Referral to Specialists: A Nephrology Perspective

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MCT2D
MICHIGAN COLLABORATIVE FOR TYPE 2 DIABETES

Disclosures

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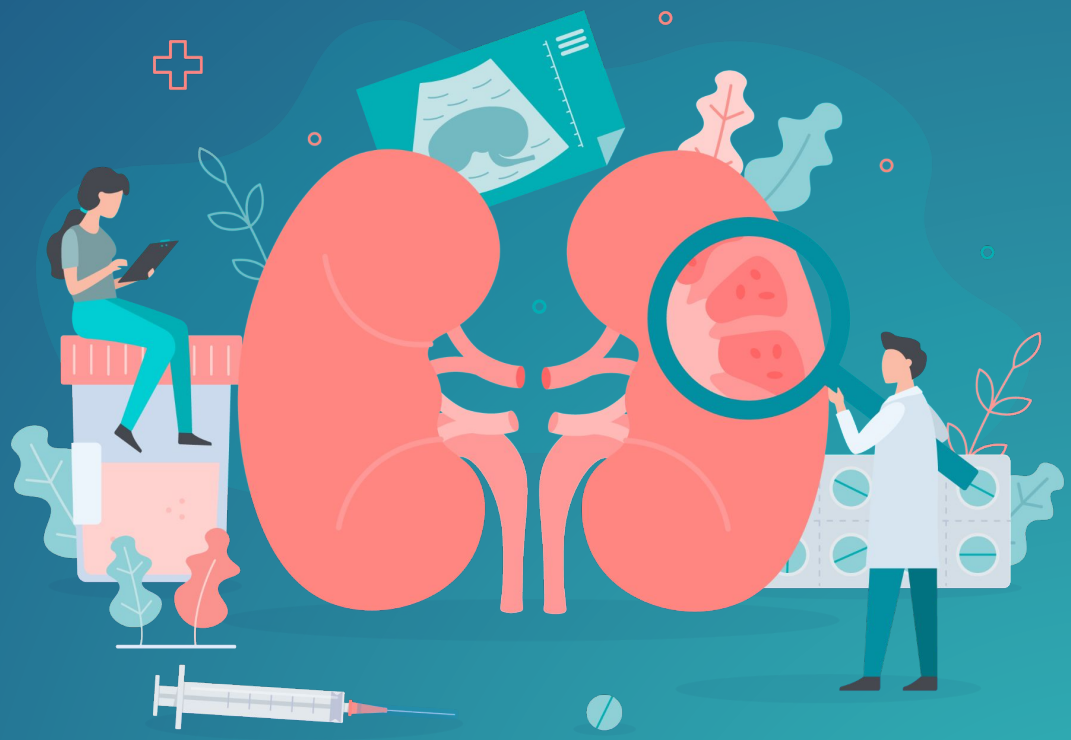


Objectives

- Describe guidelines for nephrology referral
- Identify patients requiring urgent referral
- Describe initial work-up in anticipation of possible nephrology referral

What Do The Guidelines Say?

Kidney Disease Improving Global Outcomes (2012)

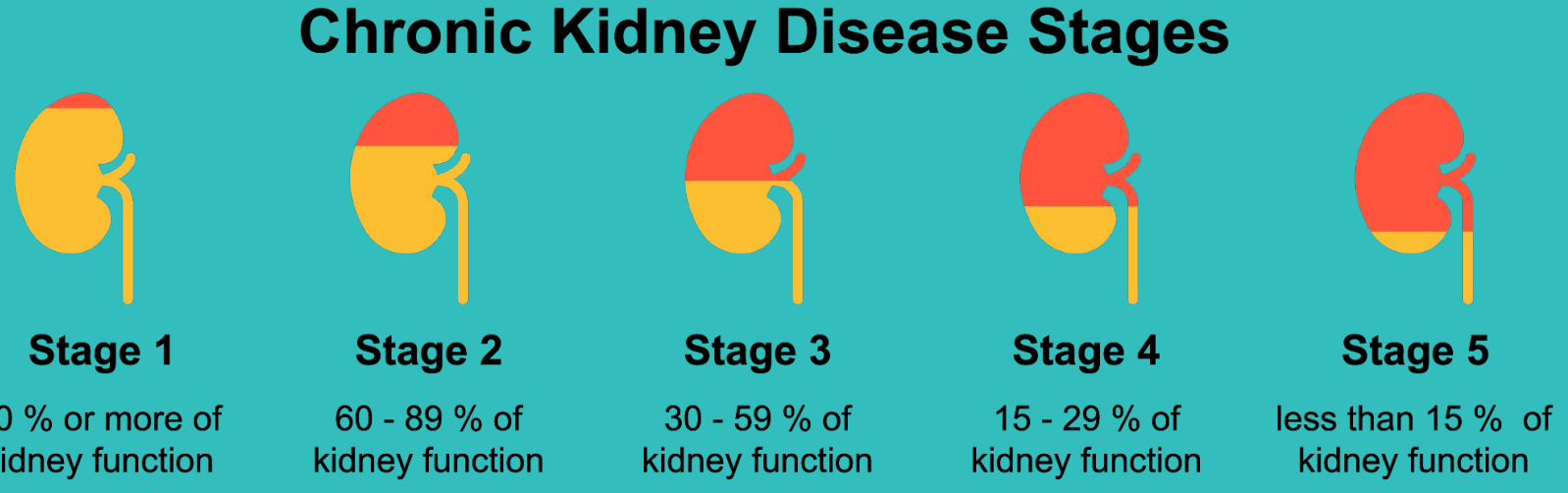
We recommend referral for people with CKD and (1B):

