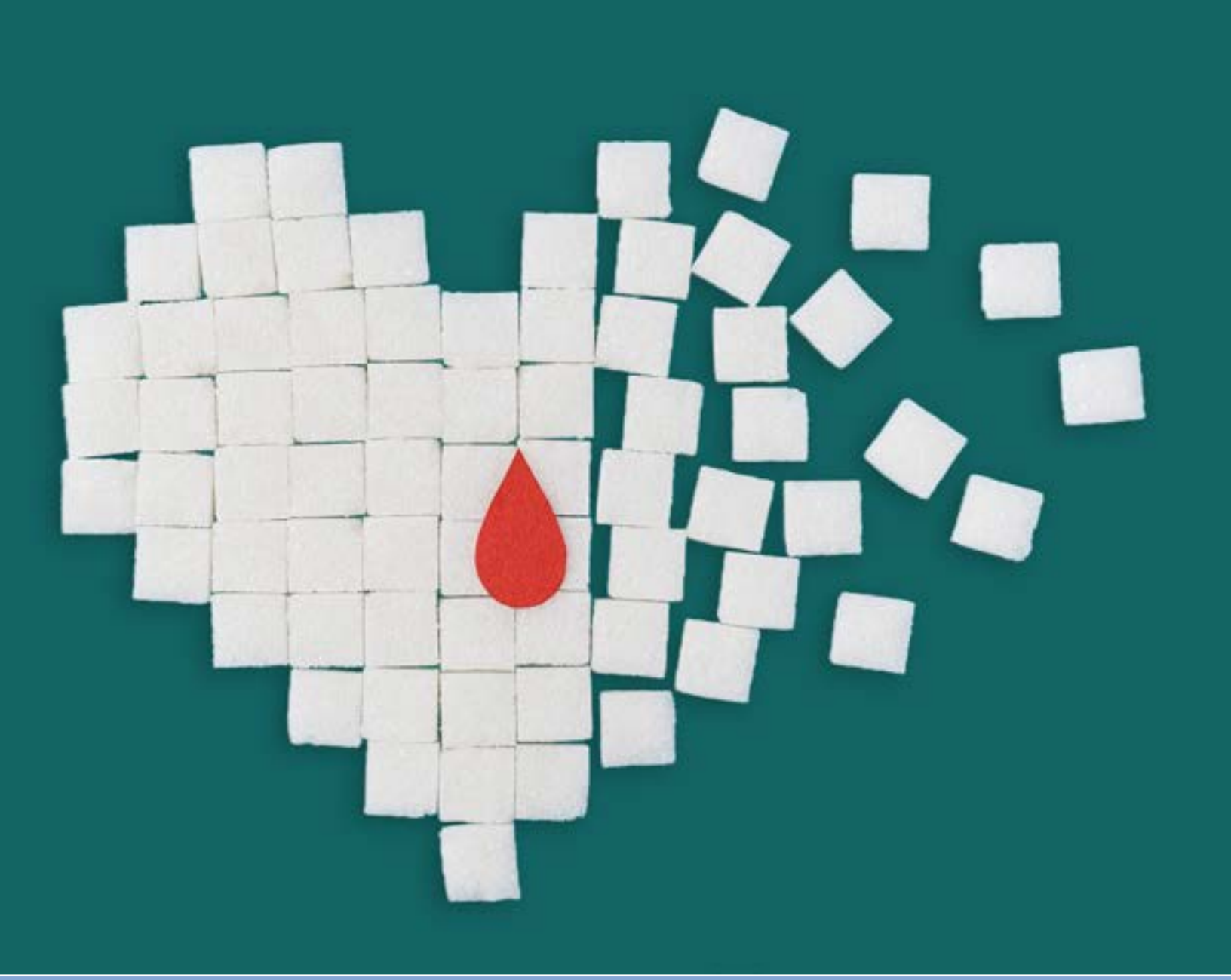

# Pharmacotherapy for Type 2 Diabetes Mellitus (T2DM)

## A VA Clinician's Guide


**U.S. Department of Veterans Affairs**

Veterans Health Administration

*PBM Academic Detailing Services*

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## Contents



This document aims to provide clarity in selecting evidence based treatment for Type 2 Diabetes Mellitus.

*These materials were developed by:*

**VA Pharmacy Benefits Management Academic Detailing Services**

## Key Messages

# Pharmacotherapy Approach for Type 2 Diabetes

Recent evidence shows a new approach is needed when treating T2DM.[1,2] SGLT-2 inhibitors and GLP-1 RA are preferred when treating patients with cardiovascular and renal disease.

## SGLT-2 inhibitors

SGLT-2 inhibitors are first-line agents for patients with ASCVD, HF, and/or CKD.[1,2] Benefits are not related to glucose lowering and should be used regardless of HbA1c level. Considerations for selecting SGLT-2 inhibitors:

