Diabetes Quick Reference Guide

Diabetes and Prediabetes Diagnosis

Prediabetes	Type 2 DM
Hba1c between 5.7% – 6.4%, *or*	A hemoglobin A1c (HbA1c) level of 6.5% or higher, *or*
Fasting blood glucose between 100 – 125 mg/dl, *or*	A fasting plasma glucose (FPG) level of 126 mg/dL or higher, *or*
An Oral Glucose Tolerance Test 2 hour blood glucose between 140 mg/dl – 199 mg/dl	A 2-hour plasma glucose level of 200 mg/dL or higher during a 75-g oral glucose tolerance test (OGTT), *or*
	A random plasma glucose of 200 mg/dL or higher in a patient with classic symptoms of hyperglycemia or hyperglycemic crisis

Diabetic Management Checklist

Screening/ Management Measure	Target	Frequency	Next Step if uncontrolled/positive finding
HgbA1c test	<7.0%	Every 6 months if controlled Every 3 months if poorly controlled	• Lifestyle modification • Escalate dosing of anti-diabetic medications • Referral to endocrinologist or pharmacist if HgbA1c >9% • CM/BH referral as indicated
Blood Pressure control	BP <140/90 or <130/80 in select pts with CVD, CAD, or ASCVD risk > 15%*	Annually if normal	• Lifestyle modification • Home BP monitoring • If no CKD, use ACE/ARB, diuretic, or CCB • If CKD present: ACE/ARB • If resistant hypertension or progressive kidney disease, consider referring to Nephrology or clinical pharmacy program
Lipid Management	LDL is <100 mg/dL. With CV disease, target is <70 mg/dL.	Annually	• Lifestyle modification • Statin therapy
Monitoring for Diabetic Kidney Disease (eGFR and UACR)	eGFR >100 UACR <30 mg/g C	Annually (Consider semiannually if EGFR <60 or UACR >30 mg/g of C)	• ACE/ARB if eGFR <60 or UACR >30 • Consider use of SGLT-2i or GLP-1 RA • Intensify anti-diabetic medications to optimize glycemic control • Dietary intake of ~0.8 g protein/kg weight per day • Consider Nephrology referral
Retinopathy Screening	Absence of retinopathy or macular edema	If retinopathy or macular edema present, annual dilated eye exam or retinal photography. If not present, screen every 2 years.	• Annual evaluation by ophthalmologist if retinopathy or macular edema present. Screening can be performed in PCP office with a retinal camera; optometry clinic or ophthalmology clinic.
Foot Exam	No ulcerations or fungal infections, 2+ Pedal pulses, Normal sensory response with monofilament	Annually	• Referral to podiatrist for management of any abnormalities • Refer for Ankle Branchial Index (ABI) if Peripheral Arterial Disease (PAD) suspected

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Diabetes Medication and Management Pathway

Goal: Cardiorenal Risk Reduction in High-Risk Patients with Type 2 Diabetes (in addition to comprehensive CV risk management)*

+ASCVD†

Defined differently across CVOTs but all included individuals with established CVD (e.g., MI, stroke, any revascularization procedure). Variably included: conditions such as transient ischemic attack. unstable angina, amputation, symptomatic or asymptomatic coronary artery disease.

+Indicators of high risk

While definitions vary, most comprise ≥55 years of age with two or more additional risk factors (including obesity, hypertension, smoking, dyslipidemia, or albuminuria)

+HF

Current or prior symptoms of HF with documented HFrEF or HFpEF

+CKD

eGFR <60 mL/min per 1.73 m^2 OR albuminuria (ACR ≥3.0 mg/mmol [30 mg/g]). These measurements may vary over time; thus, a repeat measure is required to document CKD.

ASCVD/Indicators of High Risk

GLP-1 RA# with proven CVD benefit

• • EITHER/OR • •

SGLT2i§ with proven CVD benefit

If A1C above target

- For patients on a GLP-1 RA, consider adding SGLT2i with proven CVD benefit or vice versa
- TZD^

+HF

SGLT2i§ with proven HF benefit in this population

+CKD (on maximally tolerated dose of ACE/ARB)

SGLT2i§ with primary evidence of reducing CD progressionrequired to document CKD.