- AKI or abrupt sustained fall in GFR
- GFR <30 mL/min/1.73m^2
- Consistent finding of significant albuminuria (UACR ≥300)
- Progression of CKD
- Urinary red call casts, RBC >20 per HPF sustained and not readily explained
- CKD and HTN refractory to treatment with 4 or more agents
- Persistent abnormalities of serum potassium
- Recurrent or extensive nephrolithiasis
- Hereditary kidney disease

"GFR <30 (Stage 4 or Worse CKD)"

- Unless limited life expectancy or patient preference, all patients with eGFR <30 should undergo nephrology evaluation
  - Importance of education and preparation for endstage kidney disease (ESKD)

- BUT: no need to wait until patients reach eGFR 30!!
  - Proliferation of evidence that CKD progression can be slowed or even halted at earlier stages ➡ ACEI/ARB, SGLT2 inhibitors, MRA's, possibly GLP1's



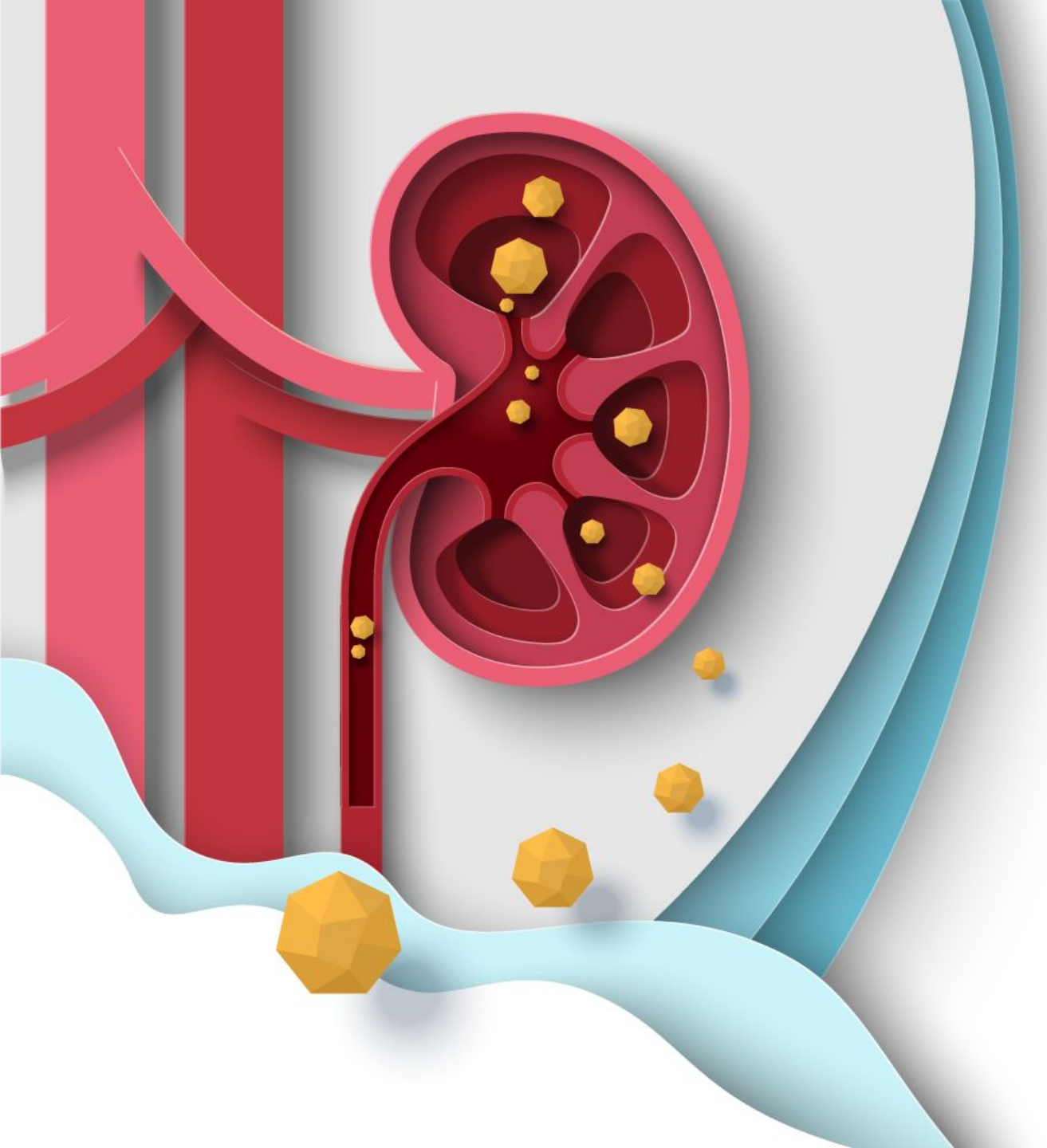
"Consistent Significant Albuminuria"

