SAS Journal of Medicine
Abbreviated Key Title: SAS J Med
ISSN 2454-5112
Journal homepage: https://saspublishers.com

OPEN ACCESS

Medicine

Prescribing in Type 2 Diabetes in Primary Care

Dr Sarah Nazir[1*], Dr. Nabila Nasir Mohyud Din[2]

[1]Family Medicine Consultant, Primary Health Care Corporation, Qatar
[2]Family Medicine Consultant, Primary Health Care Corporation, Qatar

DOI: https://doi.org/10.36347/sasjm.2026.v12i06.013 | **Received:** 03.05.2026 | **Accepted:** 16.06.2026 | **Published:** 20.06.2026

***Corresponding author:** Dr Sarah Nazir
Family Medicine Consultant, Primary Health Care Corporation, Qatar

Abstract **Review Article**

Type 2 diabetes mellitus (T2DM) is a common chronic disease managed predominantly in primary care and is associated with significant cardiovascular, renal, and metabolic complications. The expanding range of antihyperglycaemic therapies has transformed diabetes management, enabling more individualized treatment approaches while increasing the complexity of prescribing decisions. This article provides a practical overview of prescribing in T2DM within primary care, focusing on evidence-based treatment selection, medication initiation and intensification, monitoring requirements, adverse effects, and patient-centred care. Contemporary management extends beyond glycaemic control alone and increasingly emphasizes cardiovascular and renal risk reduction, weight management, avoidance of hypoglycaemia, and improvement of quality of life. Metformin remains the preferred first-line pharmacological therapy for most patients, while sodium-glucose cotransporter-2 (SGLT2) inhibitors and glucagon-like peptide-1 (GLP-1) receptor agonists play an increasingly important role due to their demonstrated cardiovascular, renal, and metabolic benefits. Other therapeutic options, including dipeptidyl peptidase-4 inhibitors, sulfonylureas, thiazolidinediones, and insulin therapy, continue to have a role in selected patient groups. The article also discusses prescribing considerations in special populations, including older adults, individuals with chronic kidney disease, and patients with established cardiovascular disease. Practical aspects of medication review, monitoring, patient education, sick-day guidance, and shared decision-making are highlighted. Through a clinical case scenario, the article illustrates the importance of tailoring treatment to individual patient characteristics, comorbidities, and preferences. Effective prescribing in T2DM requires a holistic, patient-centred approach that integrates current evidence with long-term cardiovascular, renal, and metabolic risk reduction strategies.

Keywords: Type 2 diabetes mellitus, Primary care, Prescribing, Metformin, SGLT2 inhibitors, GLP-1 receptor agonists, Cardiovascular disease, Chronic kidney disease, Glycaemic control, Patient-centred care.

INTRODUCTION

Type 2 diabetes mellitus (T2DM) is one of the most common chronic conditions managed in general practice and is associated with significant cardiovascular, renal, and metabolic morbidity. The expanding range of antihyperglycemic therapies has transformed diabetes care, offering clinicians opportunities to individualize treatment according to patient characteristics, comorbidities and therapeutic priorities. However, the increasing complexity of prescribing can present challenges for primary care clinicians, particularly when balancing glycemic control with weight management, cardiovascular protection, renal preservation, hypoglycemia risk, and polypharmacy. This article reviews practical prescribing in T2DM within primary care, focusing on evidence-based treatment selection, medication initiation and intensification, monitoring requirements, adverse effects, and patient-centered care.

Understanding treatment goals in type 2 diabetes

Management of T2DM aims not only to reduce hyperglycemia but also to minimize longterm complications and improve quality of life. Historically, treatment centered predominantly on glycated hemoglobin (HbA1c) targets; however, contemporary diabetes care increasingly prioritizes cardiovascular and renal outcomes.

Individualized HbA1c targets should be agreed collaboratively with patients. NICE generally recommends an HbA1c target of 48 mmol/mol (6.5%) for patients managed with lifestyle measures or drugs not associated with hypoglycemia, and 53 mmol/mol (7.0%) for those taking medications such as sulfonylureas.

Nevertheless, targets should be adjusted according to frailty, life expectancy, comorbidities, and risk of adverse effects.

Clinicians should consider following when making prescribing decisions:

- Cardiovascular disease
- Chronic kidney disease
- Obesity and weight management
- Risk of hypoglycemia
- Frailty and older age
- Patient preference
- Cost-effectiveness
- Medication adherence

Lifestyle modification remains fundamental and includes dietary intervention, physical activity, smoking cessation, and weight reduction.

First-line pharmacological therapy Metformin

Metformin remains the first-line pharmacological treatment for most patients with T2DM due to its efficacy, safety profile, low risk of hypoglycemia, and cardiovascular benefit.

Metformin reduces hepatic gluconeogenesis and improves insulin sensitivity. It typically lowers HbA1c by approximately 10–15 mmol/mol and is weight neutral or modestly weight reducing.