Use SGLT2i in people with an eGFR ≥20 mL/min per 1.73 m^2; once initiated should be continued until initiation of dialysis or transplantation

• • OR • •

GLP-1 RA with proven CVD benefit if SGLT2i not tolerated or contraindicated

If A1C above target, for patients on SGLT2i, consider incorporating a GIP-1 RA or vice versa

If additional cardiorenal risk reduction or glycemic lowering needed

Adapted from: https://diabetesjournals.org/view-large/figure/4482963/dc23S009f3.tif

* 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 packground 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 reducation 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 demonstate their efficacy in reducing the risk of composite MACE, CV death, allcause 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, stoke, and renal endpoints in individuals with T2D with established/high risk of CVD.

Goal: Achievement and Maintenance of Glycemic and Weight Management Goals

Glycemic Management:

Choose approaches that provide the efficacy to achieve goals:

- Metformin OR Agent(s) including COMBINATION therapy that provide adequate EFFICACY to achieve and maintain treatment goals
- Consider avoidance of hypoglycemia a priority in high-risk individuals

In general, higher efficacy approaches have greater likelihood or achieving glycemic goals

Efficacy for glucose lowering

Very High
Dulaglutide (high dose), Semaglutide, Tirzepatide

Insulin
Comhination Oral Combination Injectable (GLP-1 RA/Insulin

...

High
GLP-1 RA (not listed above), Metformin, SGLT2i, Sulfonylurea, TZD

...

Intermediate
DPP-41

Achievement and Maintenance of Weight Management Goals:

Set individualized weight management goals

General lifestyle advice: medical nutrition therapy/eating patterns/physical activity	**Intensive evidence-based** structured weight management
Consider medication for weight loss	**Consider metabolic surgery**

...

When choosing glucose-lowering therapies:
Consider regimen with high-to-very-high dual glucose and weight efficacy GIP-1 RA or vice versa

Efficacy for weight loss

Very High
Semaglutide, Tirzepatide

...

High
Dulaglutide, Liraglutide

...

Intermediate
GLP-1 RA (not listed above), SGLT2i

...

