Tamaulipas
Gobierno del Estado

Secretaría de Salud

1er Congreso Internacional

"HACIA UN SISTEMA DE SALUD INTEGRAL Y HUMANISTA EN TAMAULIPAS"

Síndrome Cardio Renal Metabólico

Dra. Allina P. Flores Mendoza

15/05/2025

Agenda

1er Congreso Internacional
"HACIA UN SISTEMA DE SALUD INTEGRAL Y HUMANISTA EN TAMAULIPAS"


INTRODUCCIÓN


FISIOPATOLOGÍA


DIAGNÓSTICO


MANEJO Y TRATAMIENTO

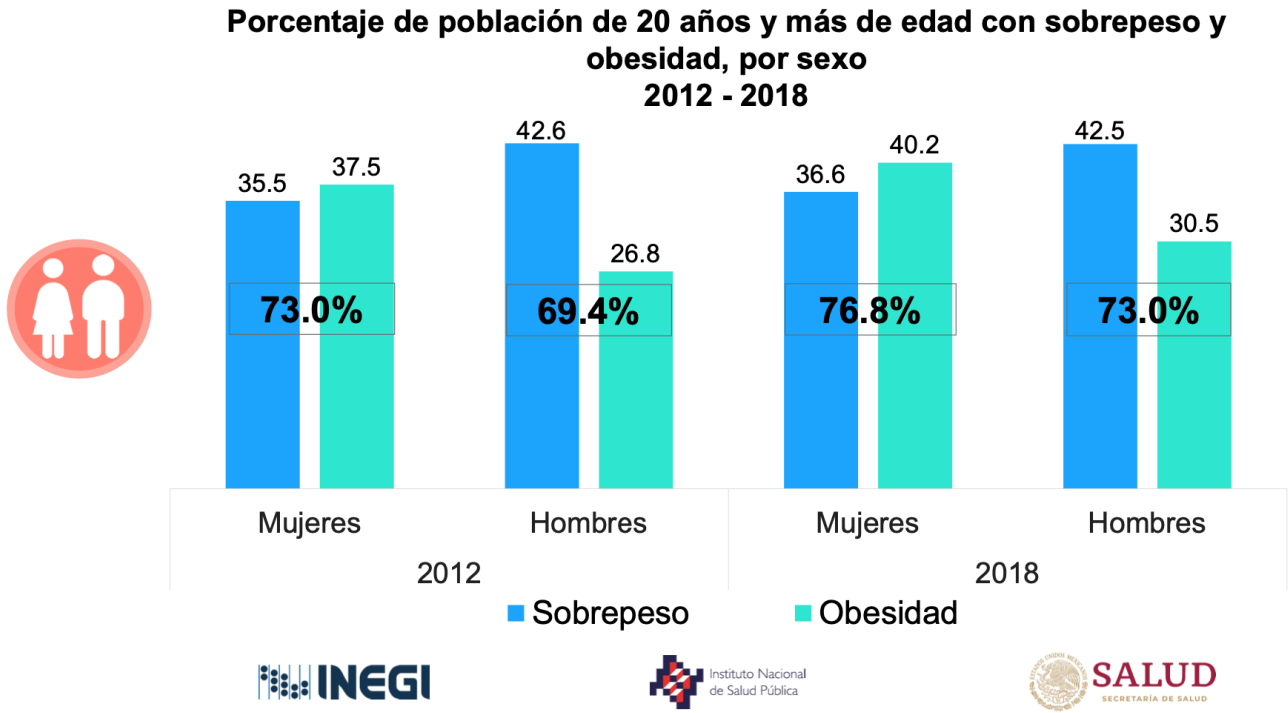

PREVENCIÓN Y PRONÓSTICO


CONCLUSIONES

Introducción

Sobrepeso y obesidad en población de 20 y más años

A nivel nacional, en **2018**, el porcentaje de adultos de 20 años y más con sobrepeso y obesidad es de **75.2%** (39.1% sobrepeso y 36.1% obesidad), porcentaje que en 2012 fue de **71.3 por ciento.**



43% a nivel mundia

DCRM 2.0: Multispecialty practice recommendations for the management of diabetes, cardiorenal, and metabolic diseases. Handelsman, Yehuda et al. Metabolism – Clinical and Experimental, Volume 159, 155931.

Salud Cardio-Metabólica Renal

Es la presentación de la fisiopatología de la interacción de los factores de riesgo

- Mortalidad prematura
- Exceso de morbilidad
- Enfermedad multiorgánica
- Altos costos

Emergencia de Salud Pública

25-30% PREVALENCIA DE LAS COMORBILIDADES

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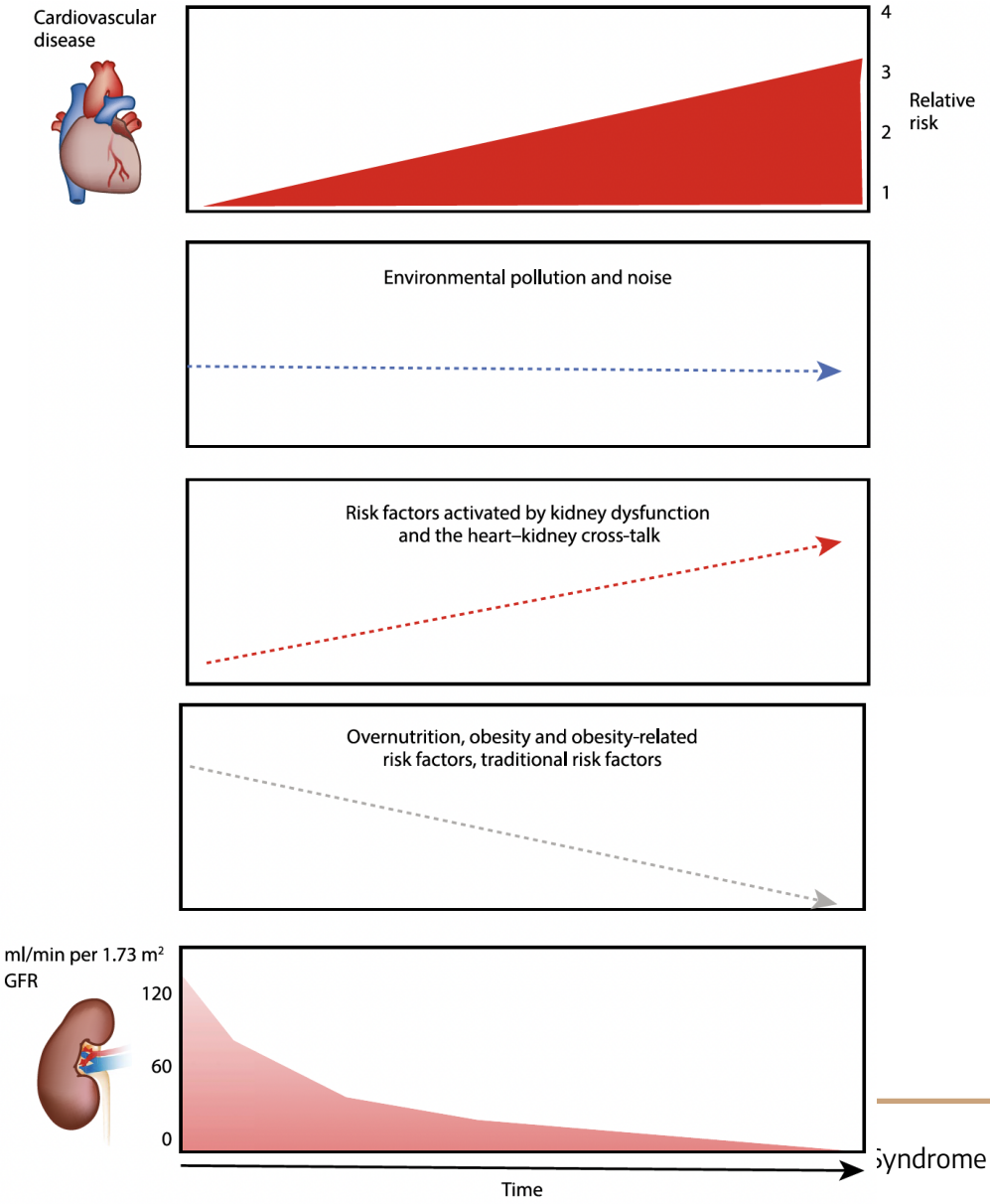
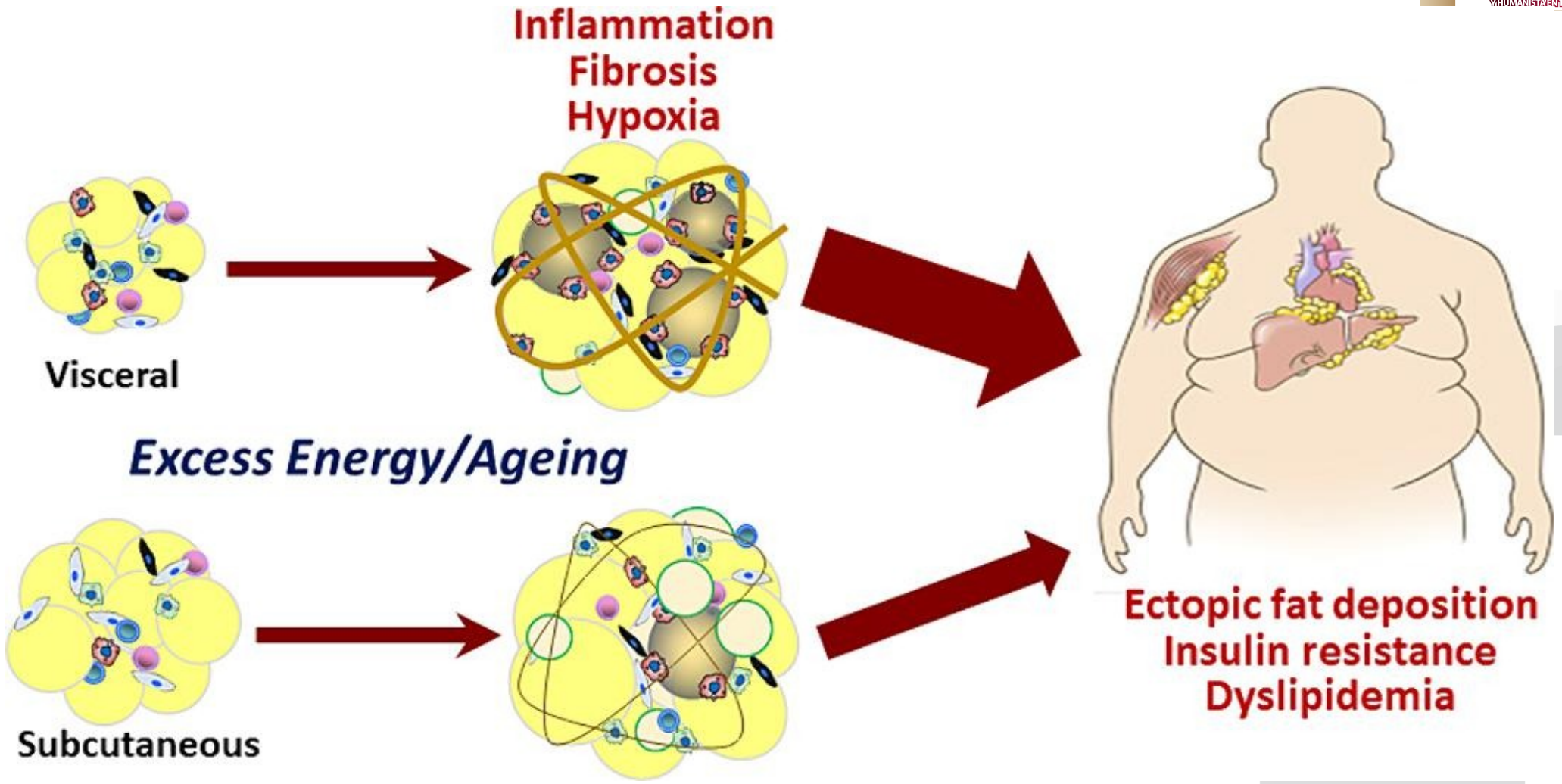
Síndrome CRM



Circulation. 2023;148:1606–1635. DOI: 10.1161/CIR.0000000000001184
Syndrome to Chronic Cardiovascular and Kidney Disorder: A Conceptual Transition. Clin J Am Soc Nephrol. 2024 Jun 1;19(6):813-820. doi: 10.2215/CJN.0000000000000361.