Clinical Significance of Albuminuria

- Diagnostic: Part of criteria for CKD
- Prognostic: Increasing albuminuria is associated with greater risk of:
  - Kidney disease progression
  - Acute kidney injury
  - Cardiovascular disease
  - All-cause mortality
- Therapeutic: Target for therapy initiation, titration and monitoring for response

CKD “Heat Map”

GFR categories (ml/min/ 1.73 m²) Description and range				Persistent albuminuria categories Description and range		
				A1	A2	A3
				Normal to mildly increased	Moderately increased	Severely increased
				<30 mg/g <3 mg/mmol	30–300 mg/g 3–30 mg/mmol	>300 mg/g >30 mg/mmol
	G1	Normal or high	≥90		Monitor	Refer*
	G2	Mildly decreased	60–89		Monitor	Refer*
	G3a	Mildly to moderately decreased	45–59	Monitor	Monitor	Refer
	G3b	Moderately to severely decreased	30–44	Monitor	Monitor	Refer
	G4	Severely decreased	15–29	Refer*	Refer*	Refer
	G5	Kidney failure	<15	Refer	Refer	Refer



"Progression of CKD"

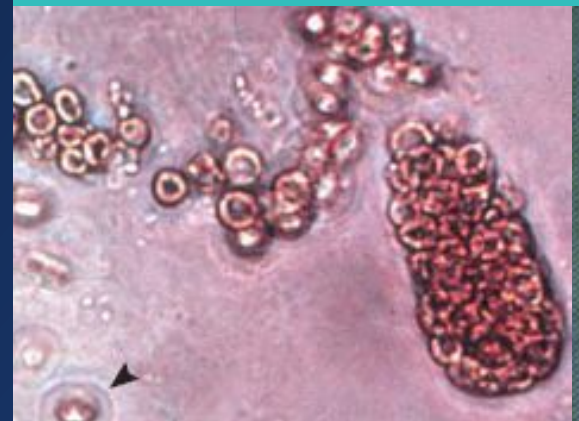
- Decline in GFR category: Fall of 25% or more
- Rapid progression of CKD: Sustained decline of >5mL/min/1.73m^2 per year
- Note: small fluctuations in GFR are common and not necessarily indicative of progression

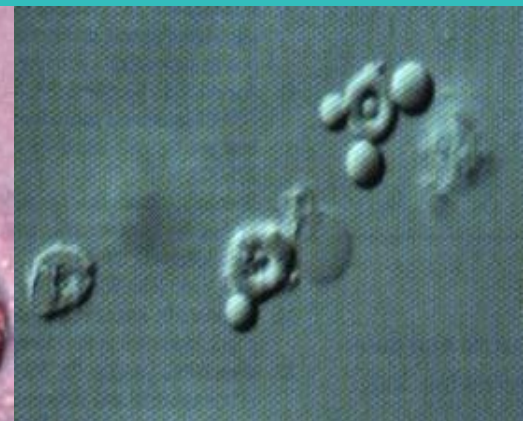
“Hematuria”