Prescribing considerations

Metformin is usually initiated at 500 mg once daily with food and titrated gradually to minimize gastrointestinal adverse effects. Modified release formulations may improve tolerability.

Common adverse effects include:

- Nausea
- Diarrhea
- Abdominal discomfort
- Metallic taste

Long-term therapy may contribute to vitamin B12 deficiency; periodic monitoring should therefore be considered, particularly in patients with anemia or neuropathy.

Renal function must be assessed before initiation and monitored regularly. Dose reduction is required when estimated glomerular filtration rate (eGFR) falls below 45 mL/min/1.73m², and metformin should usually be discontinued if eGFR falls below 30 mL/min/1.73m² due to the risk of lactic acidosis.

Second-line treatment options

If HbA1c targets are not achieved with metformin and lifestyle intervention, additional therapy should be considered. Drug selection increasingly depends on comorbidities rather than glucose lowering alone.

Sodium-glucose cotransporter-2 inhibitors

Empagliflozin, Dapagliflozin and Canagliflozin inhibit renal glucose reabsorption, promoting glycosuria.

SGLT2 inhibitors have become central to diabetes management because of substantial cardiovascular and renal benefits demonstrated in large outcome trials.

Advantages

- Weight reduction
- Blood pressure lowering
- Cardiovascular risk reduction
- Heart failure benefit
- Slowing progression of chronic kidney disease
- Low risk of hypoglycemia

Adverse effects

- Genital fungal infections
- Urinary tract infections
- Volume depletion
- Rare diabetic ketoacidosis (including euglycemic DKA)

Patients should receive sick-day guidance and be advised to withhold treatment during acute illness, dehydration, or perioperative periods.

SGLT2 inhibitors are particularly valuable in patients with:

- Established cardiovascular disease
- Heart failure
- Chronic kidney disease
- Obesity

Glucagon-like peptide-1 receptor agonists

Semaglutide, Dulaglutide and Liraglutide mimic endogenous incretin hormones, increasing glucose-dependent insulin secretion while suppressing glucagon release and delaying gastric emptying.

These agents are highly effective for both glycemic control and weight loss. Benefits

- Significant HbA1c reduction
- Weight reduction
- Low hypoglycemia risk
- Cardiovascular benefit in selected agents'

Adverse effects

- Nausea
- Vomiting
- Diarrhea
- Gallbladder disease
- Rare pancreatitis

Gradual dose escalation improves gastrointestinal tolerability

NICE recommends GLP-1 receptor agonists in selected patients, particularly where obesity is a

significant concern, or insulin therapy may otherwise be required.

Dipeptidyl peptidase-4 inhibitors

Sitagliptin and Linagliptin enhance endogenous incretin activity.

These agents are generally well tolerated and weight neutral but provide more modest HbA1c reduction compared with GLP-1 receptor agonists or SGLT2 inhibitors.

Clinical role

DPP-4 inhibitors may be useful in:

- Older adults
- Frail patients
- Individuals' intolerant of other therapies
- Patients at higher hypoglycemia risk

Linagliptin is advantageous in renal impairment as dose adjustment is not usually required.

Sulfonylureas

Gliclazide stimulates pancreatic insulin secretion.

Although inexpensive and effective at lowering glucose, sulfonylureas carry a significant risk of hypoglycemia and weight gain.

Important prescribing considerations

- Increased hypoglycemia risk in older adults
- Caution in renal impairment
- Driving implications should be discussed
- HbA1c reduction may diminish over time

Sulfonylureas are increasingly used selectively, often where rapid glycemic improvement is required, or cost limits alternative therapies.

Thiazolidinediones

Pioglitazone improves insulin sensitivity. Advantages

- Durable glycemic effect
- Low hypoglycemia risk
- Potential benefit in fatty liver disease

Adverse effects and cautions

- Weight gain
- Fluid retention
- Heart failure exacerbation
- Increased fracture risk
- Possible association with bladder cancer

Pioglitazone should therefore be avoided in patients with heart failure or significant fracture risk.

Insulin therapy in primary care

Insulin remains an important treatment option when oral and injectable non-insulin therapies fail to achieve adequate glycemic control.

Indications include:

- Symptomatic hyperglycemia
- Markedly elevated HbA1c
- Catabolic symptoms
- Pregnancy
- Contraindications to other therapies

Initiating insulin

Basal insulin is commonly initiated first, often using once-daily long-acting insulin.

Insulin Glargine and Insulin Detemir are frequently used.

Starting doses are usually 10 units daily or 0.1–0.2 units/kg/day, with gradual titration based on fasting glucose measurements.

Key prescribing issues

- Education regarding hypoglycemia recognition and management
- Driving regulations
- Injection technique
- Blood glucose monitoring
- Weight gain
- Safe disposal of sharps

Complex insulin regimens may require specialist diabetes team involvement.