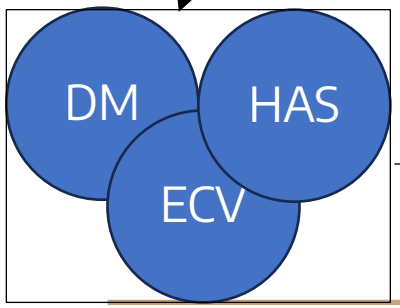
SCRM


Inflammation
Fibrosis
Hypoxia
Visceral
Excess Energy/Ageing
Subcutaneous
Ectopic fat deposition
Insulin resistance
Dyslipidemia

ADIPOSIDAD

↓Adiponectina, ↑Leptina, ↑Resistina, ↑Visfatina y otras adipocinas

- Cambios Humorales
  Resistencia a la insulina/hiperinsulinemia
  Activación del SRAA
- Cambios metabólicos
  Inflamación, estrés oxidativo, metabolismo anormal de los lípidos
- Cambios hemodinámicos
  Hiperfiltración glomerular, retroalimentación túbulo glomrular



ENFERMEDAD RENAL CRÓNICA

CJASN 20: 742–754, 2025. doi: https://doi.org/10.2215/CJN.0000000704

Inflamación
Disfunción endotelial
Y Cambios
hemodinámicos

Estrés oxidativo

Activación SRAA+SNS

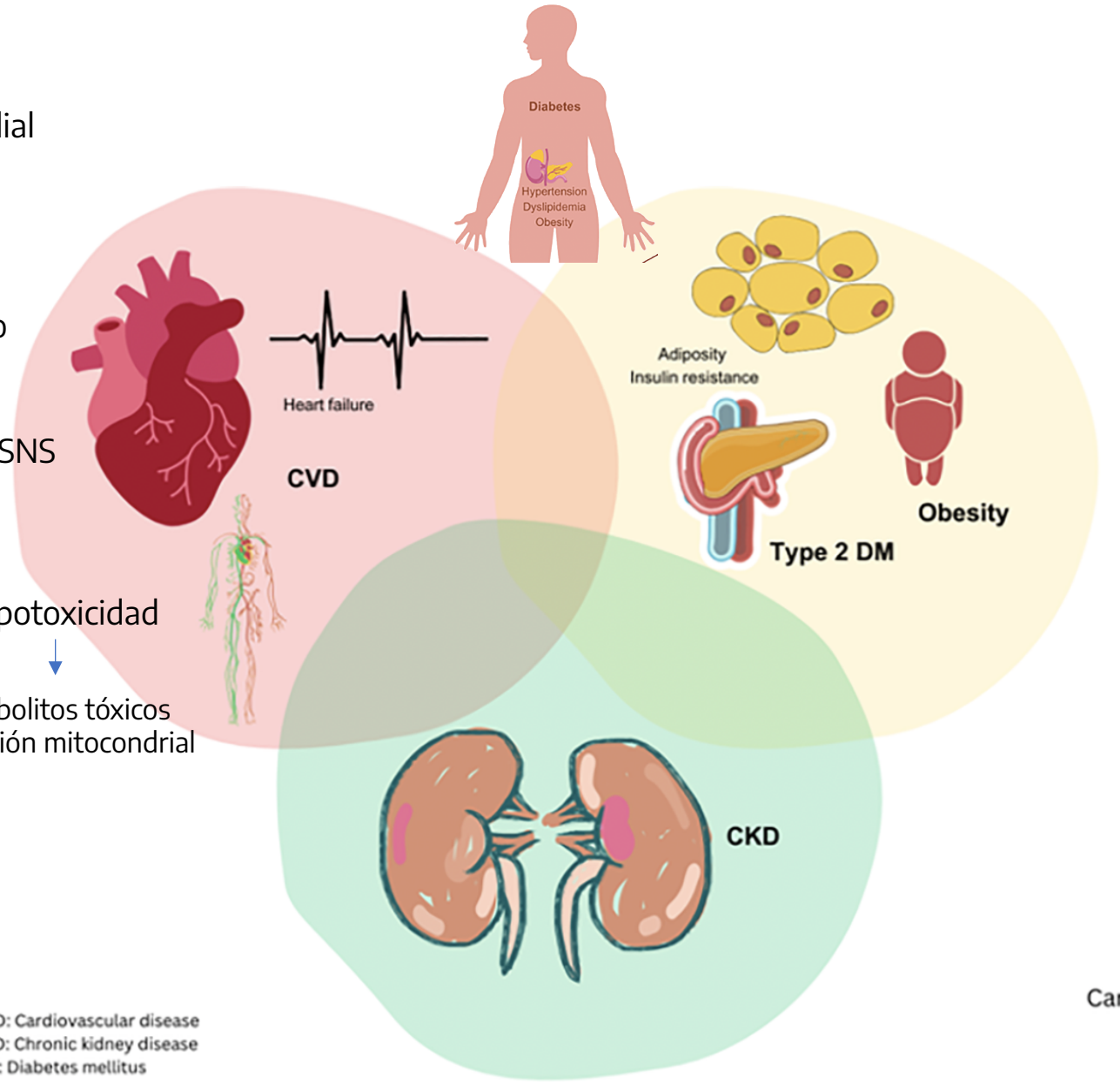
Glu
Resistencia
a la insulina

Lipotoxicidad

Metabolitos tóxicos
Disfunción mitocondrial

AGEs

Endurecimiento
vascular



CVD: Cardiovascular disease
CKD: Chronic kidney disease
DM: Diabetes mellitus

Excess/dysfunctional adipose tissue

Hypertension
Dyslipidemia
Metabolic syndrome
Diabetes

Myocardial remodeling
Cardiac fibrosis

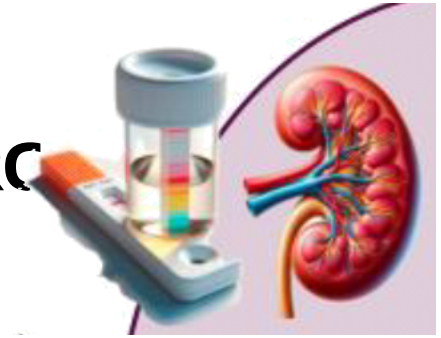
CVD

Glomerulosclerosis
Tubulointerstitial fibrosis

CKD

Cardiovascular-Kidney-Metabolic Syndrome

Progresión de ERC



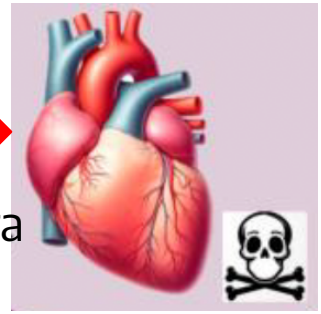
Inflamación
Estrés oxidativo
Disfunción vascular
Activación neurohormonal

TIEMPO

INSUFICIENCIA RENAL

Individuo con DT2 + ERC

Muerte prematura



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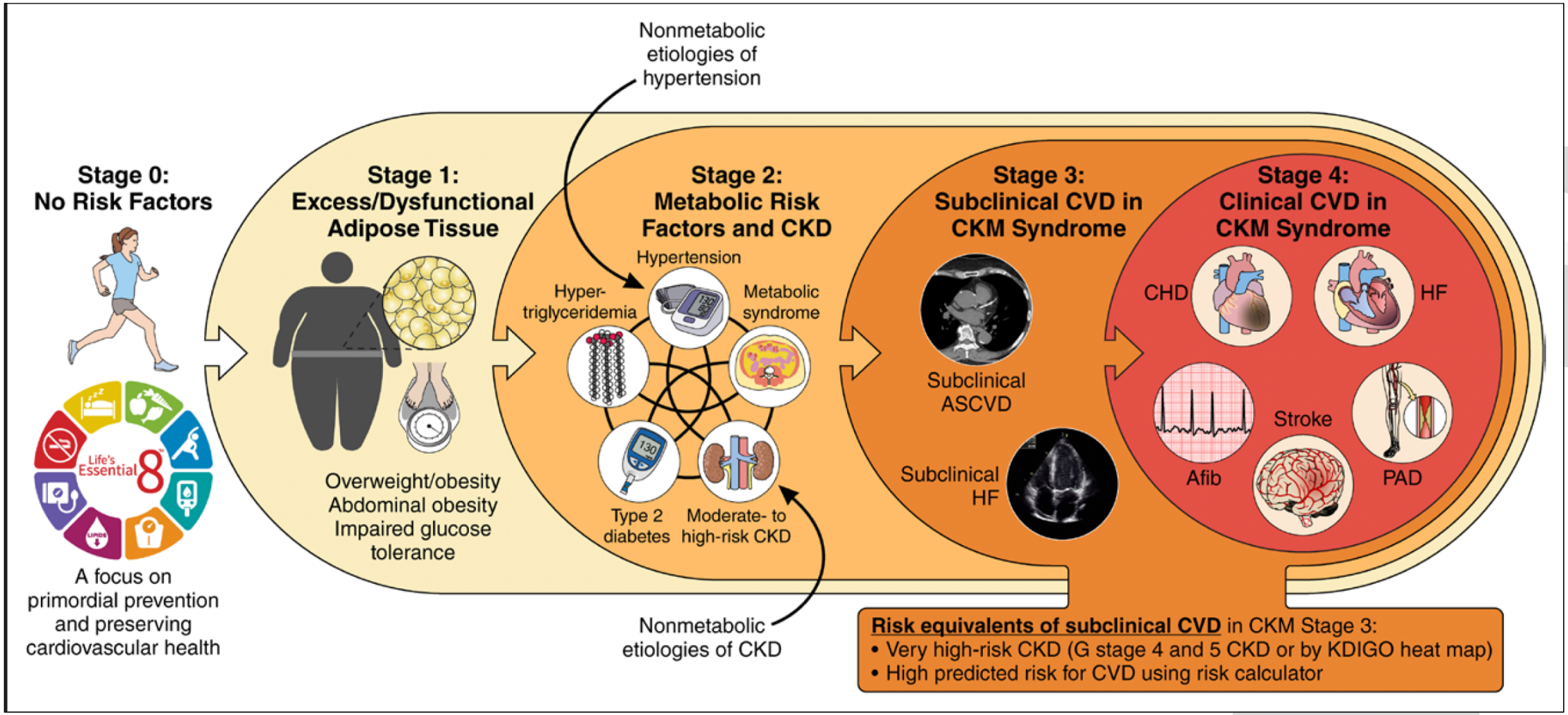
Clasificación



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Factores que favorecen el SCRM