- Urologic vs nephrologic causes
  - Glomerular hematuria: dysmorphic RBC’s or RBC casts

- Renal “Red Flags”
  1. Proteinuria (new finding)
  2. HTN (new or worsening)
  3. Renal insufficiency (new or worsening)

- Can be serious (e.g. acute glomerulonephritis) or benign (e.g. thin basement membrane nephropathy)
  - In absence of above 3 red flags, management is almost always focused on careful observation





Additional Thoughts (My Opinion)

- **No such thing as “too early” referral!**
- Low threshold for referral if the etiology of CKD is unclear
  - Increasing recognition of genetic diseases and greater availability of genetic testing

When Should a Referral be Urgent?

- Rapidly declining kidney function (either AKI or progressive CKD)
- Suspected glomerulonephritis: time is tissue!
- How? Direct contact!
  - Michigan Medicine (M-Line): 800-962-3555

How to Help Nephrology to Help Your Patient

Initiate the work-up:

- Confirm abnormal labs (rule out false positives)
- Review medication exposures (including non-prescription)
- Check urinalysis
- Consider renal ultrasound

“False Positive” Creatinine Elevations
(not due to decreased GFR)

1. Decreased tubular secretion: Cr clearance is comprised of both Cr filtration (GFR) and tubular Cr secretion (normally 15%)
    - More pronounced in CKD
    - Meds: **Bactrim** (trimethoprim), H2 blockers (cimetidine)

2. Increased Cr generation/release: rhabdomyolysis

3. Increased Cr ingestion: cooked meat, creatine supplements

4. Lab assay interference: cefoxitin/cefazolin

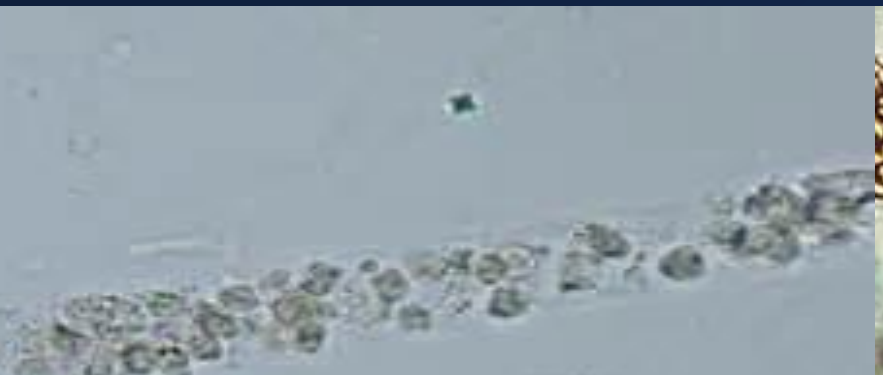
Alternatives to SCr

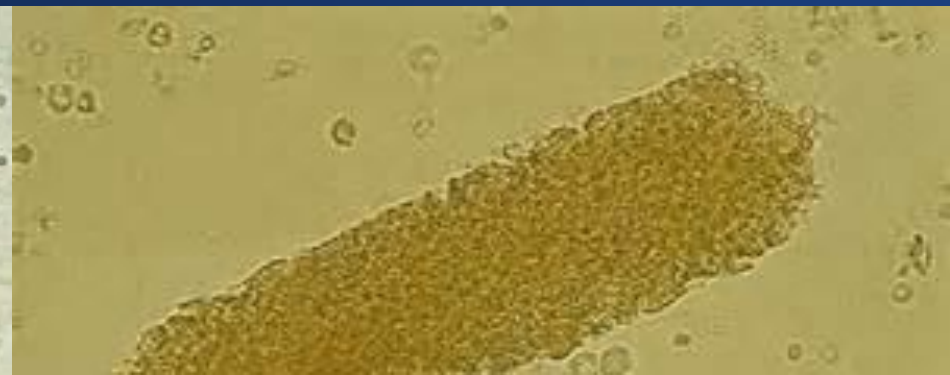
- **Cystatin C** https://www.kidney.org/professionals/kdoqi/gfr_calculator
  - Creatinine comes from muscle, and may not be good representation of GFR at extremes of muscle mass
  - Cystatin C comes from all nucleated cells, thus not dependent on muscle mass
- Timed urine collections for Cr clearance
- GFR measurement (iothalamate or iohexol plasma disappearance)
- Indications for additional testing: suspected inaccuracy of SCr-based eGFR *and* clinical need-to-know (e.g. potential kidney transplant donor)