Prescribing in special populations older adults and frailty

Older adults are particularly vulnerable to medication, adverse effects, and hypoglycemia. Relaxed HbA1c targets are often appropriate.

Avoiding overtreatment is essential. Sulfonylureas and insulin should be used cautiously in frail individuals.

Simplified regimens can improve adherence and safety.

Chronic kidney disease

Renal impairment significantly influences prescribing choices.

SGLT2 inhibitors now play an important renoprotective role, although eGFR thresholds apply. Dose adjustments may be required for metformin and several DPP-4 inhibitors.

Cardiovascular disease

Patients with established cardiovascular disease benefit particularly from SGLT2 inhibitors and selected GLP-1 receptor agonists with proven cardiovascular outcome benefits.

Cardiovascular risk reduction should also include:

- Blood pressure optimization
- Lipid management
- Smoking cessation
- Antiplatelet therapy where indicated

Monitoring and medication review

Regular medication review is critical in diabetes management.

Monitoring should include:

- HbA1c
- Renal function
- Liver function where relevant
- Weight
- Blood pressure
- Adverse effects
- Adherence
- Hypoglycemia episodes

Medication burden should be reviewed periodically to minimize polypharmacy and improve patient understanding.

Structured diabetes education programmes can improve self-management and engagement.

Sick-day rules and patient counselling

Patient education is essential for safe prescribing.

Patients should receive advice regarding:

- Sick-day medication management
- Hypoglycemia treatment
- Foot care
- Driving regulations
- Alcohol intake
- Lifestyle modification

Certain medications may require temporary cessation during acute illness to reduce the risk of dehydration or acute kidney injury.

The "SADMANS" mnemonic is frequently used to identify medications that may require withholding during acute illness:

- Sulfonylureas
- ACE inhibitors
- Diuretics
- Metformin
- ARBs
- NSAIDs
- SGLT2 inhibitors

Clinical case scenario

Mrs. Ahmed is a 56-year-old woman with T2DM diagnosed 8 years ago. She attends routine diabetes review. Her HbA1c is 78 mmol/mol despite maximum tolerated metformin therapy. Her body mass index is 34 kg/m², blood pressure is 138/84 mmHg and eGFR is 78 mL/min/1.73m². She has a history of myocardial infarction 2 years previously.

She expresses frustration regarding progressive weight gain and wishes to avoid insulin therapy if possible.

In this scenario, treatment intensification should consider both glycemic control and cardiovascular risk reduction. An SGLT2 inhibitor such as empagliflozin would provide cardiovascular benefit alongside modest weight loss and HbA1c reduction. A GLP-1 receptor agonist such as semaglutide may also be appropriate due to its substantial weight loss effects and cardiovascular outcome data.

Shared decision-making is important. Discussion should include administration route, side effects, cost implications, weight goals, and patient preference. Mrs. Ahmed opts to commence semaglutide alongside ongoing lifestyle intervention and follow-up HbA1c review in 3 months.

This case highlights the shift from purely glucose-centered prescribing towards holistic cardiovascular and metabolic risk management.

Key points

- Management of T2DM should be individualized according to comorbidities, frailty, cardiovascular risk, and patient preference.
- Metformin remains first-line pharmacological therapy for most patients.
- SGLT2 inhibitors provide important cardiovascular and renal protection in addition to glucose lowering.
- GLP-1 receptor agonists are highly effective for weight reduction and glycemic improvement.
- Avoiding hypoglycemia is particularly important in older adults and frail patients.
- Regular medication review and patient education are essential for safe prescribing.

REFERENCES

1. National Institute for Health and Care Excellence. Type 2 diabetes in adults: management (NG28). London: NICE; updated 2024.
2. Davies MJ, Aroda VR, Collins BS *et al.,* Management of hyperglycemia in type 2 diabetes, 2024 consensus report by the ADA and EASD. *Diabetologia*. 2024; 67:1021–1057.
3. UK Prospective Diabetes Study (UKPDS) Group. Intensive blood-glucose control with sulphonylureas or insulin compared with conventional treatment. *Lancet*. 1998; 352:837–853.
4. Zinman B, Wanner C, Lachin JM *et al.,* Empagliflozin, cardiovascular outcomes and mortality in type 2 diabetes. *New England Journal of Medicine*. 2015; 373:2117– 2128.
5. Marso SP, Daniels GH, Brown-Frandsen K *et al.,* Liraglutide and cardiovascular outcomes in type 2 diabetes. *New England Journal of Medicine*. 2016; 375:311–322.
6. Gerstein HC, Colhoun HM, Dagenais GR *et al.,* Dulaglutide and cardiovascular outcomes in type 2 diabetes (REWIND trial). *Lancet*. 2019; 394:121–130.
7. Diabetes UK. Healthcare professionals' resources and patient education materials.
8. Royal College of General Practitioners. RCGP Curriculum Topic Guides: Diabetes Care.