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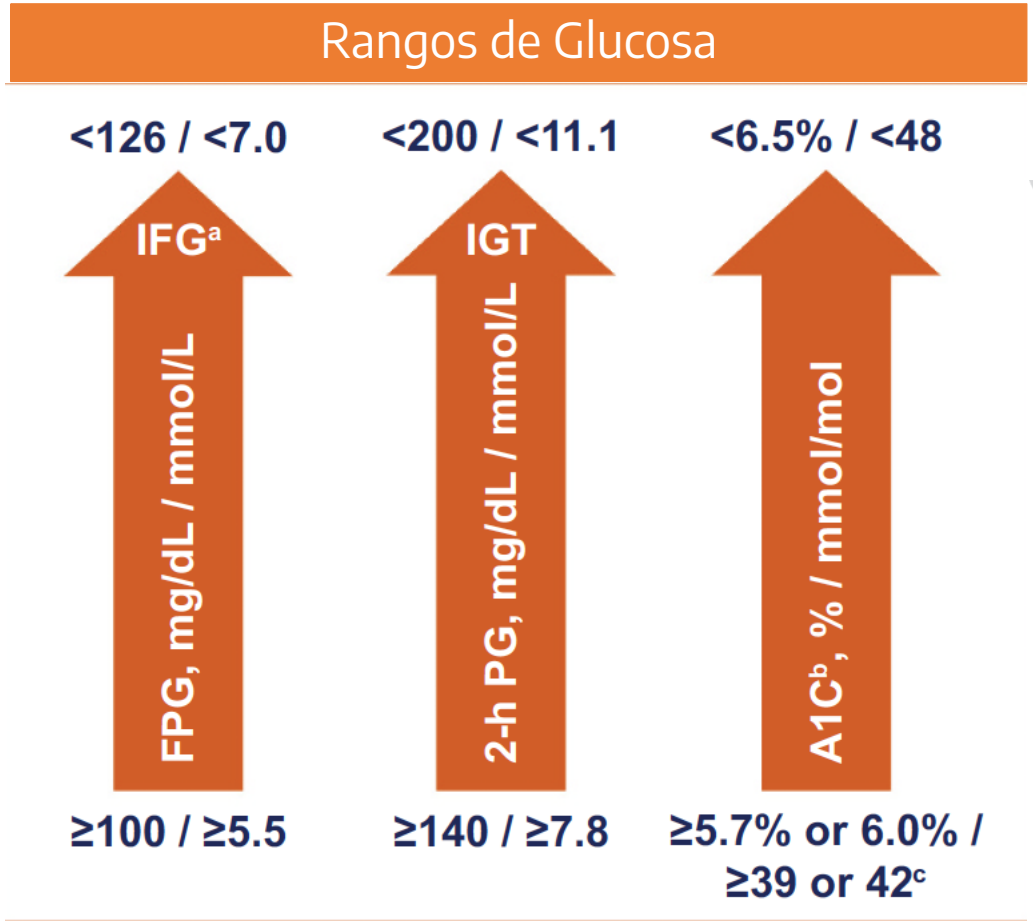
- Condiciones inflamatorias crónicas
- Grupos de alto riesgo demográficos
- Alta carga de efectos adversos SDOH
- Trastornos mentales (p.ej. ansiedad o depresión)
- Trastornos del sueño
- Factores potenciadores relacionados al genéro
- PCRhs +2 mg/l
- Historia familiar de ER, o DM

Prediabetes



8-11% progresan anualmente
Todos tienen riesgo de ERC, ECV, o IC

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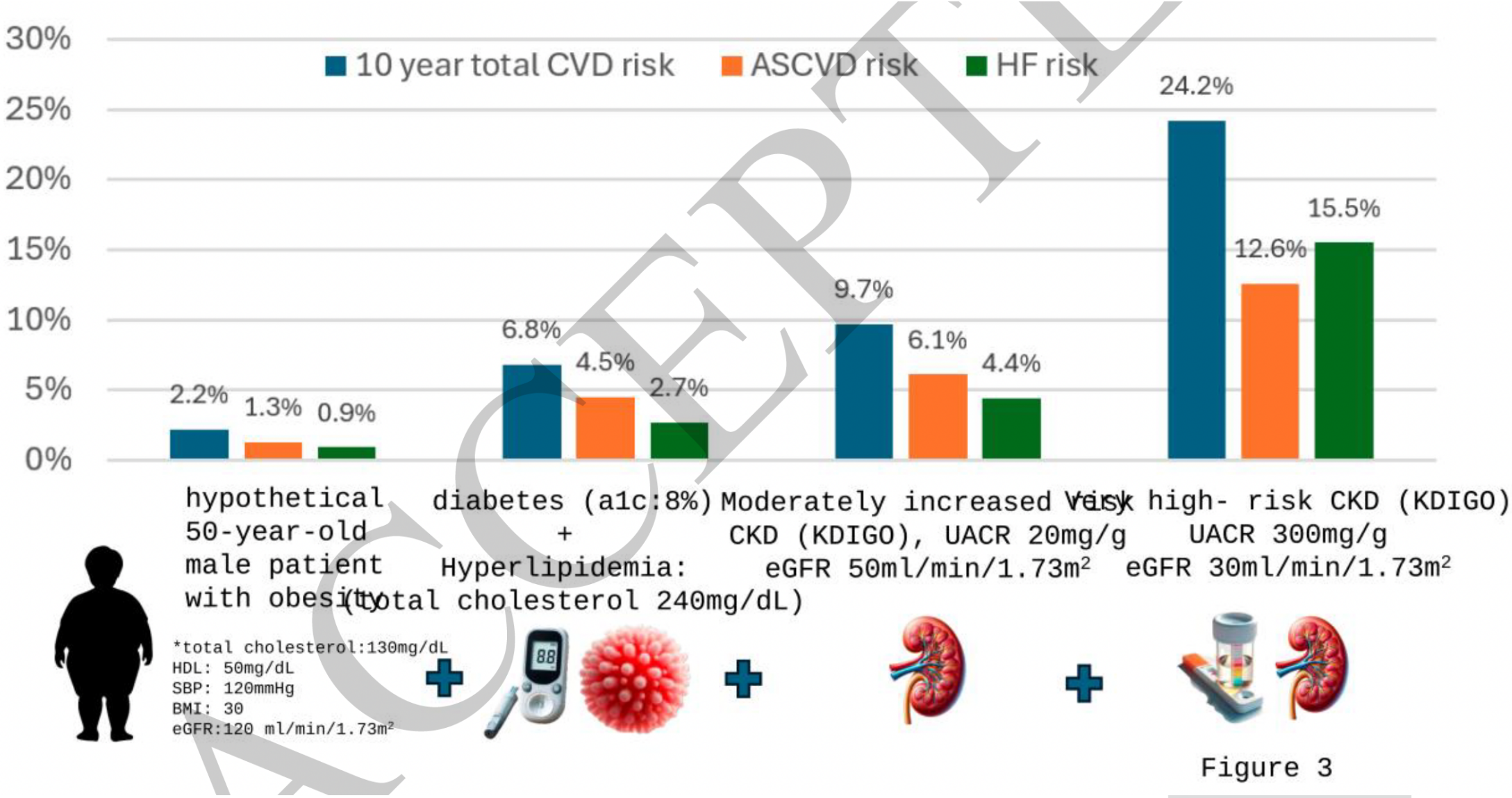


Figure 3

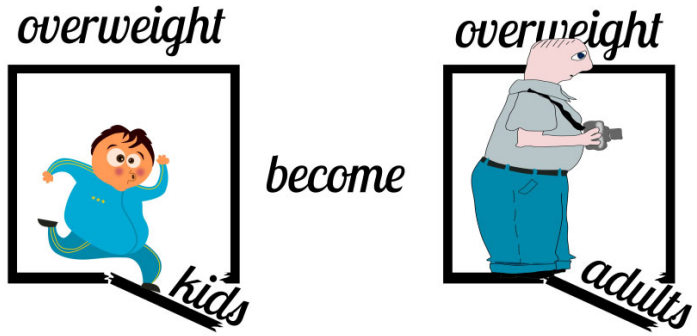
CJASN 20: 742–754, 2025. doi: https://doi.org/10.2215/CJN.0000000704

Abordaje diagnóstico

Etapa temprana de la vida

Tamizaje

- Cribado anual de peso/obesidad
- TA apartir de los 3ª, anual si no existen FR
- Salud mental y conductual
- Lípidos entre los 9 y 11 a, después entre los 17 y 21 años
- Glucosa/CTG/HbA1c entre los 9 y 11 a (sobrepeso/obesidad) c/2-3 años si riesgo de DM



Cases A, Broseta JJ, et al. Cardiovascular-kidney-metabolic syndrome definition and its role in the prevention, risk staging, and treatment. An opportunity for the Nephrology. Nefrologia (Engl Ed). 2024 Nov-Dec;44(6):771-783. doi: 10.1016/j.nefroe.2024.11.011.

Tamizaje > 21 años

Factores sociales adversos para la salud

ACR + Creatinina sérica/cistatina C
Anualmente en SCRM estadio 2 o mayor
Más frecuente de acuerdo al riesgo KDIGO

IMC+ Circunferencia de cintura ANUAL

Tamizaje de fibrosis hepática
Cada 1-2 años si es diabético, prediabético o 2 factores de riesgo

Tamizaje de SM
Anualmente si SCRM estadio 2
Cada 2-3 años estadio 1 o DMG
Cada 3-5 años en SCRM estadio 0

CACS , ecocardiograma – alto riesgo

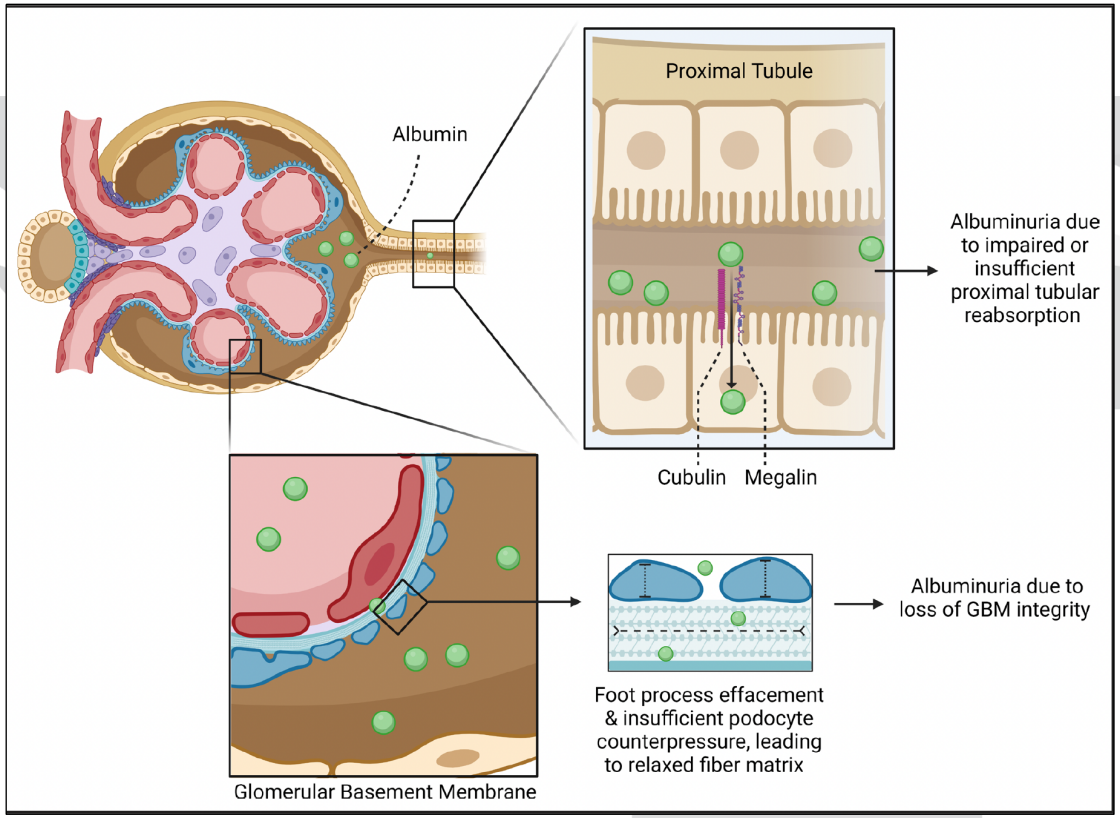
Cases A, Broseta JJ, et al. Cardiovascular-kidney-metabolic syndrome definition and its role in the prevention, risk staging, and treatment. An opportunity for the Nephrology. Nefrologia (Engl Ed). 2024 Nov-Dec;44(6):771-783. doi: 10.1016/j.nefroe.2024.11.011.