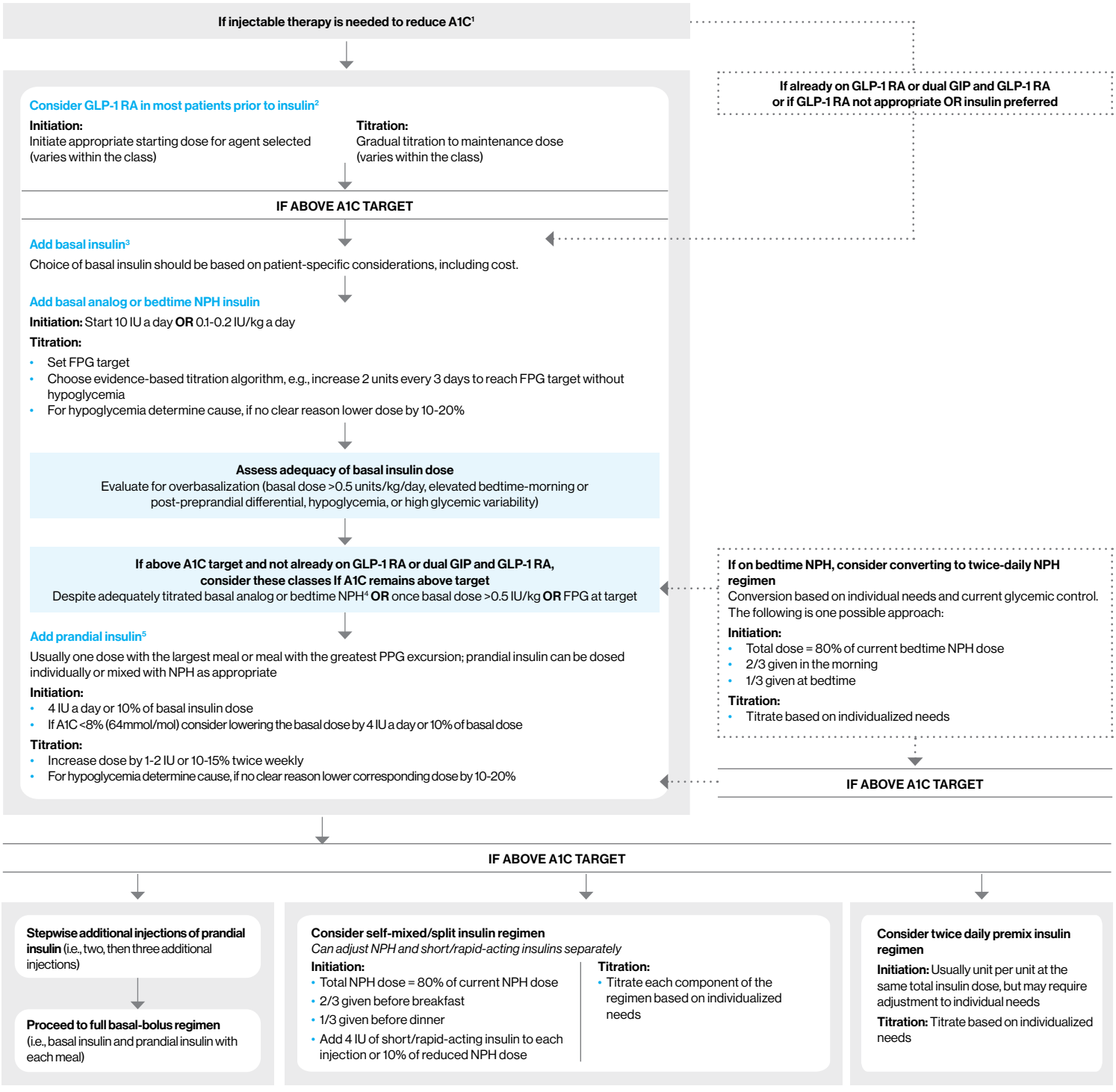
Neutral:
DPP-4i, Metformin

If A1C above target

Identity barriers to goals:

- Consider DSMES referral to support self-efficacy in achievement of goals
- Consider technology (e.g., diagnostic CGM) to identify therapeutic gaps and tailor therapy
- Identify and address DOH that impact achievement of goals

Pathway to Reduce A1C via Insulin or Injectable Therapy



1. Consider insulin as the first injectable if evidence of ongoing catabolism, symptoms of hypoglycemia are present, when A1C levels (>10% [86 mmol/mol]) or blood glucose levels (≥300 mg.dK [16.7 mmol/L]) are very high, or a diagnosis of type 1 diabetes is a possibility
2. When selecting GLP-1 RA, consider: patient preference, A1C lowering, weight-lowering effect, or frequency of injection. If CVD, consider GLP-1 RA with proven CVD benefit.
3. For patients on GLP-1 RA and basal insulin combination, consider use of a fixed-ration combination product (iDegLira or iGlarLixi).
4. Consider switching from evening NPH to a basal analog if the patient develops hypoglycemia and/or frequently forgets to administer NPH with an AM dose of a long-acting basal insulin
5. If adding prandial insulin to NPH, consider initiation of a self-mixed or premixed insulin regimen to decrease the number of injections required

