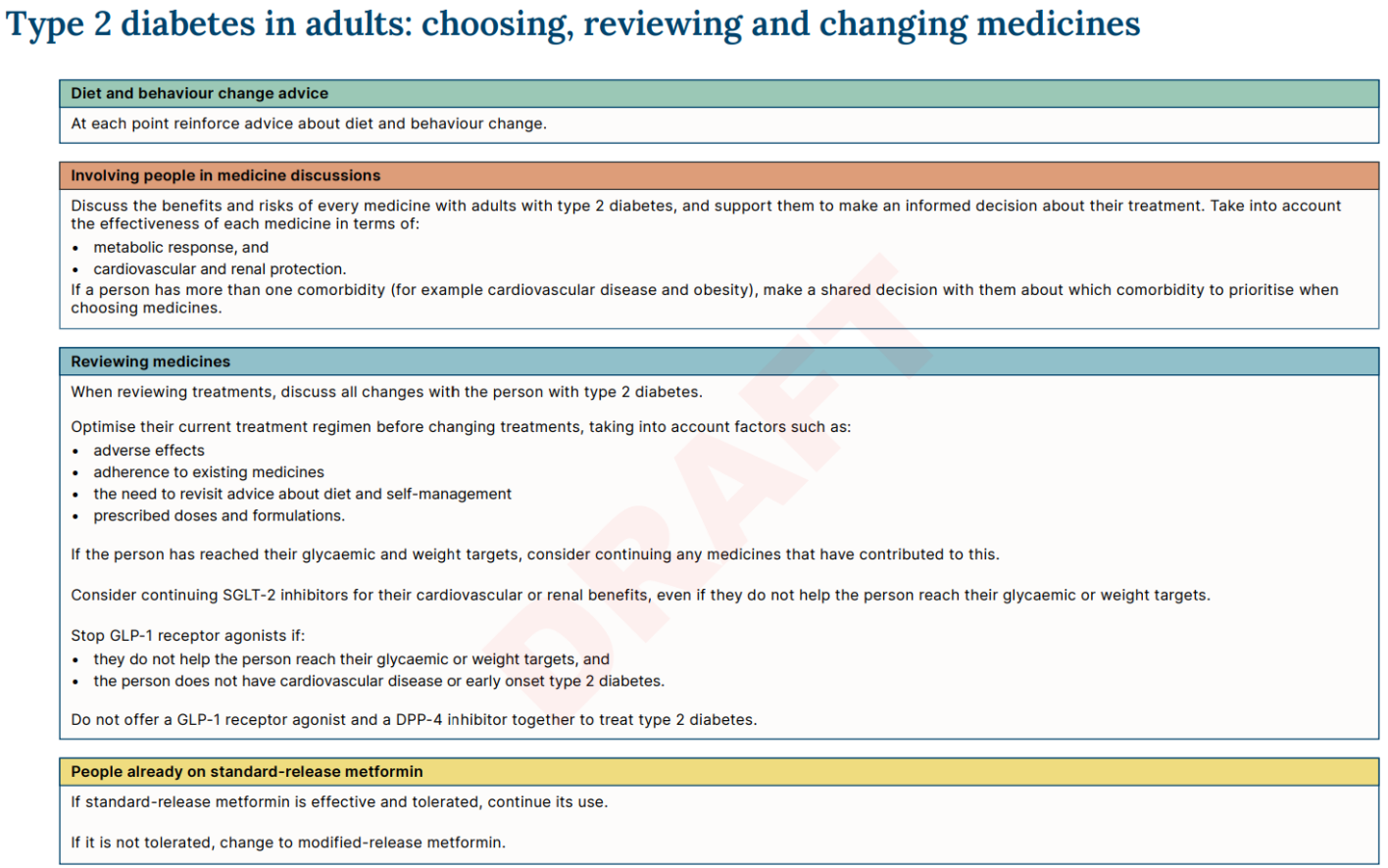
Update August 2025: Draft NICE NG28 guidelines

- Draft guideline introduces different treatment approaches based on:
  - Patient characteristics
  - Co-morbidities

- Shift towards a more personalised approach
- Moves away from a 'one-size-fits-all' approach

- Aligns closer with international (EASD) guidelines

- Aligns with NHS 10-Year Health Plan: shift from treatment to prevention



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- the need to revisit advice about diet and self-management
- prescribed doses and formulations.

If the person has reached their glycaemic and weight targets, consider continuing any medicines that have contributed to this.

Consider continuing SGLT-2 inhibitors for their cardiovascular or renal benefits, even if they do not help the person reach their glycaemic or weight targets.