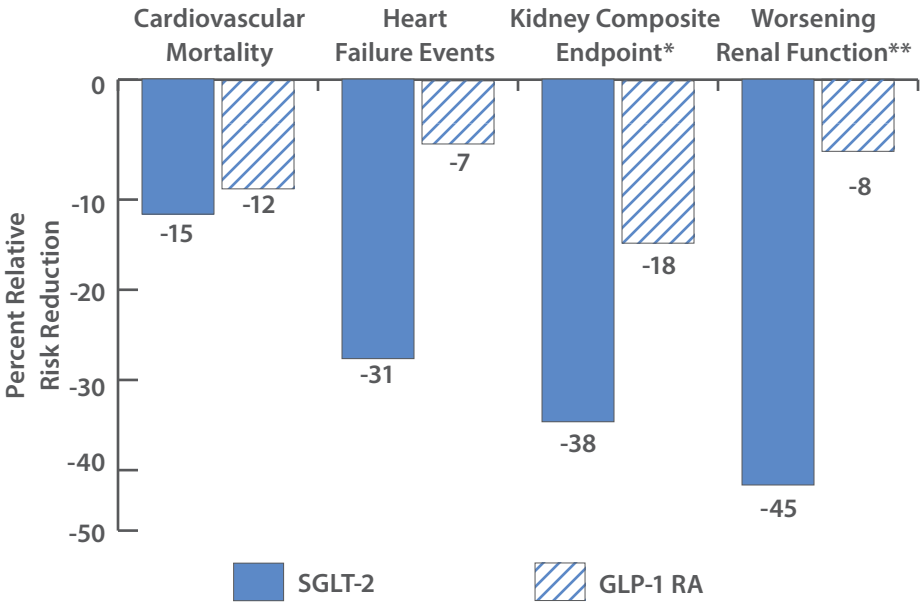
- Empagliflozin and canagliflozin lower major adverse cardiovascular events, including myocardial infarction, stroke, and cardiovascular death in patients with ASCVD.[3–13]
- All SGLT-2 inhibitors reduce HF risk and decrease HF hospitalizations.[13–18]
- Empagliflozin, canagliflozin, and dapagliflozin reduce the risk of worsening renal function (worsening eGFR, end-stage kidney disease, or renal death).[6–13,21–23]

## GLP-1 RAs

GLP-1 RAs are alternatives to SGLT-2 inhibitors. For ASCVD, the benefits are comparable between the drug classes. Renal benefits are more limited for GLP-1 RAs and costs are higher. Considerations for selecting GLP-1 RA:[1,2]

- Lower rates of major adverse cardiovascular events including myocardial infarction, stroke, and cardiovascular death in patients with ASCVD using inj. semaglutide, liraglutide, and dulaglutide.[11–15,24–32]
- A lack of evidence in lowering HF risk (neutral outcome) or decreasing HF hospitalizations.[11–16]

**Figure 1.**
**Cardiac and Renal Benefits of SGLT-2 Inhibitors and GLP-1 RAs[11]**




*Kidney composite endpoint includes new-onset macroalbuminuria, sustained doubling of serum creatinine, or a 40% decline in estimated glomerular filtration rate (eGFR), end-stage kidney disease, or renal death. **Worsening renal function includes worsening eGFR, end-stage kidney disease, or renal death.

- Inj. semaglutide reduces risk of worsening renal function[12], while liraglutide and dulaglutide reduce albuminuria.[11,13,32]
- A greater potential for weight loss than SGLT-2 inhibitors.[1,2] Weight loss can benefit glycemic control, may improve MASLD, and reduce medication burden.

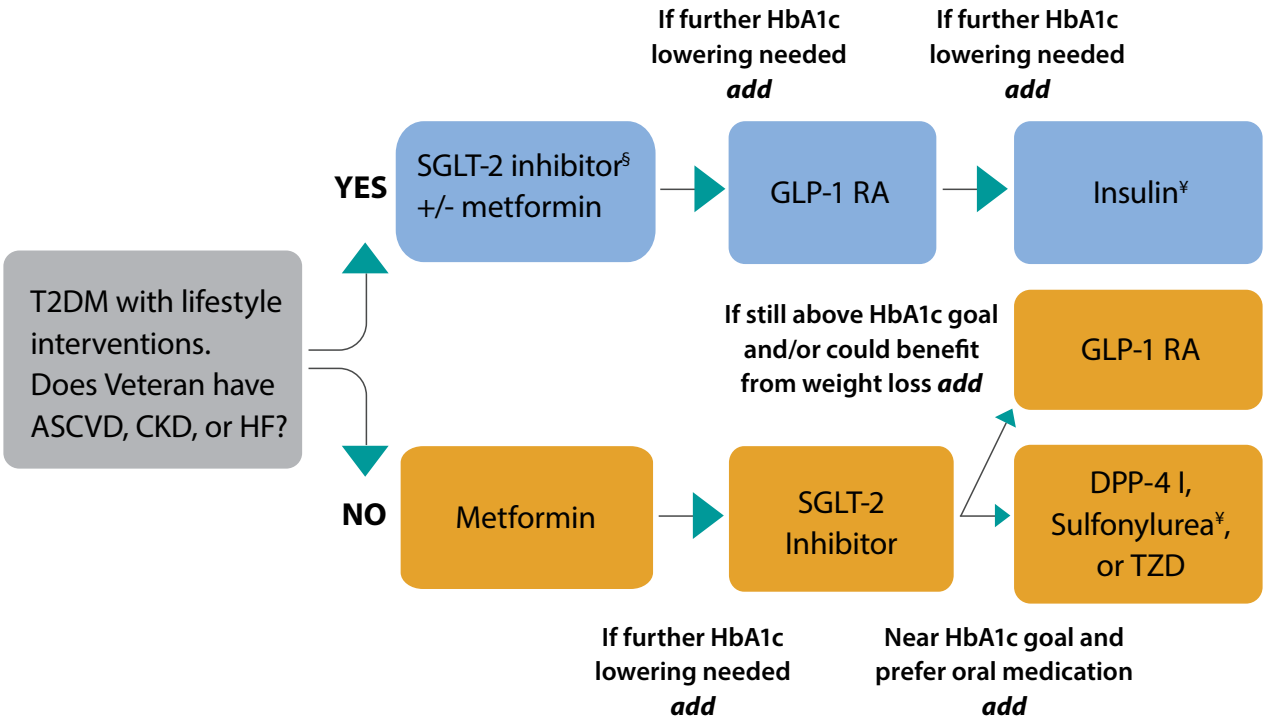
## Metformin

Metformin continues to be a mainstay of diabetes therapy and has been used for decades. It has proven efficacy in lowering HbA1c, does not cause hypoglycemia or weight gain, and is cost-effective.[1,2,33–34]