Diabetes Medications

Medication Class	Compound(s)	Trade Names	Available Dosages	Starting dose*	Maximum daily dose
Biguanides	Metformin	Glucophage Riomet	500 mg (IR)	500 mg qd	2,000 mg
			850 mg (IR)		2,550 mg
			1,000 mg (IR)		2,000 mg
		Fortamet Glucophage XR Glumetza Riomet ER	500 mg (ER)	500 mg qd	2,000 mg
			750 mg (ER)		1,500 mg
			1,000 mg (ER)		2,000mg
Sulfonylureas (2nd generation)	Glimepiride	Amaryl	1 mg, 2 mg, 4 mg	1 mg qd	8 mg
	Glipizide	Glucotrol	5 mg, 10 mg (IR)	5 mg qd	40 mg (IR)
		Glucotrol XL	2.5 mg, 5 mg, 10 mg (XL)	2.5 mg qd	20 mg (XL)
	Glyburide	Glynase PresTabs	1.5 mg, 3 mg, 6 mg**	1.5 mg qd	12 mg**
Thiazolidinediones	Pioglitazone	Actos	15 mg, 30 mg, 45 mg	15 mg qd	45 mg
Meglitinides (glinides)	Nateglinide	Starlix	60 mg, 120 mg	60 mg tid ac	360 mg
	Repaglinide	Prandin	0.5 mg, 1.0 mg, 2 mg	0.5 mg tid ac	16 mg
DPP-4 inhibitors	Alogliptin	Nesina	6.25 mg, 12.5 mg, 25 mg	25 mg qd	25 mg
	Saxagliptin	Onglyza	2.5 mg, 5 mg	5 mg qd	5 mg
	Linagliptin	Trajenta	5 mg	5 mg qd	5 mg
	Sitagliptin	Januvia	25 mg, 50 mg, 100 mg	100 mg qd	100 mg
SGLT2 inhibitors	Ertugliflozin	Steglatro	5 mg, 15 mg	5 mg qd	15 mg
	Dapagliflozin	Farxiga	5 mg, 10 mg	5 mg qd	10 mg
	Empagliflozin	Jardiance	10 mg, 25 mg	10 mg qd	25 mg
	Canagliflozin	Invokana	100 mg, 300 mg	100 mg qd	300 mg
	Bexagliflozin	Brenzavvy	20 mg	20 mg qd	20 mg
GLP-1 RAs	Exenatide (ER)	Bydureon Bcise	2 mg powder for suspension or pen	2 mg qweek	2 mg†
	Exenatide	Byetta	5 mcg, 10 mcg pen	5 mcg bid	20 mcg
	Dulaglutide	Trulicity	0.75 mg, 1.5 mg, 3.0 mg, 4.5 mg,	0.75 mg qweek	1.5 mg†
	Semaglutide	Ozempic	0.25 mg. 0.5 mg, 1 mg, 2 mg pens	0.25 mg qweek	2 mg†
		Rybelsus	3 mg, 7 mg, 14 mg (tablet)	3 mg qday	14 mg
	Liraglutide	Victoza	0.6 mg, 1.2 mg, 1.8 mg		1.8 mg
GIP and GLP-1 RA	Tirzepatide	Mounjaro	2.5 mg/0.5 mL; 5 mg/0.5 mL; 7.5 mg/0.5 mL; 10 mg/0.5 mL; 12.5 mg/0.5 mL;15 mg/0.5 mL	2.5 mg qweek	15 mg†

continued >

* No renal/hepatic impairment

** Micronized

† Administered once weekly

Diabetes Medications (continued)