Check a Urinalysis

- When evaluating for CKD/AKI, <u>always</u> obtain a **urinalysis**!
  - The “non-invasive kidney biopsy”
  - Directs additional work-up and referral urgency

- Pyuria: infection, allergic interstitial nephritis, glomerulonephritis
- Hematuria + proteinuria: glomerulonephritis
- Granular casts: ATN





Kidney Ultrasound

- Any history suggestive of urinary retention
  - Can rule out obstruction
  - Combine with formal post-void residual testing
- Size and morphology (e.g. echogenicity) of kidneys may be helpful in determining chronicity
- Evaluate for specific conditions such as polycystic kidney disease

Role of the Nephrologist

- One-time evaluation
  - Nephrologist as cheerleader (or enforcer)
  - **Graduation from nephrology!**

- Longitudinal management
  - Partner in monitoring and medical management
  - Management of more advanced complications (e.g. EPO therapy for anemia of CKD)
  - Preparations for end-stage kidney disease (e.g. dialysis education, transplant referral)

Questions?

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Referral to Specialists: Endocrinology

Dr. Jennifer Iyengar
Clinical Assistant Professor
MM Metabolism, Endocrinology, and Diabetes

Disclosures

- None

When should you refer?

When should you refer?

Uncontrolled Type 2 diabetes with A1c >9-10%


Hey Doc,
My aunt has type 2 diabetes that isn't well controlled. Can she get an appointment to see you?

T2DM referral

70yo with T2DM, HL, hypothyroidism, and depression.

Dx'd T2DM 5-6 years ago. P/w AMS and glucose >1200. No further details available on hospitalization. Started on basal insulin. Never been on oral agents. A1cs consistently 10+%. She does not monitor her BG at home.

Family: No history of DM

Social: Smokes 2ppd since age 15. No ETOH/drugs. Family nearby assists with driving, cooking.

T2DM referral

Medications: Basaglar 22units QHS, Fluoxetine 20mg per day

Allergies: NKDA

Exam: 49.4kg (108lbs), BMI 18.9, no acanthosis, exam otherwise unremarkable.

Labs: POC A1c >14%

When is T2DM not T2DM?

Dx’d age 65, low BMI (18.9), autoimmune hypothyroidism, severely uncontrolled despite basal insulin (0.44u/kg), never tried on orals.

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GAD65 Ab assay

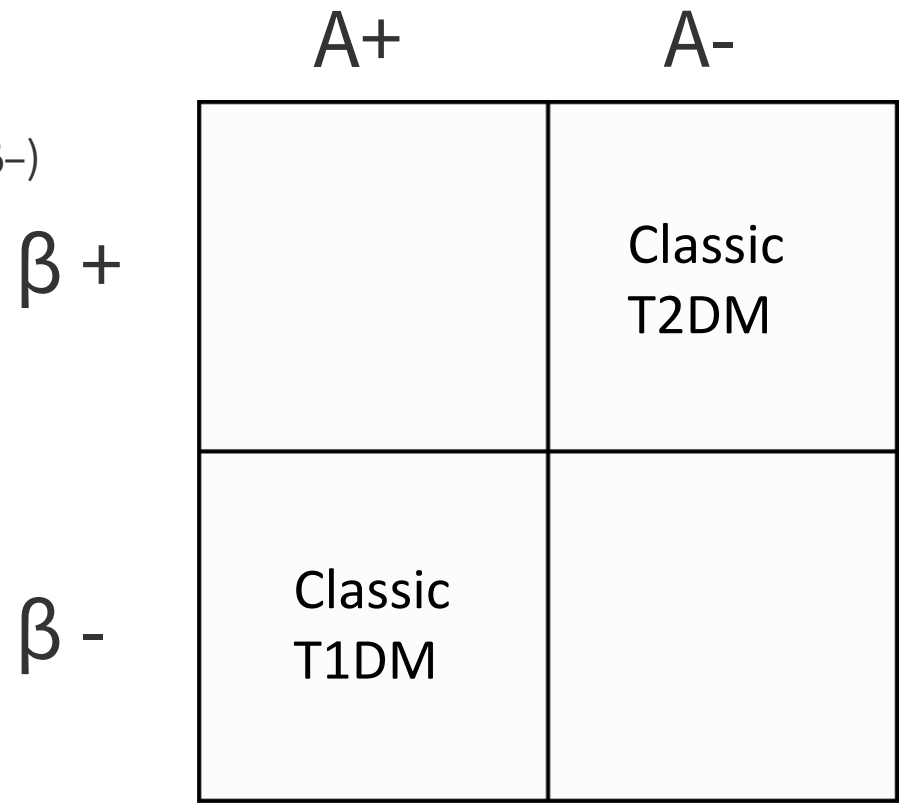
	Ref Range & Units	3 yr ago
Gad Antibody	0.0 - 5.0 IU/mL	>250.0 ^