- Safe to initiate with eGFR > 45 mL/min/1.73m$^2$ and does not cause renal dysfunction.
- May continue at a reduced dose of up to 1000 mg/day in patients with eGFR 30–45 mL/min/1.73m$^2$.
- Recommend to reduce or prevent GI side effects by titrating slowly, taking with food, and using a sustained-action formulation. SA formulation has a lower rate of GI side effects (9.2% vs 19.8%) and lower rate of diarrhea (13.5% vs 3.1%) than IR formulation.
- Important to use shared decision-making to consider re-challenging with metformin in patients with a history of GI intolerance, particularly if due to rapid titration, higher dose, taking on an empty stomach, or using the IR formulation.

## Use a shared decision-making approach to determine optimal pharmacotherapy[1,2]

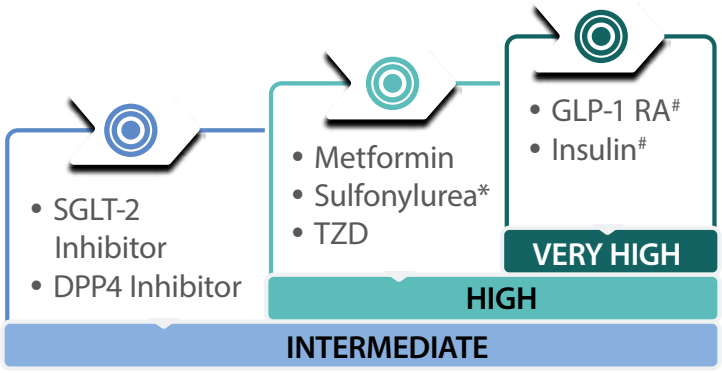
**Figure 2.**
**Glucose-lowering medication options**[*1–2]



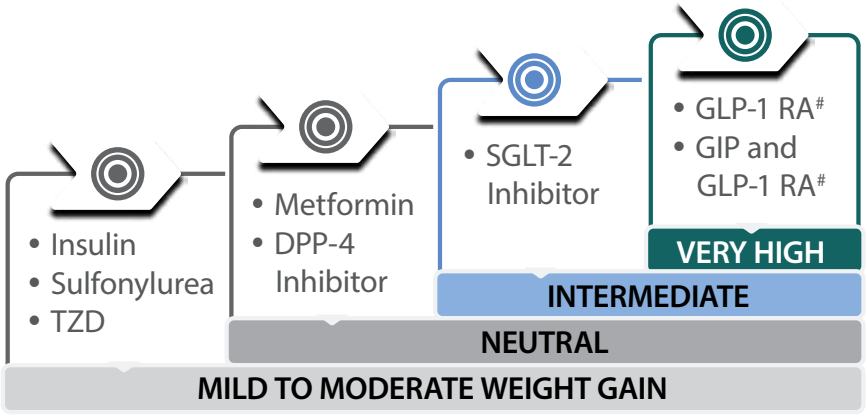

**ASCVD:** established cardiovascular disease (acute coronary syndrome or myocardial infarction, stable or unstable angina, peripheral artery disease, stroke, or any revascularization procedure). High risk indicators of ASCVD are age ≥ 55 years with 2 or more additional risk factors (obesity, hypertension, smoking, dyslipidemia, or albuminuria). **CKD:** defined as eGFR < 60mL/min or UACR > 30mg/g. **HF:** all types of heart failure are included.
*This flow diagram should be used as guidance and interpreted in the clinical context of the individual patient. Treatment may differ based on this. If HbA1c is > 10%, basal insulin can be considered sooner in the treatment algorithm. §If empagliflozin is not tolerated and Veteran has ASCVD, CKD, or HF consider injectable semaglutide ¥Use caution in elderly due to risk of hypoglycemia. **See** **Management of Type 2 Diabetes Mellitus (2023) - VA/DoD Clinical Practice Guidelines.**

**Figure 3.**
**Medications are added or adjusted based on Veteran health needs and goals[1,2]**

If **further hemoglobin A1c lowering is needed**, select based on ability to lower A1c:




If **weight loss is needed with BMI ≥ 27 kg/m²**, select based on ability of the medication to promote ***weight loss***:




*Use caution in elderly due to risk of hypoglycemia. #See VA PBM Formulary for criteria for use. https://www.va.gov/formularyadvisor/. See Table 1 for more details. HbA1c lowering: very high > 1.5%, high 1–1.5%, intermediate 0.5–1%. Weight loss: very high/high: 6–30 lb loss, intermediate: 3–5 lb loss, neutral: 2 lb or less loss or gain, mild to moderate gain: 3–8 lb.