Medication Class	Efficacy	Hypoglycemia	Weight impact	Cardiovascular Effects		Renal Effects		Additional Considerations
				MACE	Heart Failure	Progression of DKD	Dosing considerations	
Biguanides	High	No	Neutral (potential for modest loss)	Potential benefit	Neutral	Neutral	• Contraindicated with eGFR <30 mL/min/1.73m²	• Gastrointestinal side effects common (diarrhea, nausea) • Potential for B12 deficiency
Sulfonylureas (2nd generation)	High	Yes	Gain	Neutral	Neutral	Neutral	• Glyburide: not recommended in CKD • Glipizide and glimepiride: initiate conservatively to avoid hypoglycemia	• FDA Special Warning on increased risk of cardiovascular mortality based on studies of an older sulfonylurea (tolbutamide)
Thiazolidinediones	High	No	Gain	Potential benefit – pioglitazone	Increased risk	Neutral	• No dose adjustment required • Generally not recommended in renal impairment due to potential for fluid retention	• FDA Black Box: Congestive heart failure • Fluid retention (edema, heart failure) • Benefit in NASH • Risk of bone fractures • Bladder cancer
DPP-4 inhibitors	Intermediate	No	Neutral	Neutral	Potential risk: saxagliptin	Neutral	• Renal dose adjustment required (sitagliptin, saxagliptin, alogliptin); can be used in renal impairment • No dose adjustment required for linagliptin	• Potential risk of acute pancreatitis • Joint pain • Bullous pemphigoid
SGLT2 inhibitors	Intermediate – High	No	Loss (intermediate)	Benefit: empagliflozin†, canagliflozin	Benefit: empagliflozin†, canagliflozin, dapagliflozin‡ ertugliflzoin	Benefit: empagliflozin, canagliflozin, dapagliflozin	• Renal dose adjustment required (canagliflozin, dapagliflozin, empagliflozin) • In patients with CKD, use in people with eGFR >20 mL/min/1.73 m2. Continue until initiation of dialysis or transplant	• DKA risk (all agents, rare in T2DM) • Genitourinary infections • Risk of volume depletion, hypotension • Risk of Fournier's gangrene
GLP-1 RAs	High – very high	No	Loss (intermediate to very high)	Neutral: exenatide once weekly	Neutral	Benefit (driven by albumin uria outcomes): dulaglutide, liraglutide, semaglutide (SQ)	• Renal dose adjustment required (exenatide) • Caution when initiating or increasing dose due to potential risk of acute kidney injury in patient with renal impairment reporting severe adverse GI reactions	• FDA Black Box: Risk of thyroid C-cell tumors (semaglutide, liraglutide, dulaglutide, exenatide extended release) and Multiple Endocrine Neoplasia Syndrome (MEN) Type 2 • Gastrointestinal side effects common (nausea, vomiting, diarrhea) • Acute pancreatitis risk
GIP and GLP-1 RA	Very high	No	Loss (very high)	Under investigation	Under investigation	Under investigation	• No dose adjustment • Caution when initiating or increasing dose due to potential risk of acute kidney injury in patient with renal impairment reporting severe adverse GI reactions	• FDA Black Box: Risk of thyroid C-cell tumors (semaglutide, liraglutide, dulaglutide, exenatide extended release) and Multiple Endocrine Neoplasia Syndrome (MEN) Type 2 • Gastrointestinal side effects common (nausea, vomiting, diarrhea) • Acute pacreatitis risk
Insulin	High to very high	Yes	Gain	Neutral	Neutral		• Lower insulin doses required with a decrease in eGFR; titrate per clinical response	• Injection site reactions • Higher risk of hypoglycemia with human insulin (NPH or premixed formulations) vs. analogs

Type 2 Diabetes and Heart Disease (Atherosclerotic Vascular Disease (ASCVD) and Heart Failure (HF))

- **Ideally, risk factors for ASCVD and Heart Failure should be assessed annually, using prognostic tools such as the ASCVD Risk Calculator (available online at tools.acc.org/ASCVD-Risk-Estimator-Plus). The 10 year risk of a first ASCVD event used to guide interventions.**
- Screening
  - Testing is indicated for typical/atypical chest pain, signs/symptoms of other vascular disease, or an abnormal ECG.
  - Exercise testing with/without echocardiography is the recommended initial test. Pharmacologic stress echo or nuclear imaging is indicated for those who are unable to exercise or have significant resting ECG abnormalities.
  - **Routine screening for ASCVD with CT calcium scores/ CT angiography in asymptomatic high risk patients is not recommended.**
- Antiplatelet Therapy
  - **Aspirin therapy (75–162 mg/day) may be considered as a primary prevention strategy in those with diabetes who are at increased cardiovascular risk, after a comprehensive discussion with the patient on the benefits versus the comparable increased risk of bleeding.**
  - ASA (75-162 mg/d) maybe used for secondary prevention, in diabetic patients with known ASCVD (prior MI/stroke).
  - Clopidogrel may be used in patients with known ASA allergy.
- **In patients with known or multiple risk factors for ASCVD and/or CKD, an SGLT-2i or a GLP-1 RA should be part of the medication regimen.**
- Heart Failure
  - In patients with HF (with or without diabetes), a SGLT-2i may be used to reduce risk of worsening heart failure and cardiovascular death and improve symptoms, physical limitations, and quality of life
  - Contraindicated:
    - DPP-4 Saxagliptin is associated with an increased risk hospitalization for HF and is contraindicated in HF patients.
    - Thiazolidinediones are also contraindicated in patients with heart failure
    - Metformin should be avoided in unstable or hospitalized individuals with heart failure