	Test	Condition	Purpose / Population	Frequency
Imaging	ECG	AF, ACS	Diagnostic / most adults	Annually
	Echocardiogram	AF, HF	Diagnostic / symptomatic or suspected AF or HF	If needed
	CAC score	ASCVD	CAC risk stratification / high risk for ASCVD or CAD • 0 = low risk, even in diabetes • 1–99 = moderate to high risk depending on percentile for age and gender • ≥100 or 75th percentile for age and gender = very high risk • >300 = secondary prevention equivalent	Every 5 years
	CTA	ASCVD	Diagnostic / angina or very high risk for ASCVD or very high CAC	If needed
	Treadmill and/or pharmacologic stress test, with or without imaging	ASCVD	Diagnostic / symptomatic CVD or very high CAC	If needed
	Carotid plaque by US (if symptoms) / PWV	Atherosclerosis	Early assessment / younger high-risk persons	Once; repeat if symptoms
	Retinal imaging with fundus camera	Diabetes	Diagnostic and assessment / diabetes	Every 1–2 years
	ABI	PAD	Diagnostic / claudication or suspected claudication	If needed
Biomarkers	Lp(a)	ASCVD	Diagnostic / all adults	Once, at initial screening
	ApoB, non-HDL-C, or LDL particle number	ASCVD	Assessment of atherosclerotic risk / high ASCVD risk	Annually
	Albuminuria	ASCVD, CKD, Diabetes, Obesity	Diagnostic and ongoing assessment / at-risk or existing CKD, diabetes, or HF • UACR ≥30 mg/g / ≥3 mg/mmol = high CVD risk • UACR ≥300 mg/g / ≥30 mg/mmol = CKD progression + very high CVD and HF risk	Annually
	eGFR	CKD	Diagnostic / all adults	Annually
	Natriuretic peptide (NTproBNP or BNP)	HF	Diagnostic and ongoing assessment / at-risk or existing HF	If needed
	hs-Troponin	HF	Diagnostic and ongoing assessment / myocardial injury or existing HF	If needed
Other	Foot exam with 10-g microfilament	Diabetes	Diagnostic and ongoing assessment / diabetes, at-risk or with neuropathy	Every visit

ABI = ankle brachial index; ACS = acute coronary syndrome; AF = atrial fibrillation; ApoB = apolipoprotein B; ASCVD = atherosclerotic cardiovascular disease; BNP = B-type natriuretic peptide; BP = blood pressure; CAC = coronary artery calcium; CAD = coronary artery disease; CKD = chronic kidney disease; CTA = computed tomography angiography; CVD = cardiovascular disease; ECG = electrocardiogram; eGFR = estimated glomerular filtration rate; HDL-C = high-density lipoprotein cholesterol; HF = heart failure; hs = high sensitivity; LDL = low-density lipoprotein; Lp(a) = lipoprotein (a); NTproBNP = N-terminal pro-B-type natriuretic peptide; PAD = peripheral artery disease; PWV = pulse wave velocity; UACR = urine albumin-creatinine ratio; US = ultrasound.

Albuminuria

- Determinante de progresión de ERC
- Factor de riesgo CV
- Biomarcador unificador de condiciones CMR
- 1ª orina de la mañana ACR ≈ 24h AER > ACR Spot ACR



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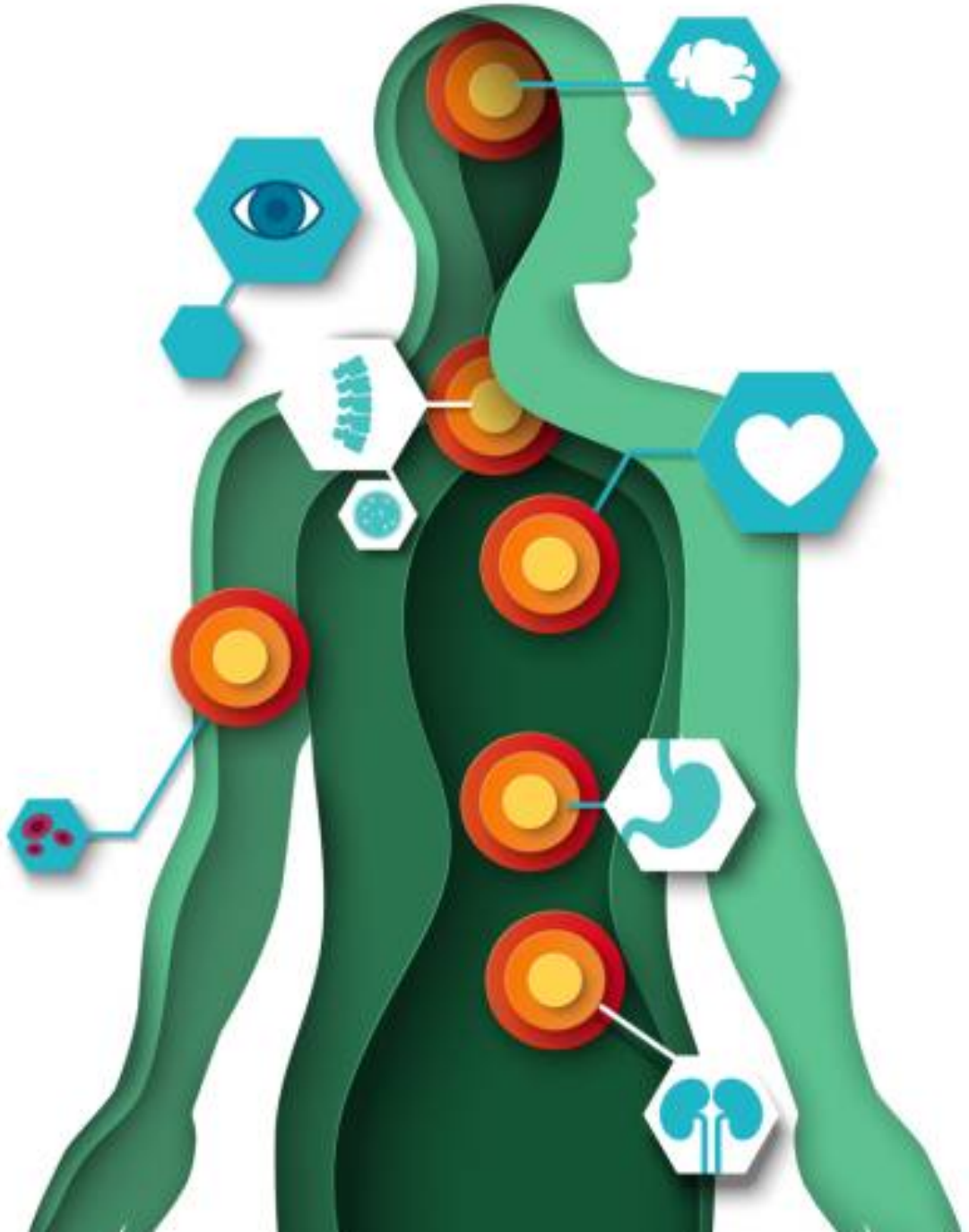

Tratamient
o holístico

Tratamiento del Estilo de Vida

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Educación al paciente

- ✓ Incrementa el conocimiento y promover el entedimiento:

- ✓ Reconocer obesidad, diabetes, CV, ERC y otras enfermedades CRM como crónicas
- ✓ Exámenes por realizar
- ✓ “Conocer y entender los números”
- ✓ Opciones de tratamiento
- ✓ Tecnología (apps)
- ✓ Sistema de salud y reembolso

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Decisiones compartidas

- Prioridades
- Enfatizar tratamiento temprano y agresivo
- Preguntas abiertas
- Afirmaciones personales y metas
- Motivar a que el paciente puede tener el control de sus resultados

No y No`s

- Proveer educación en cada visita
- No tratar de cubrir todos los temas en una visita
- Repita y refuerce
- No juzgar

Individualiza

- Evaluar y considerar literatura
- Tomar en cuenta factores económicos y sociales

Mejorar Adherencia

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Obesidad Enfermedad Crónica Heterogenea

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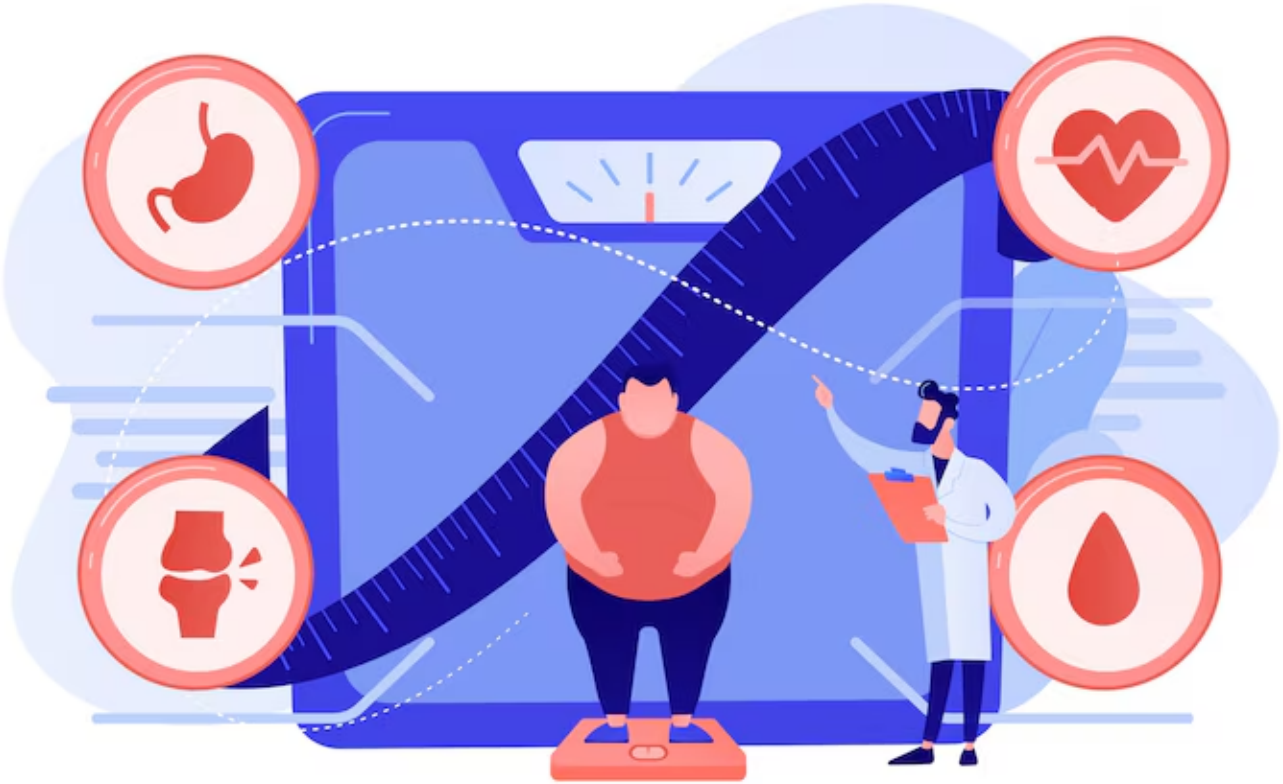
Evaluación Clínica (IMC, PA, eGFR, Lípidos y HbA1c%)

