Pathway for the use of SGLT2 inhibitors in Heart Failure with Reduced Ejection Fraction (HFrEF)

Confirmed moderate or severe left ventricular systolic dysfunction on echocardiography (LVEF ≤40%)

Consider dapagliflozin or empagliflozin (specialist to specify) if symptomatic despite optimal therapy with:

- ACE inhibitor / ARB or sacubitril/valsartan ***and***
- beta blocker ***and***
- mineralocorticoid receptor antagonist (MRAs) if tolerated

Heart Failure specialists may recommend initiating in a different order according to patient tolerability – See Stage 3 of the regional Heart Failure Pathway

Consider cautions and contra-indications:

Contraindications

- Allergy to SGLT2 inhibitors
- Type 1 diabetes
- Pregnancy

Should not use if:

- Previous diabetic ketoacidosis (DKA)
- High risk of DKA e.g. previous pancreatitis, starvation – see SPC for full details: dapagliflozin / empagliflozin.
- Dapagliflozin is licensed for eGFR ≥15ml/ min but limited experience in eGFR <25 ml/min
- Empagliflozin is licensed for eGFR ≥20ml/ min

Cautions

- Previous urosepsis / recurrent genitourinary tracts infections
- Recurrent hypoglycaemia
- Peripheral vascular disease especially if previous amputation or foot ulcer – **discuss with local specialist**
- Raised haematocrit
- Severe liver impairment
- Hypotension (SBP <95 mmHg)
- Elderly patients may be at increased risk of volume depletion. Empagliflozin is not recommended if patient is ≥85 years old.

Provide Patient Information

Provide manufacturer's patient information leaflet specific for heart failure indication: dapagliflozin/ empagliflozin. This may have been supplied by the heart failure team, but it is the responsibility of the prescribing clinician to ensure the patient has received and understands this.

Sick day rules for dapagliflozin / empagliflozin: Stop during acute illness especially if too unwell to eat and drink. Stop 3 days prior to major surgery. Restart when fully recovered and eating and drinking normally.

Diabetic ketoacidosis: For patients with type 2 diabetes mellitus (T2DM), provide education on signs and symptoms of DKA and the need for ketones to be tested even if blood glucose is near normal. Importance of seeking medical help if any signs of DKA or feeling unwell.

Important side effects (not prescriptive – see individual SPCs for dapagliflozin / empagliflozin for full details including frequency):

- Hypoglycaemia when used in combination with insulin or sulfonylureas
- Increased urination and dehydration
- Genital and urinary tract infections
- Allergic reactions including rash / urticaria / angioedema
- Transient rise in creatinine during initial treatment (up to 20%).
- Diabetic ketoacidosis in patient with diabetes - discontinue immediately and DO NOT restart
- Fournier's gangrene (discontinue and initiate treatment promptly)

Adapted with kind permission from NHS Cheshire CCG, East Cheshire NHS Trust, Countess of Chester NHS Foundation Trust, Mid Cheshire Hospitals NHS Foundation trust, Cheshire and Wirral Partnership NHS Foundation Trust

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Check baseline bloods: U&Es including eGFR, FBC, LFTs and HbA1c

Assess fluid status and addition of SGLT-2 Inhibitors to diuretic therapy	
Volume status	**Changes to existing therapy**
Euvolaemic patients	Review loop diuretic dose
Volume overload	Add SGLT2 inhibitor to existing diuretics and review diuretic plan
Hypovolaemia	Correct volume depletion before adding SGLT2 inhibitor
Thiazide diuretic for hypertension	SGLT2 inhibitors may cause a modest reduction in blood pressure – Review need for thiazide. Preference should be to up-titrate ACEi/ARB/ARNI, beta blocker and MRA.
Thiazide in combination with a loop diuretic for fluid overload	Discuss with cardiologist
If in doubt, discuss with patient's heart failure specialist	

Type 2 diabetes

Addition of SGLT-2 inhibitors to other glucose lowering medication		
Criteria	**Advice**	**Diabetes Review**
HbA1c <41 (tight control) ***or*** > 2 agents	Assess risk of hypoglycaemia	Review diabetes regimen
on sulphonylureas* or insulin	High risk of hypoglycaemia	Review sulphonylurea / insulin dose before adding SGLT2 inhibitor
HbA1c 41-58 ***and*** on ≤ 2 antidiabetic agents (except sulphonylureas or insulin)	Add SGLT2 inhibitor to existing therapy	No additional requirements
HbA1c >58	Add SGLT2 inhibitor to existing therapy	Review diabetes regimen due to poor control
NOTE: If eGFR < 60ml/min there may be little effect on diabetic control therefore, dose reductions may not be necessary		
If in doubt, discuss with patient's diabetes specialist *Sulphonylureas e.g. gliclazide, glipizide, tolbutamide		

No diabetes

- If clinically appropriate start **dapagliflozin 10mg daily or empagliflozin 10mg daily (specialist to specify)**
- For use in severe liver impairment:
  - Start dapagliflozin at 5mg daily, increasing to 10mg daily if tolerated – **discuss with heart failure specialist**
  - Do **not** use empagliflozin in severe liver impairment
- Document indication for SGLT2 inhibitor clearly to prevent confusion when monitoring glycaemic targets

Monitoring

- Reassess tolerability and volume status in 2-4 weeks and consider diuretic adjustment if necessary.
- A transient rise in creatinine (up to 20%) is expected in the first 2 weeks which should not lead to premature discontinuation.
- Renal function should be checked at least 6 monthly according to heart failure guidelines accounting for other medicines the patient is taking including ACE inhibitors or MRA. See NICE NG106: Chronic Heart Failure in Adults.