Stop GLP-1 receptor agonists if:

- they do not help the person reach their glycaemic or weight targets, and
- the person does not have cardiovascular disease or early onset type 2 diabetes.

Do not offer a GLP-1 receptor agonist and a DPP-4 inhibitor together to treat type 2 diabetes.

People already on standard-release metformin

If standard-release metformin is effective and tolerated, continue its use.

If it is not tolerated, change to modified-release metformin.

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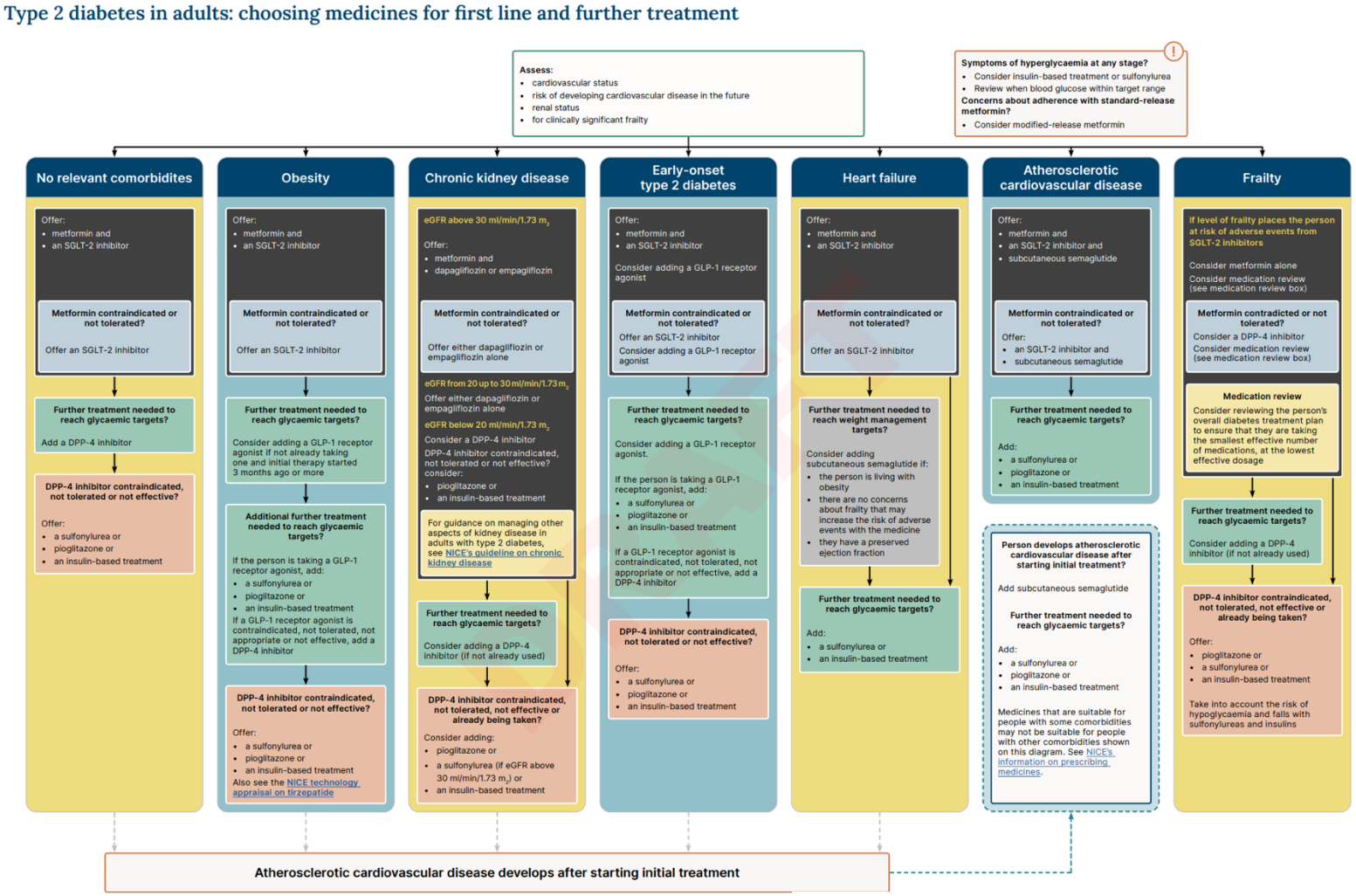
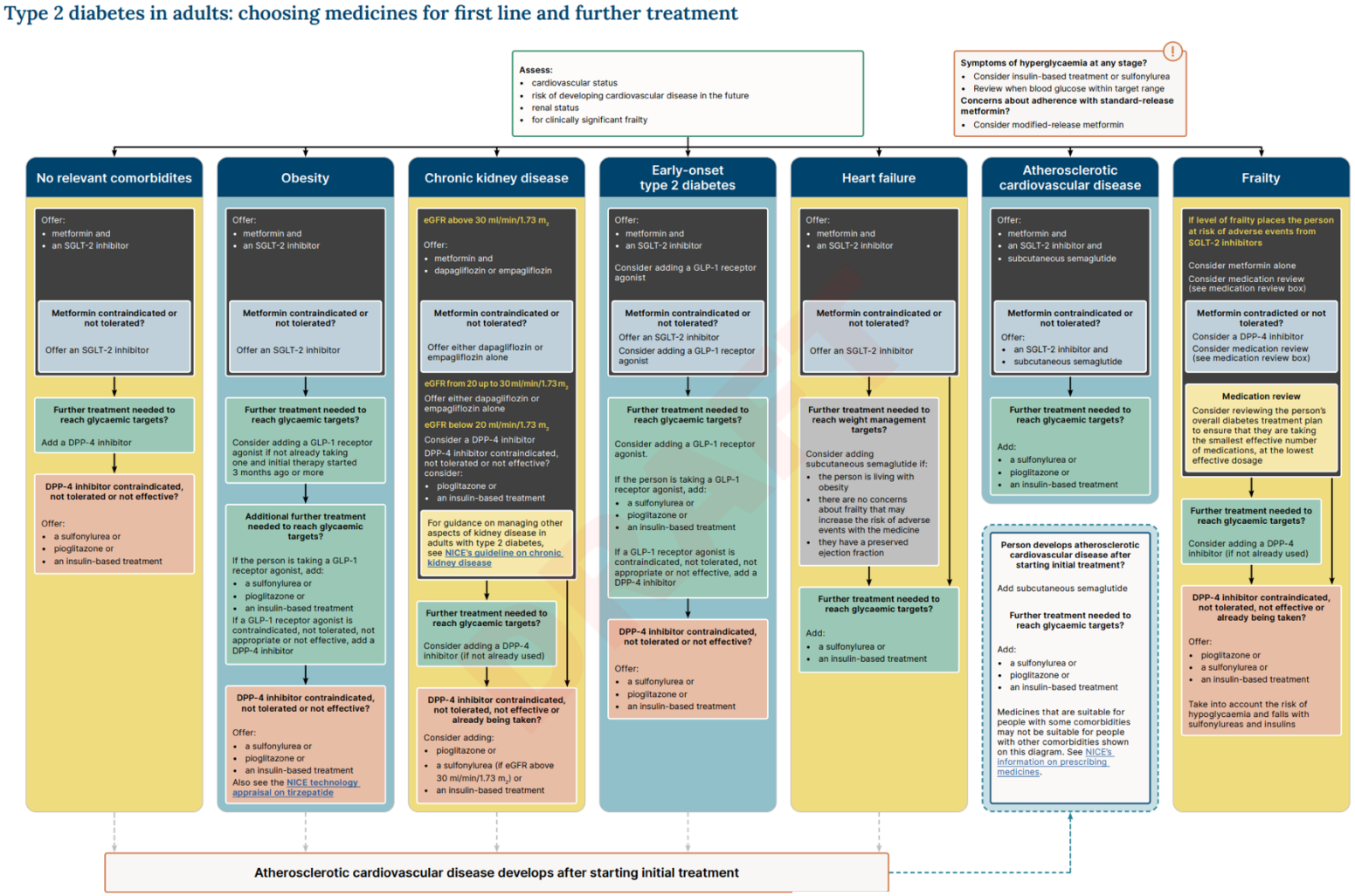
Update August 2025: Draft NICE NG28 guidelines



- SGLT-2i moved from 2nd → 1st choice treatment
- SGLT-2i: joint 1st line treatment + Metformin
- Metformin intolerant → commence SGLT-2i alone
- More patients benefit from GLP-1RA

Update August 2025: Draft NICE NG28 guidelines



- **Adults with cardiovascular disease:**
  - ➢ triple therapy including GLP-1RA
- **Adults with early onset T2D:**
  - ➢ dual therapy before GLP-1RA considered
- **People living with obesity:**
  - ➢ specific treatment combinations
- **People with DKD:**
  - ➢ tailored recommendations based on renal function
- **Adults with frailty:**
  - ➢ considered for metformin alone initially

Professor Jonathan Benger
NICE deputy chief executive and chief medical officer

“This represents a significant evolution in how we approach type 2 diabetes treatment. We're moving beyond simply managing blood sugar to taking a holistic view of a person's health, particularly their cardiovascular and kidney health"

NICE National Institute for Health and Care Excellence

Thank you

ANY QUESTIONS?