Evaluación centrada en obesidad

Desarrollo de metas

Determinar tratamiento

Monitoreo de respuesta



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Mean 1-Year Percent Weight Loss of Specific Therapies

Low-Intensity Lifestyle
Nutrition and physical activity education
1 contact x 15 min/month

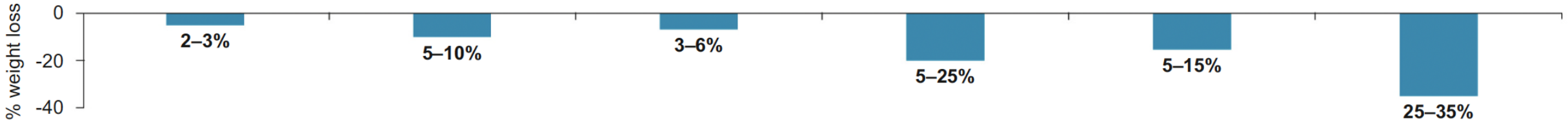
High-Intensity Lifestyle
Nutrition and physical activity education
Behavior modification
Meal replacement
Weekly/biweekly contact

Technology-Based
Web-based
Smart scales
Smart phone apps

Pharmacologic
GLP-1 RA-based[b]
Other anti-obesity medications

Endoscopic
Sleeve gastroplasty
Intragastric balloon

Surgical
Sleeve gastrectomy
Roux-en-Y gastric bypass
Biliopancreatic diversion with duodenal switch



[a] Glucose, sodium, potassium, chloride, carbon dioxide, BUN, creatinine, calcium, ALP, ALT, AST, bilirubin, albumin, total protein.
[b] GIP/GLP-1 RA or GLP-1 RA; 1.5-year weight loss.

A1C = hemoglobin A1C (HbA1c); ALP = alkaline phosphatase; ALT = alanine transaminase; AST = aspartate transaminase; BMI = body mass index; BP = blood pressure; BUN = blood urea nitrogen; CMP = comprehensive metabolic panel; eGFR = estimated glomerular filtration rate; GIP = glucose-dependent insulinotropic polypeptide; GLP-1 RA = glucagon-like peptide 1 receptor agonist.

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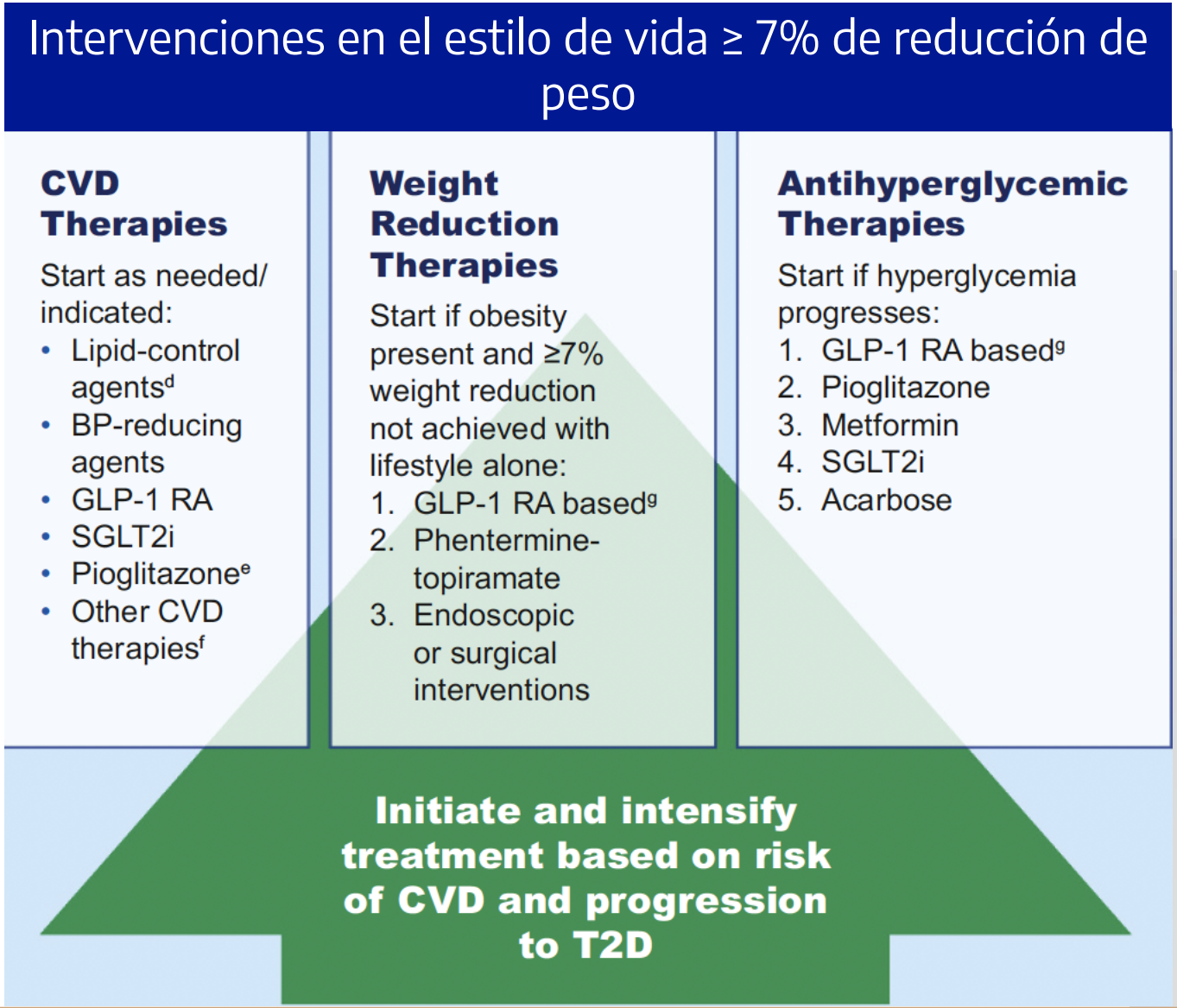
Prediabetes



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Trastornos en lípidos – c/6-12 semanas

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LDL-C Goal—Reduce LDL-C by ≥50% or Reach Risk-Based Goal, Whichever Leads to Lower LDL-C

mg/dL / mmol/L		
<100 / <2.6	High	≥2 RF + 10-y risk <10% Diabetes or CKD ≥3 with no other RF CAC <100[a]
<70 / <1.8	Very high	10-y risk >10% Diabetes or CKD ≥3 with ≥1 RF CAC >100[b] HeFH without ASCVD
<55 / <1.4	Extreme	Established ASCVD (CAD, PAD, TIA, ischemic stroke) CAC >300 Diabetes with target organ damage CKD ≥3 with albuminuria HeFH with FHx premature ASCVD (<55 years, male; <65 years, female)
<40 / <1.0	Extreme-plus	Progressive ASCVD despite LDL-C <55 mg/dL / <1.4 mmol/L

[a] And <75th age/sex percentile. [b] Or ≥75th age/sex percentile.

Expected Decrease in LDL-C

Statin	PCSK9i mAb	Eze	BA	Eze + BA	PCSK9i siRNA	BAS
↓ ~30–60%	↓ ~60%	↓ ~20%	↓ ~20%	↓ ~38%	↓ ~50%	↓ ~20%

- An elevated Lp(a) is an important RF independent of other RFs
- Choose initial statin dose likely to achieve LDL-C goal
- Use combination therapy when LDL-C is >50% higher than goal
- Add treatments every 6–12 weeks until goal is achieved

Management of Hypertriglyceridemia

Reduce risk of ASCVD	
All patients with elevated TG	Moderate-CHO diet + weight reduction + max-tolerated statin
Patients with TG 135–499 mg/dL / 1.52–5.63 mmol/L+ ASCVD or diabetes + 2 RF	Add IPE
Reduce risk of pancreatitis	
All patients with TG ≥500 mg/dL / ≥5.65 mmol/L	Moderate-CHO, low-fat diet + alcohol avoidance + weight reduction + max-tolerated statin Add fibrate, IPE, other OM3[c], or niacin
Patients with insulin resistance	Consider adding pioglitazone
Patients with acute, severe hypertriglyceridemia	Consider insulin, apheresis

Expected Decrease in TG

Statin	Fibrate	OM3[c]	Niacin	Pio
↓ ~20–30%	↓ ~30–50%	↓ ~30–40%	↓ ~20–30%	↓ ~10–15%

[c] EPA or EPA+DHA.

Proven ASCVD benefits in CVOTs

ASCVD = atherosclerotic cardiovascular disease; BA = bempedoic acid; BAS = bile acid sequestrant; CAC = coronary artery calcium; CAD = coronary artery disease; CHO = carbohydrate; CKD ≥3 = stage 3 or higher chronic kidney disease; CVOT = cardiovascular outcome trial; DHA = docosahexaenoic acid; EPA = eicosapentaenoic acid; Eze = ezetimibe; FHx = family history; HDL-C = high-density lipoprotein cholesterol; HeFH = heterozygous familial hypercholesterolemia; IPE = icosapent ethyl; LDL-C = low-density lipoprotein cholesterol; Lp(a) = lipoprotein (a); mAb = monoclonal antibody; OM3 = prescription-strength omega-3 fatty acid; PAD = peripheral artery disease; PCSK9i = proprotein convertase subtilisin/kexin type 9 inhibitor; Pio = pioglitazone; RF = major risk factors (i.e., advancing age, elevated non-HDL-C, elevated LDL-C, low HDL-C, diabetes, hypertension, CKD, cigarette smoking, pre-eclampsia, family history of ASCVD); siRNA = small interfering ribonucleic acid; TG = triglyceride; TIA = transient ischemic attack.