T1DM vs T2DM

Clinical Features	T1DM	T2DM
Age	Any age! Average ~9years	Anytime after puberty, generally >age 25
Weight	Historically nl or low weight but not always	More common in those with elevated BMIs
Antibodies	Positive, GAD65 most common	Negative (mostly)
Family History	5-10%	75%+
Risk of ketosis	High	Low

T1DM vs T2DM

A = Autoantibody positivity or negativity (A+ or A–)
β = presence or absence of beta cell functional reserve (β+ or β–)



When should you refer?

- T1DM
- Latent autoimmune diabetes of the adult
- Pancreatitis-related diabetes
- Pancreatic cancer-related diabetes
- Cystic fibrosis-related diabetes
- Atypical Diabetes
- MODY
- Gestational Diabetes
- Diabetes in Pregnancy
- Checkpoint inhibitor diabetes

When should you refer?

- h/o pancreatitis
- Pancreatic cancer
- Known CF
- Hemochromatosis
- Alcoholism
- Autoimmune disease
- Diagnosed age <25

Know what you are treating

- Pt dx’d T2DM around 2010, tx w/metformin. In 2016, hospitalized for pancreatitis with pancreatic necrosis complicated by DKA in the setting of ongoing alcohol use. Her A1c during that admission was 11%. On discharge she was started on a basal bolus insulin regimen but wasn't consistent with taking it.
- Hospitalized for DKA in 2018 with A1c 14.6%. pH <6.8, anion gap >24 with glucose 542.
- Second DKA hospitalization in 2020 after not taking her medication for several months.

Know what you are treating

Type 2 Diabetes: Ketosis prone recurrent DKA, possible pancreatogenous component. Insulin is an essential part of her regimen in order to avoid DKA. I would avoid SGLT-2 in this patient given ketosis prone diabetes. I would avoid GLP-1 given pancreatitis.

Know what you are treating

- In 2022 established with a new PCP, A1c was 14.1%.
- She had not been taking insulin consistently and was having diarrhea with metformin
- Advised to stop everything, start Trulicity

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- **2 weeks later p/w abdominal pain, chest pain to ER. pH 7.09, AG 23.**
- **Dx'd with DKA**
- **Endocrine consult team restarted basal-bolus insulin.**

When should you refer?

Uncontrolled Type 2 diabetes with A1c >9-10%

Especially if clarity needed regarding type of diabetes or selection of appropriate agents or not responding to tx plan

When should you SOMETIMES refer

Needs insulin start

When should you SOMETIMES refer

Type 2 DM on basal bolus needing regular titration

When should you SOMETIMES refer

Type 2 DM on CGM needing review or titration

When should you SOMETIMES refer

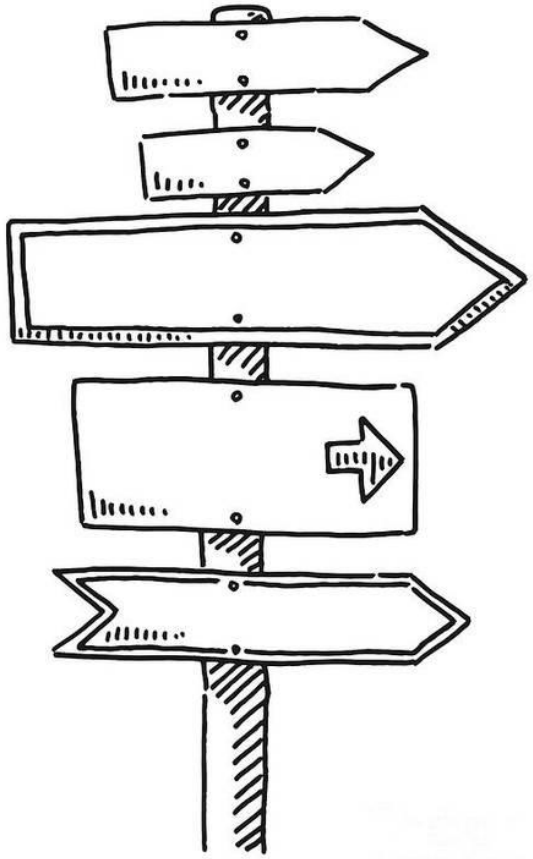
“Needs insulin pump”