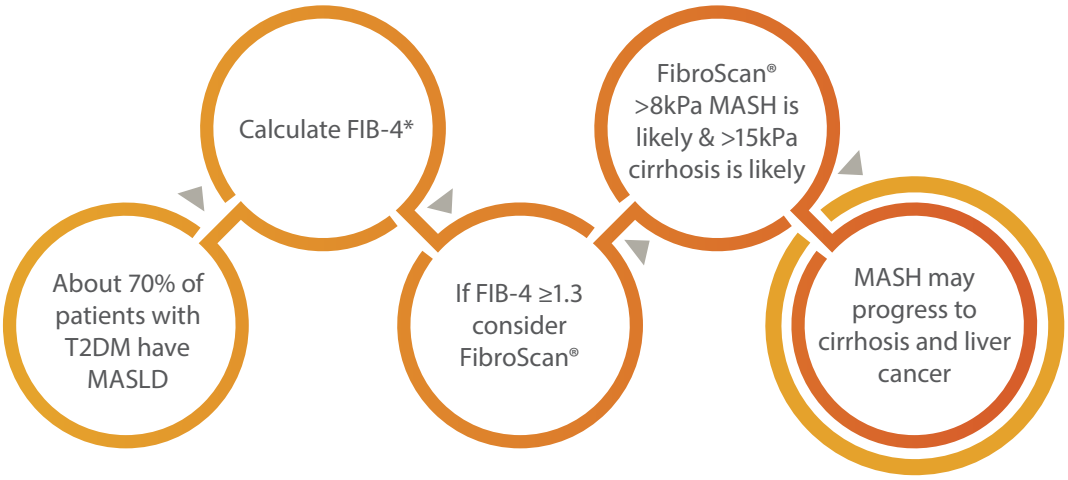
**KEY MESSAGE**

Use a SGLT-2 inhibitor in patients with T2DM with ASCVD, HF, and/or CKD.

## Type 2 Diabetes and Liver Disease

Metabolic dysfunction-associated steatotic liver disease (MASLD) is caused by excess fat in the liver. T2DM is the most impactful risk factor for development of MASLD, liver fibrosis, and liver cancer. Screening patients with metabolic risk factors (e.g., insulin resistance, obesity, or T2DM) for MASLD may identify those with metabolic dysfunction-associated steatohepatitis (MASH). Early identification of MASLD or MASH allows for interventions that may prevent future hepatic complications.

## Figure 4.
## Metabolic dysfunction associated liver disease[1,35]




*FIB-4 = Fibrosis-4 Index is a noninvasive test to assess for liver fibrosis using age, AST, ALT, platelet count: **Online Calculator**. FIB-4 is less accurate if age < 35 or ≥ 65 years. Recheck FIB-4 in patients with Type 2 diabetes every 1–2 years.

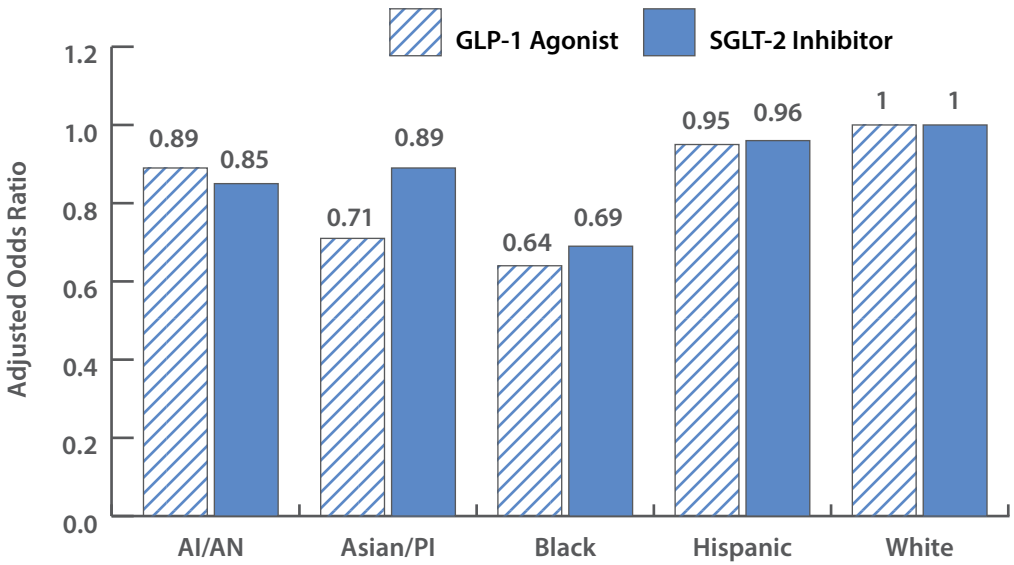
**Did You Know**

***Lifestyle modification to promote and sustain weight loss (e.g., hypocaloric diet, plant-based diet, physical activity) may help reverse and eliminate MASLD. Consider a GLP-1 RA or pioglitazone for treatment of MASH in patients with T2DM.[35]***

## Health Equity and Diabetes

The prevalence of diabetes and its complications are more common in patients who are Asian, Black, and Hispanic.[36] Studies highlight health disparities in racial and ethnic minority individuals being prescribed SGLT-2 inhibitors and GLP-1 RA at lower rates than those who are White.[37–39] Sex-related differences have also been identified, with female patients being less likely to receive these efficacious agents.[39] Veterans living in rural locations may also have less access to these agents.

## Figure 5.
## SGLT-2 Inhibitor and GLP-1 Receptor Agonist (RA) Use Based on Race/Ethnicity in VA Patients[37]




Adjusted odds ratio for a cohort of Veterans with Type 2 Diabetes in the Veteran Health Administration to be prescribed a SGLT-2 inhibitor or a GLP-1 RA. AI = American Indian; AN = Alaska Native; PI = Pacific Islander

## VHA population health tools can be used to identify treatment disparities in patients with T2DM.

- **Academic Detailing Diabetes Dashboard** includes the following metrics:
  - % of patients with T2DM prescribed SGLT-2 inhibitor and have ASCVD, HF, or CKD
  - ACE inhibitor or angiotensin receptor blocker in T2DM with HTN and/or albuminuria to slow progression of CKD

  ⇨ Data are displayed based on health equity factors of gender, race/ethnic groups, high or low poverty area, and rurality using the **Academic Detailing Diabetes Health Equity Dashboard**

- **eQM Provider Dashboard** includes the following metrics:
  - T2DM with HbA1c < 8
  - T2DM with HbA1c > 9 or missing lab
  - T2DM with blood pressure < 140/90
  - T2DM and retinal exam
  - T2DM and kidney health
  - Statin use in patients with T2DM

  ⇨ Data can be filtered based on health equity factors of age, gender, race/ethnicity groups.