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Hipertensión  ≤130/80

Assess BP at Home Weekly and in Office Every 3–12 Months[b]		
Office BP	**Seated**	Back supported, feet flat on ground with oscillometric device connected; let person rest quietly for >5 min before checking BP twice, 1–2 min apart, followed by 1 orthostatic reading. BP can also be measured with automated oscillometric device attended or unattended.
Office BP	**Orthostatic[c]**	Assess standing BP for evaluation of volume depletion and autonomic dysfunction[d]
Ambulatory BP		Train persons with HTN how to measure seated BP at home upon waking. Transmit BP data via Bluetooth or via fax to patient chart

Preferred BP-Lowering Agents	Treatment Regimen
1. ARB or ACEi at maximum tolerated dose[e]	• Maintain lifestyle therapy • Use initial combination therapy if BP >20/10 mm Hg above goal • Add medications as needed to reach goal • Use combination products to foster adherence • Assess adherence with medications and dietary sodium
2. Dihydropyridine CCB	
3. Thiazide-type and thiazide-like diuretic	
4. MRA for resistant hypertension	

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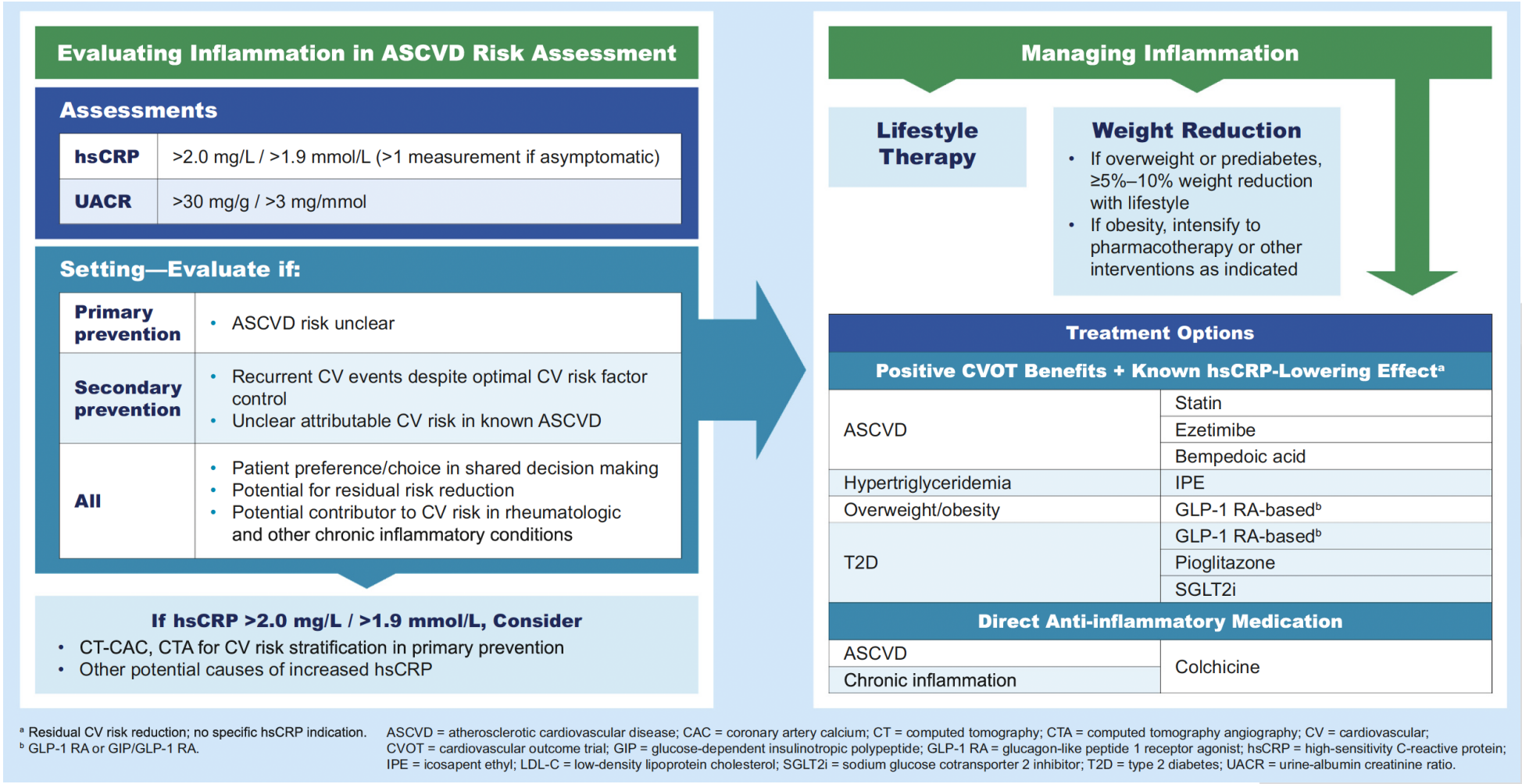
Inflamación



[a] Residual CV risk reduction; no specific hsCRP indication.
[b] GLP-1 RA or GIP/GLP-1 RA.

ASCVD = atherosclerotic cardiovascular disease; CAC = coronary artery calcium; CT = computed tomography; CTA = computed tomography angiography; CV = cardiovascular; CVOT = cardiovascular outcome trial; GIP = glucose-dependent insulinotropic polypeptide; GLP-1 RA = glucagon-like peptide 1 receptor agonist; hsCRP = high-sensitivity C-reactive protein; IPE = icosapent ethyl; LDL-C = low-density lipoprotein cholesterol; SGLT2i = sodium glucose cotransporter 2 inhibitor; T2D = type 2 diabetes; UACR = urine-albumin creatinine ratio.

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Lifestyle Therapy

Cardiorenal Track

Prevent ASCVD/HF/CKD Events Independent of Glycemic Status

ASCVD	HFpEF	HFrEF/HFmrEF	CKD	Stroke/TIA
GLP-1 RA[a,b]	SGLT2i[b]	SGLT2i[b]	SGLT2i[b]	GLP-1 RA[a]
SGLT2i[b]	GLP-1 RA[a,b]		GLP-1 RA[a,b]	Pio
Pio				

[a] GLP-1 RA with proven benefit.
[b] Combining GLP-1 RA and SGLT2i is encouraged to improve outcomes.
[c] GLP-1 RA or GIP/GLP-1 RA.
[d] If CKD, efficacy may be lower; consider using SGLT2i later in glucose hierarchy.
[e] Glycated albumin or fructosamine may also be considered for evaluation of glycemic control.
[f] Do not combine incretin classes (GLP-1 RA, GIP/GLP-1 RA, DPP4i). Use caution when combining insulin + SU, insulin + SGLT2i, or insulin + TZD.

AGI = alpha glucosidase inhibitor; ASCVD = atherosclerotic cardiovascular disease; CGM = continuous glucose monitoring; CKD = chronic kidney disease; CVOT = cardiovascular outcome trial; DPP4i = dipeptidyl peptide 4 inhibitor; GIP = glucose-dependent insulinotropic polypeptide; GLP-1 RA = glucagon-like peptide 1 receptor agonist; HF = heart failure; HFmrEF = heart failure with mildly reduced ejection fraction; HFpEF = heart failure with preserved ejection fraction; HFrEF = heart failure with reduced ejection fraction; MOA = mechanism of action; Pio = pioglitazone; QR = quick release; SGLT2i = sodium glucose cotransporter 2 inhibitor; SMBG = self-monitored blood glucose; SU = sulfonylurea; TIA = transient ischemic attack; TZD = thiazolidinedione.

Proven benefits in CVOTs Hypoglycemia and/or HF risk

Hyperglycemia Track

Manage Glycemia to Individualized Goals

Recently diagnosed, healthier, few to no comorbidities

A1C	6.0	6.5	7.0	7.5	%
	42	48	53	58	mmol/mol

Most patients

Limited life expectancy, frail, complex comorbidities

↓ Glucose Hierarchy

Preferred
- GLP-1 RA-based[c]
- Metformin
- SGLT2i[d]
- TZD
- Insulin
- DPP4i
- SU

Less used
- Glinide
- Colesevelam
- AGI
- Bromocriptine QR
- Pramlintide

- **Generally, use initial combination therapy for patients with A1C >1–2% above individualized goal**
- Lower A1C goals can be achieved safely provided there is no hypoglycemia
- Assess glucose control with A1C plus CGM or SMBG and intensify therapy until goal achieved[e]
- Add agents with complementary MOA to maintain glucose control at goal[f]
- Choose agents according to recommended hierarchy, based on individual patient's risks and benefits, preferences, and access to therapies
- Consider initial insulin therapy in severe hyperglycemia/metabolic decompensation

DCRM 2.0: Multispecialty practice recommendations for the management of diabetes, cardiorenal, and metabolic diseases. Handelsman, Yehuda et al. Metabolism – Clinical and Experimental, Volume 159, 155931.

Anticoagulación y Antiagregación

1er Congreso Internacional "HACIA UN SISTEMA DE SALUD INTEGRAL Y HUMANISTA EN TAMAULIPAS"

	Condition	Risk Consideration	Recommended Medication
Primary Prevention	No known ASCVD but ≥2 RF	Low bleeding risk	• Aspirin 75–100 mg daily
	CAC ≥100	Low bleeding risk	• Aspirin 75–100 mg daily
Secondary prevention	ACS, within 1 year of event		• Aspirin 75–100 mg + P2Y12i
	Stable CAD with history of PCI or >12 months after ACS	High ischemic risk AND Low bleeding risk	• Aspirin 75–100 mg + ticagrelor 60 mg BID • Rivaroxaban 2.5 mg BID + aspirin 75–100 mg • Aspirin 75–100 mg + clopidogrel 75 mg
		Low ischemic risk OR High bleeding risk	• Clopidogrel 75 mg daily • Aspirin 75–100 mg daily
	Stable CAD, no PCI	High ischemic risk AND Low bleeding risk	• Rivaroxaban 2.5 mg BID + aspirin 75–100 mg
		Low ischemic risk OR High bleeding risk	• Clopidogrel 75 mg daily • Aspirin 75–100 mg daily
	PAD	Without limb revascularization	• Rivaroxaban 2.5 mg BID + aspirin 75–100 mg • Clopidogrel 75 mg daily
		After limb revascularization	• Rivaroxaban 2.5 mg BID + aspirin 75–100 mg

ACS = acute coronary syndrome; ASCVD = atherosclerotic cardiovascular disease; BID = twice daily; CAC = coronary artery calcium score; CAD = coronary artery disease; CKD = chronic kidney disease; HDL-C = high-density lipoprotein cholesterol; LDL-C = low-density lipoprotein cholesterol; PAD = peripheral artery disease; P2Y12i = P2Y12 inhibitor; PCI = percutaneous coronary intervention; RF = major risk factors (i.e., advanced age, elevated non-HDL-C, elevated LDL-C, low HDL-C, diabetes, hypertension, CKD, cigarette smoking, family history of ASCVD).