When should you refer

On insulin pump – YES!

When should you NOT refer

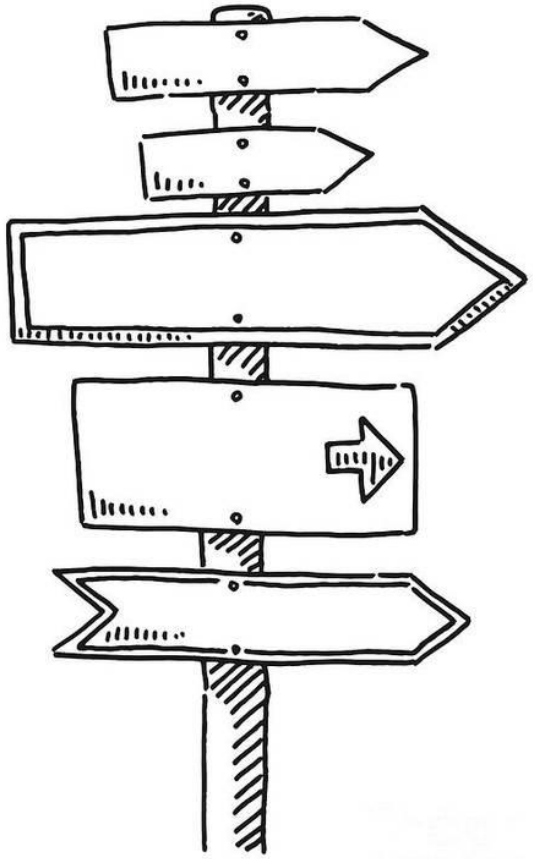
Needs CGM or help setting CGM up



Referral to Diabetes Education

When should you NOT refer

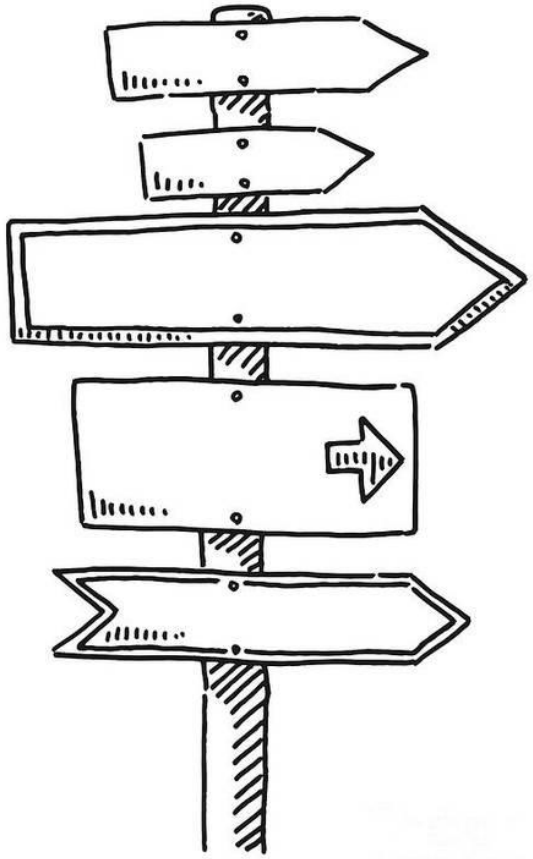
Diabetic neuropathy



Neurology (if atypical)