**KEY MESSAGE**

Ensure evidence-based treatments for T2DM are offered to all Veterans, making efforts to reduce disparities among groups based on racial/ethnic background, sex, and location.

## Initiating insulin

When deciding to start insulin in a Veteran, it is important to consider the following factors:

- Consider GLP-1 RA before insulin if inadequate glycemic control on two or more oral medications. If HbA1c > 10% and/or having signs of catabolism, consider insulin before GLP-1 RA.[1,2]
- Cognitive function, visual acuity, and ability to detect hypoglycemia
- Willingness to do injections
- Concerns for weight gain
- Use motivational interviewing. Ask the Veteran: ***"How do you feel about taking insulin? What are your thoughts about how this will fit into your lifestyle? Will using insulin have implications for employment or military service?"*** Avoid punitive statements about insulin or imply that the patient has "failed". Diabetes is a progressive disease.

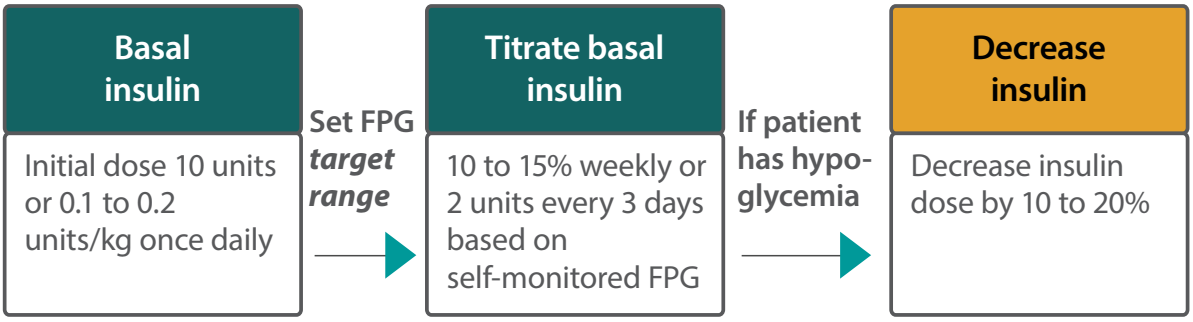
## Insulin selection

### Basal insulin[1,2]

Basal insulins include NPH, glargine, and degludec.

- Start with a basal insulin and one injection daily at bedtime.
- NPH can cause more hypoglycemia than glargine, making glargine the preferred initial basal insulin.[40–42] Insulin glargine-yfgn (Semglee®) is a biosimilar to insulin glargine (Lantus®). See **ADS Biologics/Biosimilar SharePoint** for more information.
- Glargine 300 units/mL (or U300) is a concentrated version of glargine 100 units/mL (or U100). Glargine 300 units/mL and insulin degludec have a longer duration of action than glargine 100 units/mL (over 24 hours). Both are associated with less nocturnal and less severe hypoglycemia compared to glargine 100 units/mL. In patients with recurrent hypoglycemia, despite dosage adjustments, consider a trial of insulin glargine 300 units/mL. If hypoglycemia continues, consider switching to insulin degludec.[43] See criteria for use: **https://www.va.gov/formularyadvisor/**.