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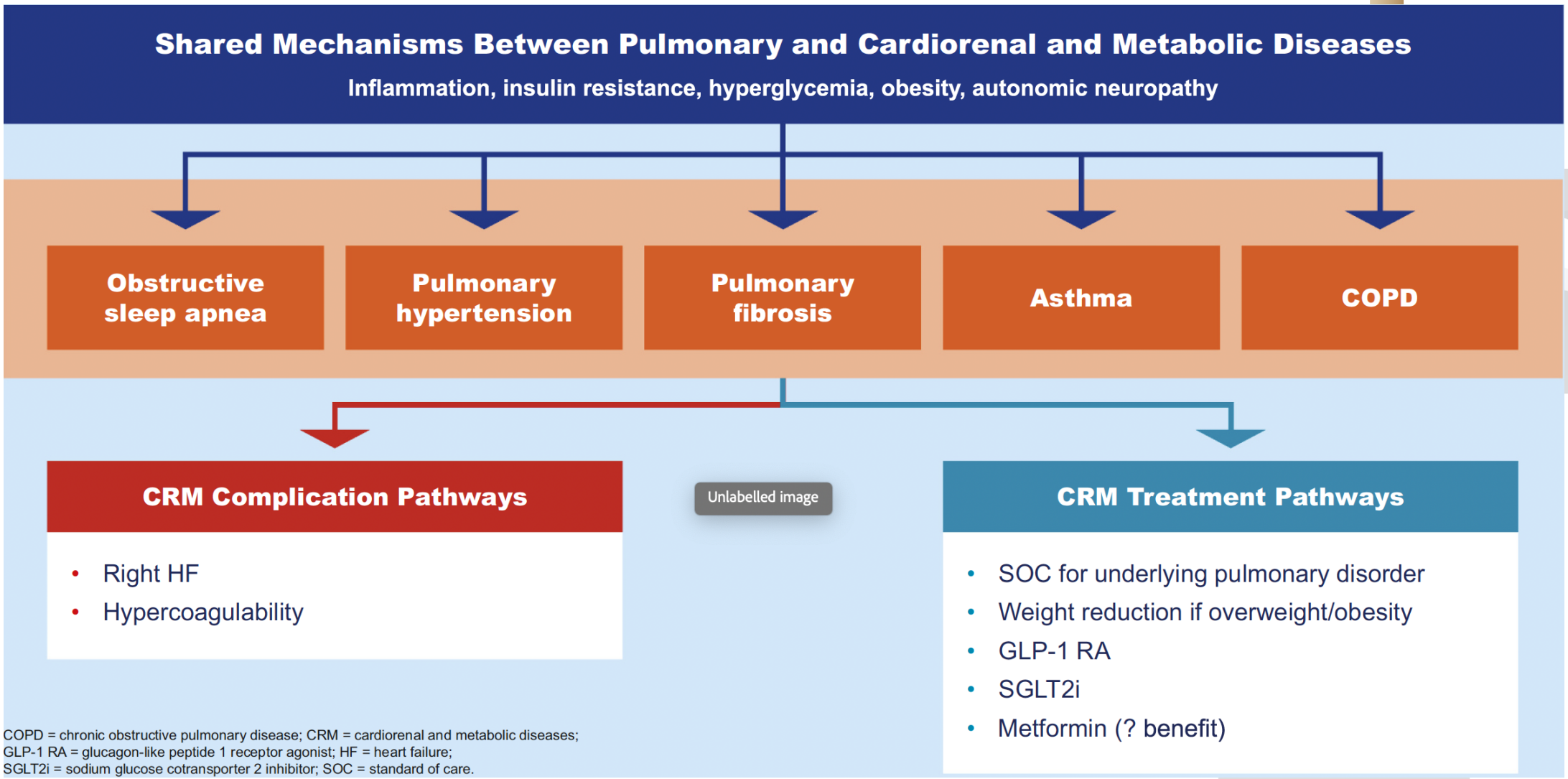
Enfermedad Pulmonar en el SCRM



COPD = chronic obstructive pulmonary disease; CRM = cardiorenal and metabolic diseases; GLP-1 RA = glucagon-like peptide 1 receptor agonist; HF = heart failure; SGLT2i = sodium glucose cotransporter 2 inhibitor; SOC = standard of care.

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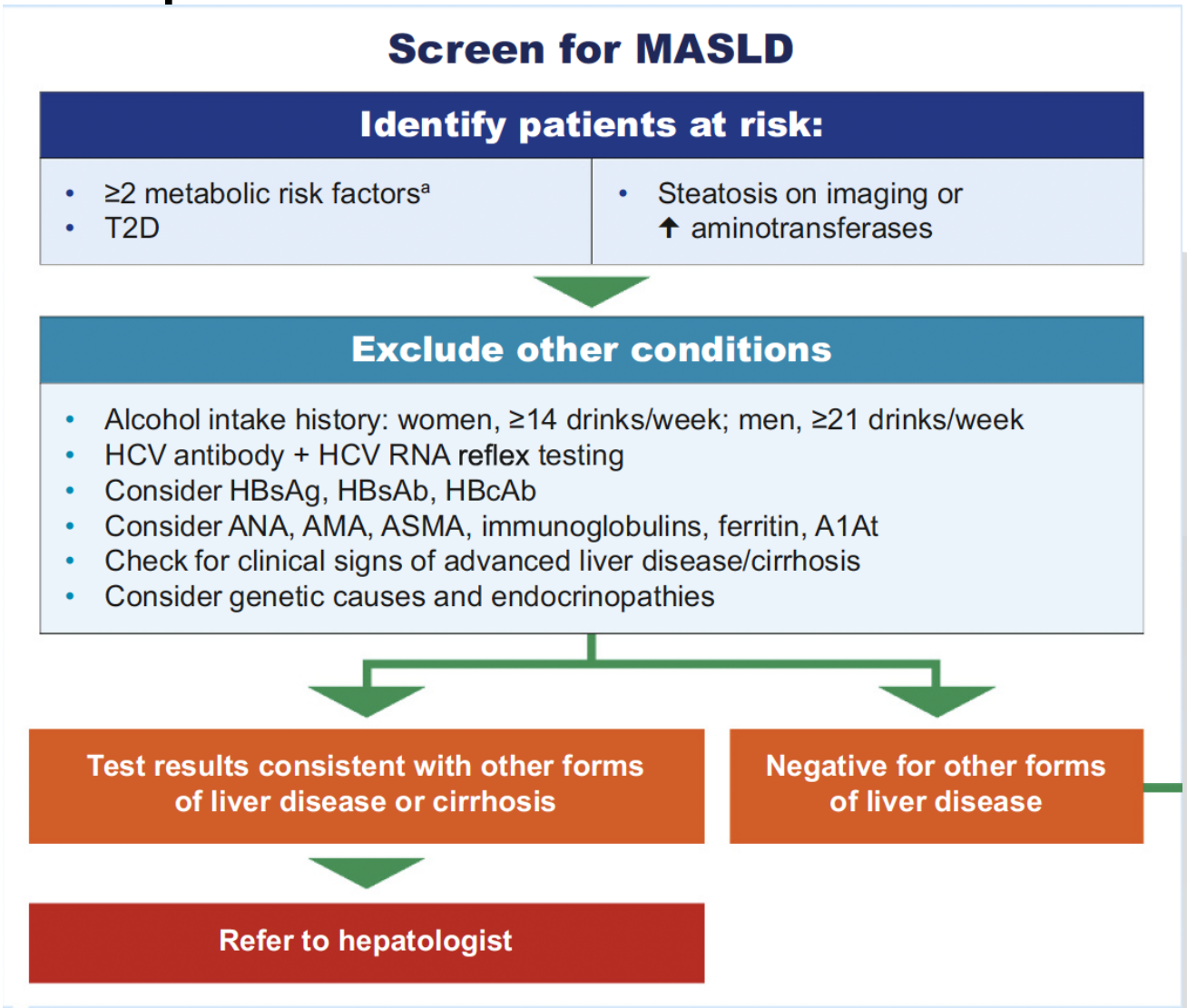
Enfermedad Hepática



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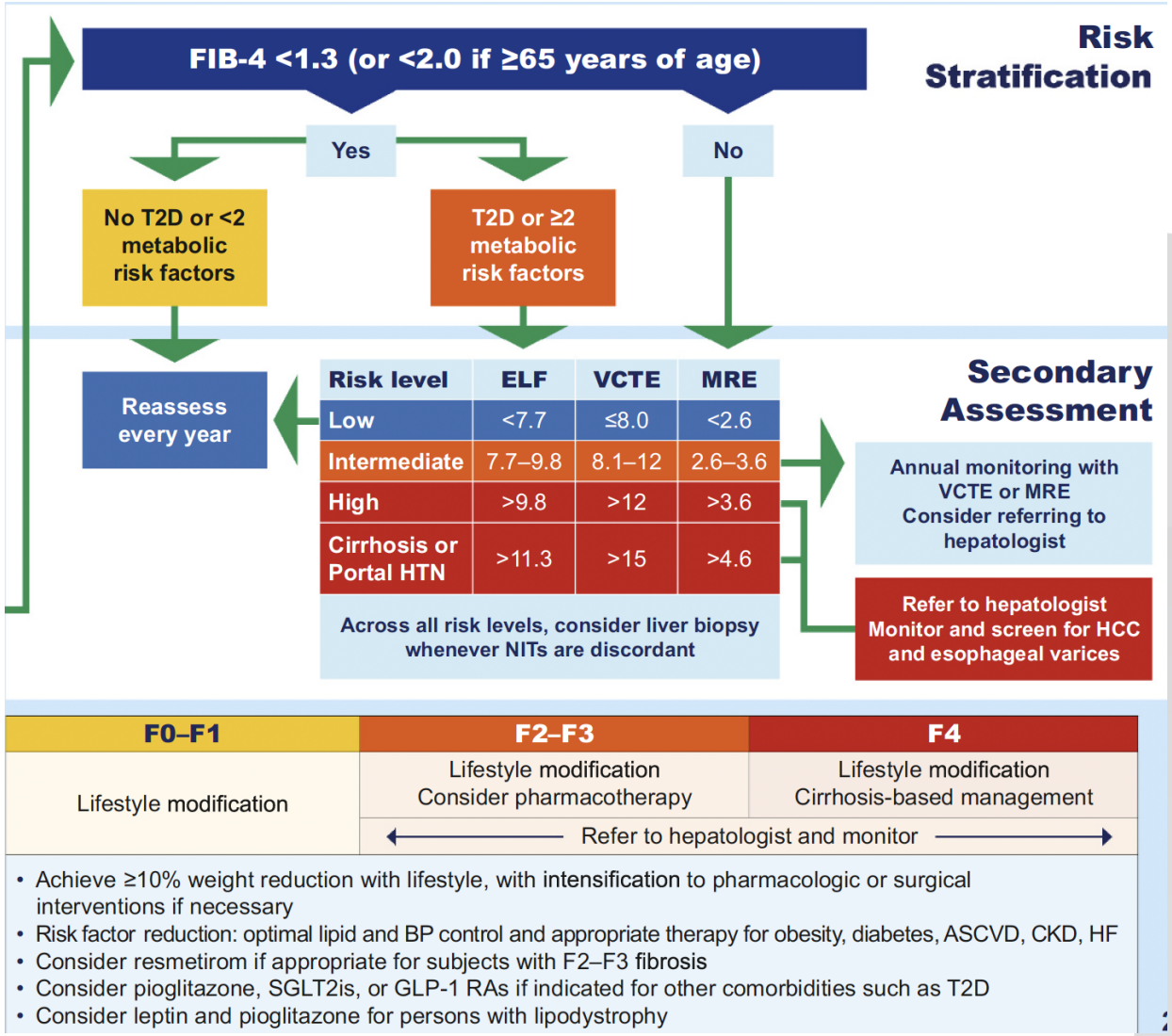
Enfermedad Hepática



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Enfermedad Renal Crónica

PREVENCIO

Risk Assessment

CKD associated with:

- ↑ Mortality
- ↑ ASCVD (increased risk if UACR ≥30 mg/g / ≥3 mg/mmol
- ↑ HF
- ↑ ESKD
- ↑ Hypertension
- ↑ Arrhythmia
- ↑ Hypoglycemia

Lifestyle Therapy *Plus* Goal-Directed Pharmacotherapy

- BP control (<130/80 mm Hg)
- Glucose control (A1C <7.0% / <53 mmol/mol)
- Lipid control (max dose statin ± other lipid-lowering agents)
- Albuminuria reduction (RASi

Unlabelled image

A1C = hemoglobin A1C (HbA1c); ASCVD = atherosclerotic cardiovascular disease; BP= blood pressure; CKD = chronic kidney disease; eGFR = estimated glomerular filtration rate; ESKD = end-stage kidney disease; HF = heart failure; GLP-1 RA = glucagon-like peptide 1 receptor agonist with proven benefit; MRA = mineralocorticoid receptor agonist; RASi = renin angiotensin system inhibitor; SGLT2i = sodium glucose cotransporter 2 inhibitor; UACR = urine albumin-creatinine ratio.