Referrals

Potential indications for referral for specialty care include:

- Endocrinology
  - **For A1c > 9, despite 6 months of adherent therapy**
  - Recurrent hypoglycemia
  - Continuous subcutaneous insulin therapy
- Cardiology
  - For **treatment of concomitant cardiac disease (CAD, HF)**, and orthostatic hypotension.
  - Optimize treatment of lipid disorders
- Nephrology
  - To clarify the cause of CKD, manage the complications of CKD, and All Stage 4 CKD (eGFR <30)
  - KidneyIntelX™ medium or high risk score[1]
    - Diagnostic blood test that predicts risk of progressive decline in kidney function in patients with type 2 diabetes and existing Diabetic Kidney Disease at stages 1-3 (eGFR 30-59 or UACR ≥ 30).

continued >

For help accessing any of the above resources, please call MSHP at **877-234-6667** or email **mshp@mountsinai.org**.

1 KidneyIntelX is one screening option for early diagnosis and prevention for CKD. KidneyIntelX is based on technology developed by Mount Sinai faculty and licensed to RenalytixAI, Inc. Mount Sinai faculty members are co-founders and equity owners in the company the Icahn School of Medicine at Mount Sinai has equity ownership in RenalytixAI plc. NYS CLIA ID: 33D2156875.

2 https://www.amcp.org/sites/default/files/2019-03/Practice%20Advisory%20on%20CDTM%202.2012_0.pdf

WE FIND A WAY

Mount Sinai Health Partners

Mount Sinai Health Partners
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New York, NY 10017

MSHS Disease Management Services include:

Certified Diabetic Education Disease Management Team (Wellness Coaches):
Certified Diabetes Educators (CDEs) practice at the top of their license. They can help manage patients with both a diagnosis of diabetes and associated comorbidities such as heart failure. CDEs are embedded in primary and specialty care.

Clinical Pharmacy:

- Pharmacists are a key part of the care team for chronic disease management including diabetes, heart failure, and COPD.
- They are credentialed providers that can prescribe and adjust medications through the Collaborative Drug Treatment Model.[2]

REFERRALS TO PHARMACISTS:

- Uncontrolled diabetes and associated co-morbid conditions
- Polypharmacy, Medication Reconciliation and Medication Adherence

Ambulatory Care Management and Home Health Optimization Program:

REFERRAL CRITERIA may include those with:

- Complex psychosocial challenges impeding with optimal diabetic care.
- Multiple no-shows, unexplained non-adherence to medications, testing or treatment
- Demonstrated difficulty managing symptoms and/or disease processes (including those newly diagnosed)

HOW TO REFER CARE MANAGEMENT AND/OR HOME HEALTH OPTIMIZATION PROGRAM:

- Use the **MSHP Care Management Referral in Epic (order #391414)**
- Email **mshpcmreferral@mountsinai.org** or call **212-241-7228**

MSHP Care Management prioritizes patients in our MSSP and Healthfrst contracts and those patients with Medicaid

Behavioral Health
Patients should be screened annually for depression using the PHQ-2/PHQ-9 and referred to behavioral health services through their current care pathway depending on their clinic.

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