**Figure 5.**
**Using basal insulin*[1,2]**



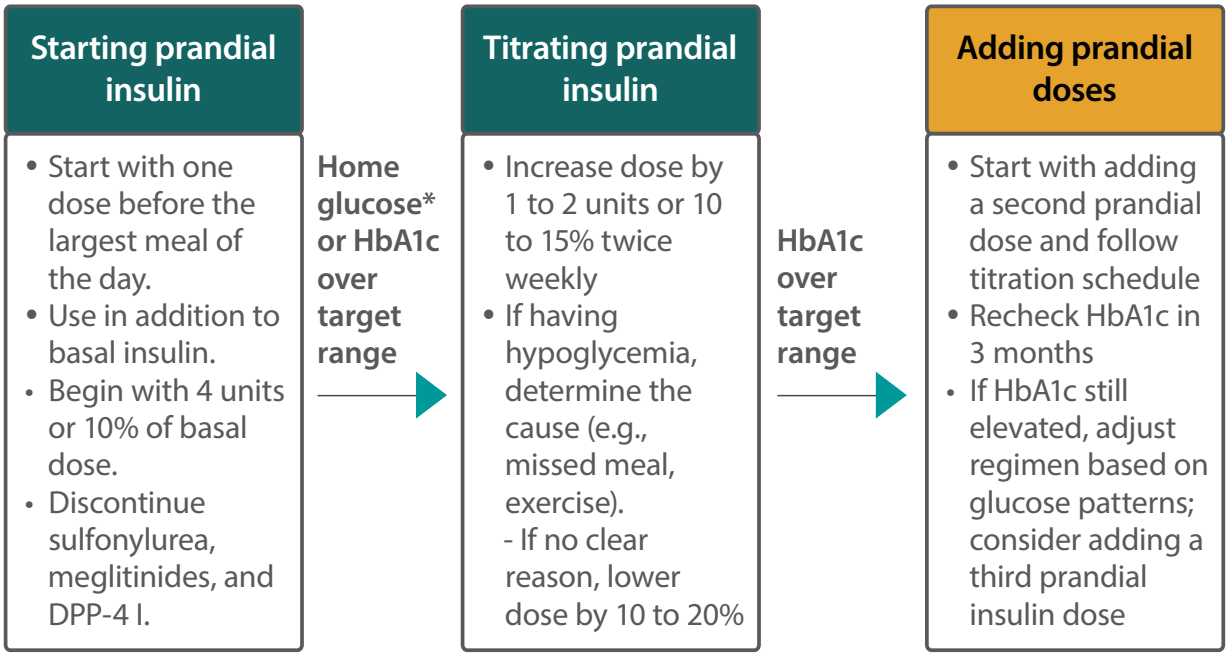

*Individualize insulin regimen based on Veteran-specific factors and glucose measurements.

### Prandial (mealtime) insulin[1,2]

Prandial insulins include aspart, glulisine, lispro, and regular.

- Consider GLP-1 RA before adding prandial insulin if inadequate glycemic control on basal insulin and one or more oral agents.[44]
- Add prandial insulin when coverage is needed for meals. Consider when HbA1c continues to be above goal, basal insulin dose is > 0.5 units/kg, or glucose readings are elevated after meals.
- Rapid acting insulins like aspart, glulisine, and lispro should be administered 0–15 minutes before meals and are preferred to insulin regular due to easier administration.
- Insulin regular should be administered 30 minutes before meals. The longer time of onset and duration may increase hypoglycemia risk.[45]

**Figure 6.**
**Using prandial insulin**




*Post-prandial glucose or next premeal glucose over target range. Adjust prandial insulin based on patterns.

### Consider using a pre-mixed insulin if the Veteran is having difficulty with multiple injections.[1,2,46]

- Insulin aspart protamine/insulin aspart 70/30 (Novolog 70/30) or insulin 70/30 NPH/REG (Novolin 70/30) – Note these are look-alike, sound-alike drugs.
- Need to have regular meal routines and not skip meals.
- Novolog 70/30 is preferred since it is administered 0–15 minutes before mealtime, while Novolin 70/30 is administered 30 minutes before eating.

## Ensure patient adherence before changing therapy.

✓ Provide instructions and demonstrate proper technique for insulin and other injectable products.

✓ Review all medications to ensure they are being used correctly before considering dose adjustments or changes in therapy.

✓ See VA Instructional Videos in the Veteran Health Library. **How to Give Yourself a Subcutaneous Injection**, **How to Use Your Insulin Pen**, **How to Use Your GLP-1 Agonist Pen**.

## Diabetes Self-Management Education and Support (DSMES)

### DSMES should be offered:[1,2]

- At diagnosis, annually, or when not meeting treatment goals.
- When complicating factors develop, or transitions in life and care occur.
- VA DSMES Resources: **Diabetes Self-Management Education and Support (DSMES) - Nutrition and Food Services (va.gov)**.

### DSMES considerations:

- Emphasize meal planning and lifestyle modifications, assess medication adherence, and optimize dose(s) at every visit. Follow up every 3–6 months to avoid therapeutic inertia.
- Check HbA1c every 3 months and adjust regimen if not in target range.
- Use patient factors and preferences to select medication(s) and glycemic treatment goals.
- Optimize regimen for cardiorenal benefit, weight loss, and reduced hypoglycemia risk.
- Use PCMHI for patients experiencing diabetes distress syndrome or other social stressors.
- Work with a Clinical Pharmacy Practitioner (CPP) to determine an optimal treatment plan.

## Blood Glucose Monitoring

### Patients Prescribed Non-insulin agents:

- Refer to the Pharmacy Benefits Management (PBM): **Dispensing guidance for Home Glucose Monitoring Test Strips in Patients with Type 2 Diabetes Who Are Not Receiving Insulin. (intranet)**

### Patients Prescribed Insulin:

- Veterans who require insulin regimens may benefit from continuous glucose monitoring (CGM), which can be offered depending on needs and resources available. Clinicians need to confirm diagnosis of diabetes and chronic insulin requirements and document this in the medical record.
- Clinicians, including staff on PACT teams, should become familiar with viewing and interpreting CGM data.
- Using shared decision making, consider CGM in Veterans requiring chronic insulin to achieve desired glycemic management targets and/or avoid hypoglycemia.
- Ensure patients are provided education. Instructional videos from VA: **VA Diabetes Care and Educational Video**.
- Glucose monitor and test strips are provided, and quantity of strips is based on the frequency for testing (e.g., calibration of CGM, confirm "high" or "low" readings).
- For more information about patient selection for CGM, refer to **Guidance on Patient Selection Criteria for Continuous Glucose Monitors**.

**KEY MESSAGE**

Consider continuous glucose monitoring in Veterans with diabetes who are on daily insulin to achieve individualized glycemic management targets and/or avoid hypoglycemia.