When should you NOT refer

Diabetic neuropathy

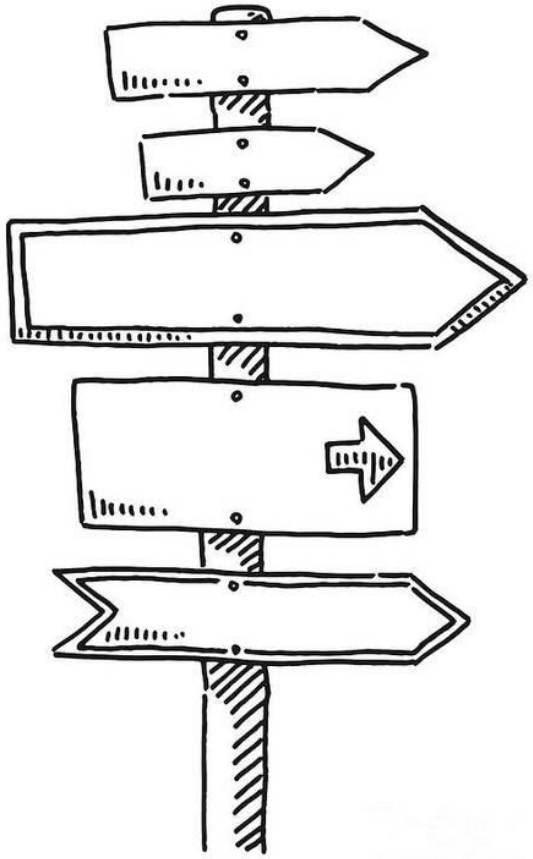


Medications

Gabapentin
Pregabalin
Nortriptyline
Venlafaxine
Duloxetine (Cymbalta)
Oxcarbazepine (Trileptal)
Mexilitine
Tramadol
Tapentadol (Nucynta)
Alpha lipoic acid
Capsaicin cream (topical)
Lidocaine patch (topical)
Menthol (topical)

When should you NOT refer

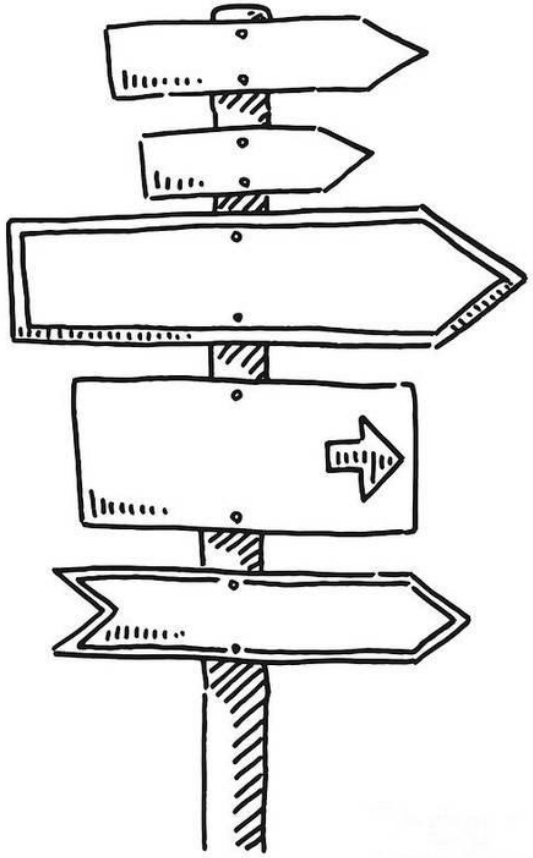
Diabetic
Shoes
Or
Diabetic
Foot
Wound



O&P
and
Podiatry
respectively

When should you NOT refer

Diabetic Shoes Or Diabetic Foot Wound



1. **History of partial or complete amputation of the foot**
2. **History of previous foot ulceration**
3. **History of pre-ulcerative callus**
4. **Peripheral neuropathy with evidence of callus formation** (monofilament or EMG)
5. **Foot Deformity** (Hallux limitus, hallux rigidus, hallux extensus, Hallux valgus, hallux abductovalgus, bunion deformity, Hammer toe, claw toe, mallet toe, overlapping toe, Tailor's bunion, Pes planus, pes cavus, Charcot arthropathy, Charcot foot deformity
6. **Poor Circulation** (PAD, Any pedal pulse under +2, ABI , Capillary Refill >3, Claudication, Cold feet on exam)

Summary

Refer persons with T2DM who are…

- Uncontrolled
- Unclear diagnosis – know what you are treating!
- Unclear which agents are safe
- Not responding to treatment plan
- On insulin pump
- New to insulin
- Basal-bolus insulin needing titration
- CGM review for adjustment

Questions?