## Table 1.
## Pharmacotherapy for Type 2 Diabetes[1–12]

| Class | Medication | HbA1c Lowering % | CV Outcomes | | Renal Outcome | Weight Change | Hypoglycemia | Possible Side Effects/ Considerations |
|---|---|---|---|---|---|---|---|---|
| | | | ASCVD | HF | | | | |
| Biguanide | **metformin**<br>**metformin SA** | 1–1.5 | Possible benefit | * | * | Modest loss (1–2 lb loss) | No | • GI side effects common<br>• Monitor eGFR<br>• Risk for B12 deficiency<br>• Hold prior to IV contrast |
| SGLT-2 inhibitors | **empagliflozin**<br>canagliflozin | 0.5–1± | Benefit | Benefit | Benefit | Interme-diate loss (3–5 lb loss) | No | • Genital mycotic infections and UTI are rare events; risk factors are older age, uncontrolled DM, indwelling catheter, prior history, uncircumcised males.<br>• Volume depletion and hypotension<br>• Euglycemic diabetic ketoacidosis (rare)<br>• Fournier's Gangrene (rare)<br>• Hold 3 days prior to surgery |
| | dapagliflozin | | Neutral | Benefit | Benefit | | | |
| | ertugliflozin | | Neutral | Benefit | Neutral | | | |
| | bexagliflozin<br>sotagliflozin | | * | * | * | | | |
| GLP-1 receptor agonists | **inj. semaglutide†**<br>liraglutide<br>dulaglutide | 1–2 | Benefit | Neutral | Benefit | Interme-diate to very high loss (4–9 lb loss) | No | • Contraindicated in personal or family history of MTC or MEN2<br>• Avoid in gastroparesis, high risk of pancreatitis, or gallbladder disease<br>• Side effects are dose-related<br>• GI side effects common; reduced by eating smaller meals and stopping before full; avoid spicy foods<br>• Renal impairment (if volume depleted due to vomiting)<br>• Hold 1 week before anesthesia<br>• Consider for treatment of MASH (not FDA approved) |
| | exenatide<br>lixisenatide<br>oral semaglutide | | Neutral | Neutral | * | | | |

**Formulary medications in bold.** To view VA National Formulary: **https://www.va.gov/formularyadvisor/**.
*No data available. ±SGLT-2 I have reduced glucose lower effects with renal impairment. Cardiovascular and renal benefits of SGLT-2 inhibition are maintained to an eGFR of 20 mL/min/1.73m$^2$. †Semaglutide and tirzepatide show the most weight loss. **Green** = positive effect; **Yellow** = neutral effect; **Red** = negative effect.

## Table 1.
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|---|---|---|---|---|---|---|---|---|
| | | | ASCVD | HF | | | | |
| DPP-4 inhibitors | **sitagliptin**<br>linagliptin | 0.5–1 | Neutral | Neutral | * | Neutral (0–2 lb gain) | No | • Pancreatitis<br>• Hypersensitivity reactions<br>• Arthralgias<br>• Avoid use with GLP-1 RA or GIP/GLP-1 |
| | alogliptin<br>saxagliptin | | | Possible risk | | | | |
| GIP/GLP-1 RA | tirzepatide† | 2–2.5 | * | * | * | Very high loss (18–30 lb loss) | No | • Similar cautions as GLP-1 RA<br>• Might decrease efficacy of oral contraceptives, mostly in first 4 weeks, need alternative method.<br>• Consider for treatment of MASH (not FDA approved) |
| Sulfonylureas | **glipizide**<br>**glimepiride**<br>glyburide | 1–1.5 | Neutral | Neutral | Neutral | Mild to moderate gain (4–6 lb gain) | Yes | • Increased risk of hypoglycemia in elderly, renal impairment, poor intake, and/or interaction with some antimicrobials<br>• Photosensitivity and skin reactions |
| TZD | **pioglitazone** | 1–1.5 | Possible benefit | Increased risk | * | Moderate gain (6–7 lb gain) | No | • Do not use in HF or hypervolemia<br>• Increased risk of bone fractures<br>• Edema<br>• Consider pioglitazone for treatment of MASH (not FDA approved) |
| | rosiglitazone | | Possible risk | Increased risk | * | | | |
| Meglitinide | nateglinide<br>repaglinide | 0.7–1.1 | Neutral | Neutral | * | Moderate gain (3–8 lb gain) | Yes | • Reduces postprandial glucose more than sulfonylurea<br>• Take before each meal, hold if skip meal |

**Formulary medications in bold.** To view VA National Formulary: **https://www.va.gov/formularyadvisor/**.
*No data available. ±SGLT-2 I have reduced glucose lower effects with renal impairment. Cardiovascular and renal benefits of SGLT-2 inhibition are maintained to an eGFR of 20 mL/min/1.73m$^2$. †Semaglutide and tirzepatide show the most weight loss. **Green =** positive effect; **Yellow =** neutral effect; **Red =** negative effect.

## Table 2.
## Renal dosing for glucose-lowering medications[1,2,33,47–65]

| Class | Medication | Starting dose | Maximum daily dose | Action if eGFR (mL/min/1.73m²) | | | |
|---|---|---|---|---|---|---|---|
| | | | | > 45 to <60 | >30 to <45 | >15 to <30 | <15 or ESRD |
| Biguanide | **metformin**<br>**metformin SA** | 500 mg daily or BID or 500mg daily (SA) | 2,500 mg (IR)<br>2,000 mg (SA) | Max dose 2,000 mg/day<br>✓ | Max dose 1,000 mg/day*<br>•• | X | X |
| SGLT-2 inhibitors† | bexagliflozin | 20 mg daily | 20 mg daily | ✓ | ✓ | •• | X |
| | canagliflozin | 100 mg daily | 300 mg daily | 100mg max<br>•• | 100mg max<br>•• | 100mg max to 25 mL/min<br>•• | X |
| | dapagliflozin | 5 mg daily | 10 mg daily | ✓ | ✓ | ✓25 mL/min | X |
| | **empagliflozin** | 10 mg daily | 25 mg daily | ✓ | ✓ | ✓20 mL/min | X |
| | ertugliflozin | 5 mg daily | 15 mg daily | ✓ | •• | X | X |
| | sotagliflozin | 200 mg daily | 400 mg daily | ✓ | ✓ | •• | X |
| GLP-1 receptor agonists | dulaglutide | 0.75 mg weekly | 4.5 mg weekly | ✓ | ✓ | ✓ | Limited data •• |
| | exenatide | 10 mcg BID | 20 mcg BID | ✓ | ✓ | X | X |
| | exenatide XR | 2 mg weekly | 2 mg weekly | ✓ | X | X | X |
| | liraglutide | 0.6 mg weekly | 1.8 mg weekly | ✓ | ✓ | ✓ | Limited data •• |
| | lixisenatide | 10 mcg daily | 20 mcg daily | ✓ | ✓ | X | X |
| | **inj. semaglutide** | 0.25 mg weekly | 2 mg weekly | ✓ | ✓ | ✓ | Limited data •• |
| | oral semaglutide | 3 mg daily | 14 mg daily | ✓ | ✓ | ✓ | Limited data •• |
| GIP/GLP-1 RA | tirzepatide | 2.5 mg weekly | 15 mg weekly | ✓ | ✓ | ✓ | Limited data •• |
| DPP-4 inhibitors | alogliptin | 25 mg daily | 25 mg daily | 12.5 mg/day¥ •• | 12.5 mg/day¥ •• | 6.25 mg/day¥ •• | 6.25 mg/day¥ •• |
| | linagliptin | 5 mg daily | 5 mg daily | ✓ | ✓ | ✓ | ✓ |
| | saxagliptin | 2.5–5 mg daily | 5 mg daily | ✓ | 2.5 mg/day •• | 2.5 mg/day •• | 2.5 mg/day •• |
| | **sitagliptin** | 100 mg daily | 100 mg daily | ✓ | 50 mg/day •• | 25 mg/day •• | 25 mg/day •• |

**Formulary medications in bold.** **Green (✓):** no adjustment needed; **Yellow (••):** dose reduction, limited data, or use with caution; **Red (X):** avoid or contraindicated. *Do not start metformin at eGFR 30–45 ml/min but can continue at 1,000 mg daily. †SGLT-2 inhibitors have reduced effect in lowering glucose levels with renal impairment. Cardiovascular and renal benefits of SGLT-2 inhibition are maintained to an eGFR of 20 mL/min/1.73 m². ¥Renal dosing of alogliptin based on creatinine clearance not eGFR.

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| Class | Medication | Starting dose | Maximum daily dose | Action if eGFR (mL/min/1.73m²) | | | |
|---|---|---|---|---|---|---|---|
| | | | | > 45 to <60 | >30 to <45 | >15 to <30 | <15 or ESRD |
| Sulfonylureas | **glipizide** | 5 mg<br>2.5 mg in elderly | 40 mg (IR)<br>20 mg (XR) | 2.5 mg/day, slow titration •• | 2.5 mg/day, slow titration •• | •• | •• |
| | **glimepiride** | 1 – 2 mg | 8 mg | 1 mg/day, slow titration •• | •• | •• | X |
| | glyburide | 2.5 mg daily<br>Avoid in elderly | 20 mg daily or 10 mg BID | X | X | X | X |
| TZD | **pioglitazone** | 15 – 30 mg daily | 45 mg daily | ✓ | ✓ | ✓ | ✓ |
| | rosiglitazone | 4 mg daily | 8 mg daily | ✓ | ✓ | ✓ | ✓ |

**Formulary medications in bold.** **Green (✓):** no adjustment needed; **Yellow (••):** dose reduction, limited data, or use with caution; **Red (X):** avoid or contraindicated. *Do not start metformin at eGFR 30–45 ml/min but can continue at 1,000 mg daily. †SGLT-2 inhibitors have reduced effect in lowering glucose levels with renal impairment. Cardiovascular and renal benefits of SGLT-2 inhibition are maintained to an eGFR of 20 mL/min/1.73 m². ¥Renal dosing of alogliptin based on creatinine clearance not eGFR.

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## Abbreviations

**ACE:** angiotensin converting enzyme

**ASCVD:** atherosclerotic cardiovascular disease

**BID:** twice daily

**CKD:** chronic kidney disease

**DPP-4 I:** dipeptidyl peptidase-4 inhibitor

**eGFR:** estimated glomerular filtration rate

**FDA:** Food and Drug Administration

**FPG:** fasting plasma glucose

**GI:** gastrointestinal

**GIP RA:** glucose-dependent insulinotropic polypeptide receptor agonist

**GLP-1 RA:** glucagon-like peptide 1 receptor agonist

**HbA1c:** hemoglobin A1c

**HF:** heart failure

**HTN:** hypertension

**inj:** injectable

**IR:** immediate release

**IV:** intravenous

**kPa:** kilopascal

**kg:** kilogram

**lb:** pound

**$m^2$:** meters squared

**mcg:** microgram

**MASH:** metabolic dysfunction-associated steatohepatitis (formerly known as NASH)

**MASLD:** metabolic dysfunction associated steatotic liver disease (formerly known as NAFLD)

**MEN2:** multiple endocrine neoplasia syndrome type 2

**mg:** milligram

**min:** minute

**mL:** milliliter

**MTC:** medullary thyroid carcinoma

**NPH:** isophane suspension of human insulin

**PACT:** primary care aligned care team

**PCMHI:** Primary Care-Mental Health Integration

**REG:** regular insulin

**SA:** sustained action

**SGLT-2 I:** sodium-glucose cotransporter 2 inhibitor

**T2DM:** Type 2 diabetes mellitus

**TZD:** thiazolidinediones

**UACR:** urine albumin creatinine ratio

**UTI:** urinary tract infection

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May 2024 IB 10-1738, P97188 **www.va.gov**