MANEJO

Screening and Diagnosis

Assess:	Diagnose CKD if:
• UACR	• Persistent UACR ≥30 mg/g / ≥3 mg/mmol
– and –	*– and/or –*
• eGFR	• Persistent eGFR <60 mL/min/1.73 m²

CKD with diabetes	Max tolerated RASi[a] + SGLT2i + Nonsteroidal MRA + GLP-1 RA
CKD without diabetes	Max tolerated RASi[a] + SGLT2i

[a] Avoid down-titration or cessation if hyperkalemic.

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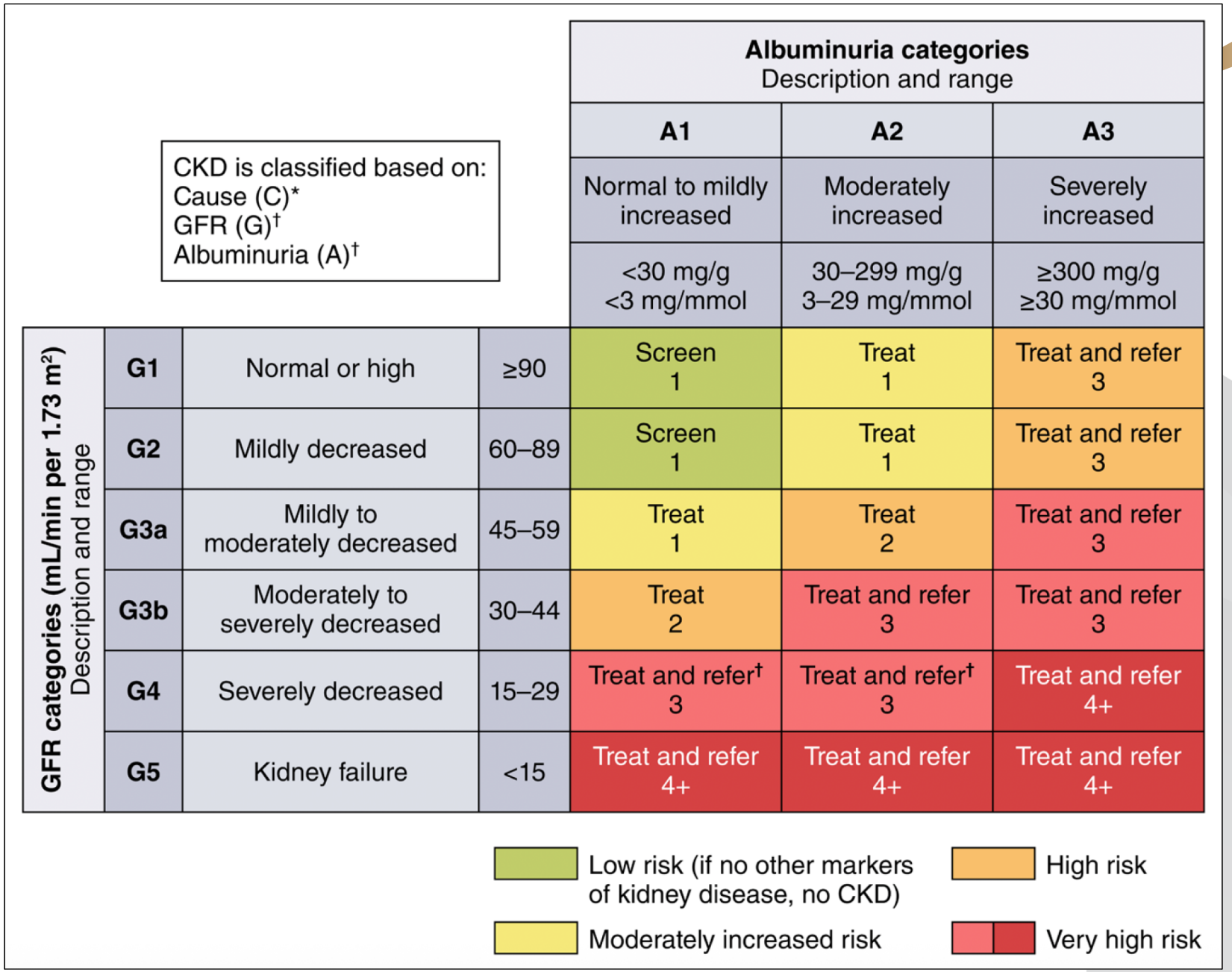
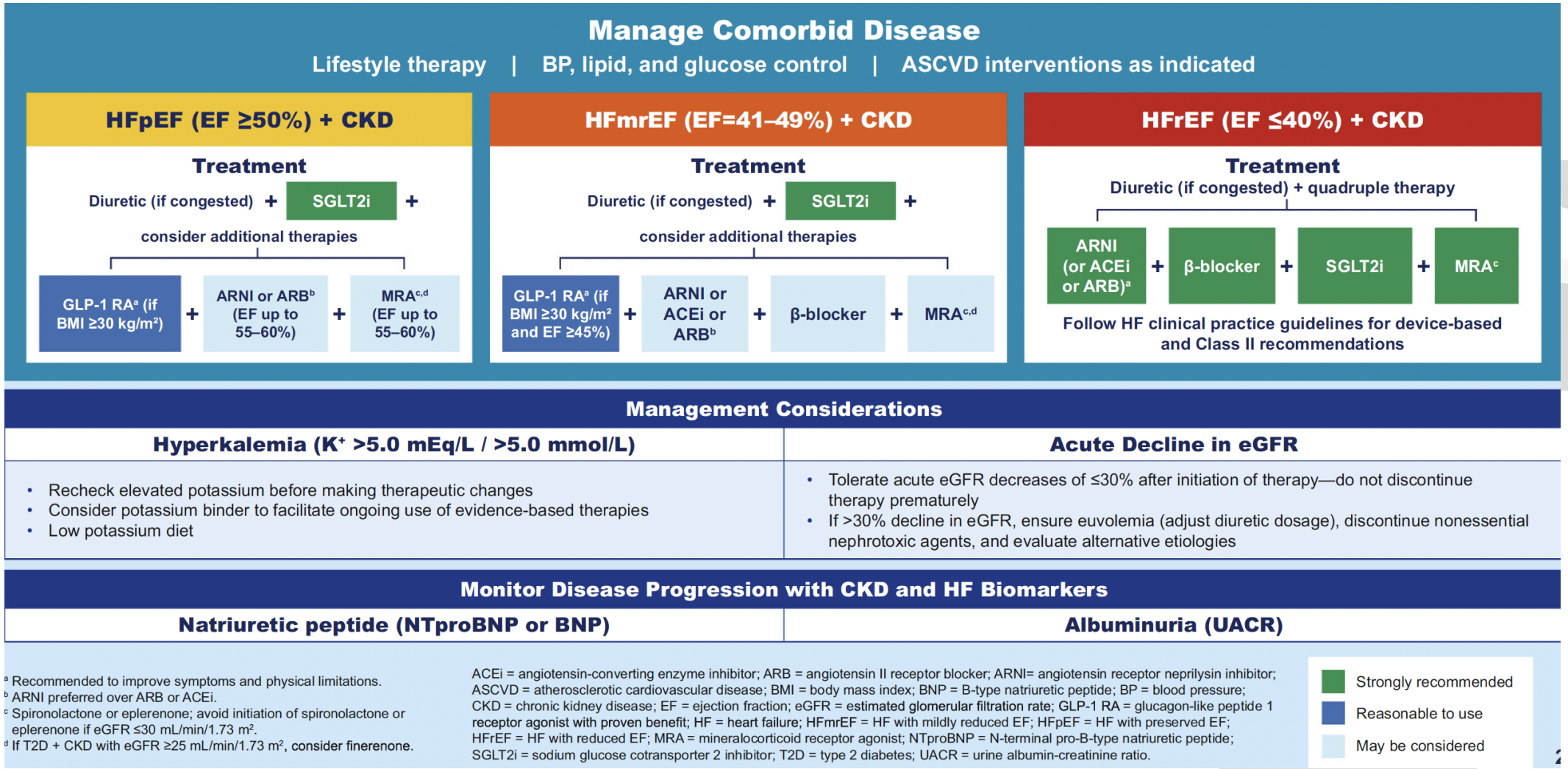

CKD is classified based on:
Cause (C)*
GFR (G)†
Albuminuria (A)†
Albuminuria categories
Description and range
A1
Normal to mildly increased
<30 mg/g
<3 mg/mmol
A2
Moderately increased
30–299 mg/g
3–29 mg/mmol
A3
Severely increased
≥300 mg/g
≥30 mg/mmol
GFR categories (mL/min per 1.73 m²)
Description and range
G1 Normal or high ≥90
Screen 1 | Treat 1 | Treat and refer 3
G2 Mildly decreased 60–89
Screen 1 | Treat 1 | Treat and refer 3
G3a Mildly to moderately decreased 45–59
Treat 1 | Treat 2 | Treat and refer 3
G3b Moderately to severely decreased 30–44
Treat 2 | Treat and refer 3 | Treat and refer 3
G4 Severely decreased 15–29
Treat and refer† 3 | Treat and refer† 3 | Treat and refer 4+
G5 Kidney failure <15
Treat and refer 4+ | Treat and refer 4+ | Treat and refer 4+
Low risk (if no other markers of kidney disease, no CKD)
High risk
Moderately increased risk
Very high risk

Enfermedad Renal Crónica e Insuficiencia Cardiaca



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Stage 1: Excess or Dysfunctional Adiposity

Discuss weight loss using STOP obesity alliance toolkit

Can consider **weight loss support via integrated team** to facilitate lifestyle change/ navigate weight loss options (obesity medicine, metabolic surgery, dietician, pharmacy, mental health, CHW/care manager):

- Intensive lifestyle intervention
- Pharmacotherapies (BMI ≥30 kg/m^2 without comorbidities)
- Bariatric surgery (BMI ≥40 kg/m^2 without comorbidities)

If persistent/progressive IGT despite intensive lifestyle modification → **consider metformin**

Stage 2: Established CKM Risk Factors

Presence of metabolic syndrome triggers intensive lifestyle intervention targeting multifactorial risk control

Pharmacotherapy for comprehensive control of residually uncontrolled MetS components

Hypertriglyceridemia
- Lifestyle modification
- Maximize statin therapy in intermediate or higher ASCVD risk
- TG ≥500 mg/dL → fibrates
- TG: 135-499 mg/dL + diabetes + additional risk factors → consider eicosapentaenoic acid (EPA)

Hypertension
- Lifestyle modification
- Follow established hypertension guidelines to achieve BP <130/80 mmHg
- In those with diabetes and albuminuria → prioritize ACEi/ARB
- In those with CKD → prioritize ACEi/ARB

Moderate- to High-Risk Chronic Kidney Disease*
- With albuminuria (UACR >30 mg/g) → ACEi/ARB
- CKD (with or without diabetes) → SGLT2i†
- DKD with residual albuminuria (>30 mg/g) on ACEi/ARB → finerenone§ (can be used on background SGLT2i)

Diabetes
- Lifestyle modification
- Moderate-to-high intensity statin
- Ezetimibe for high risk

Comorbidity-based approach to antihyperglycemic pharmacotherapy:
- BMI ≥35 kg/m^2 → GLP-1RA
- HbA1c ≥9% or high insulin dose → GLP-1RA
- CKD → SGLT2i†

Considerations for Metformin Co-Utilization

HbA1c ≥7.5% or on insulin → Co-utilization of metformin‡ and cardioprotective antihyperglycemics

HbA1c <7.5% → Cardioprotective antihyperglycemics without metformin initiation (continue metformin‡ if already using)

Stage 3: Subclinical CVD in CKM Syndrome

Subclinical Atherosclerosis

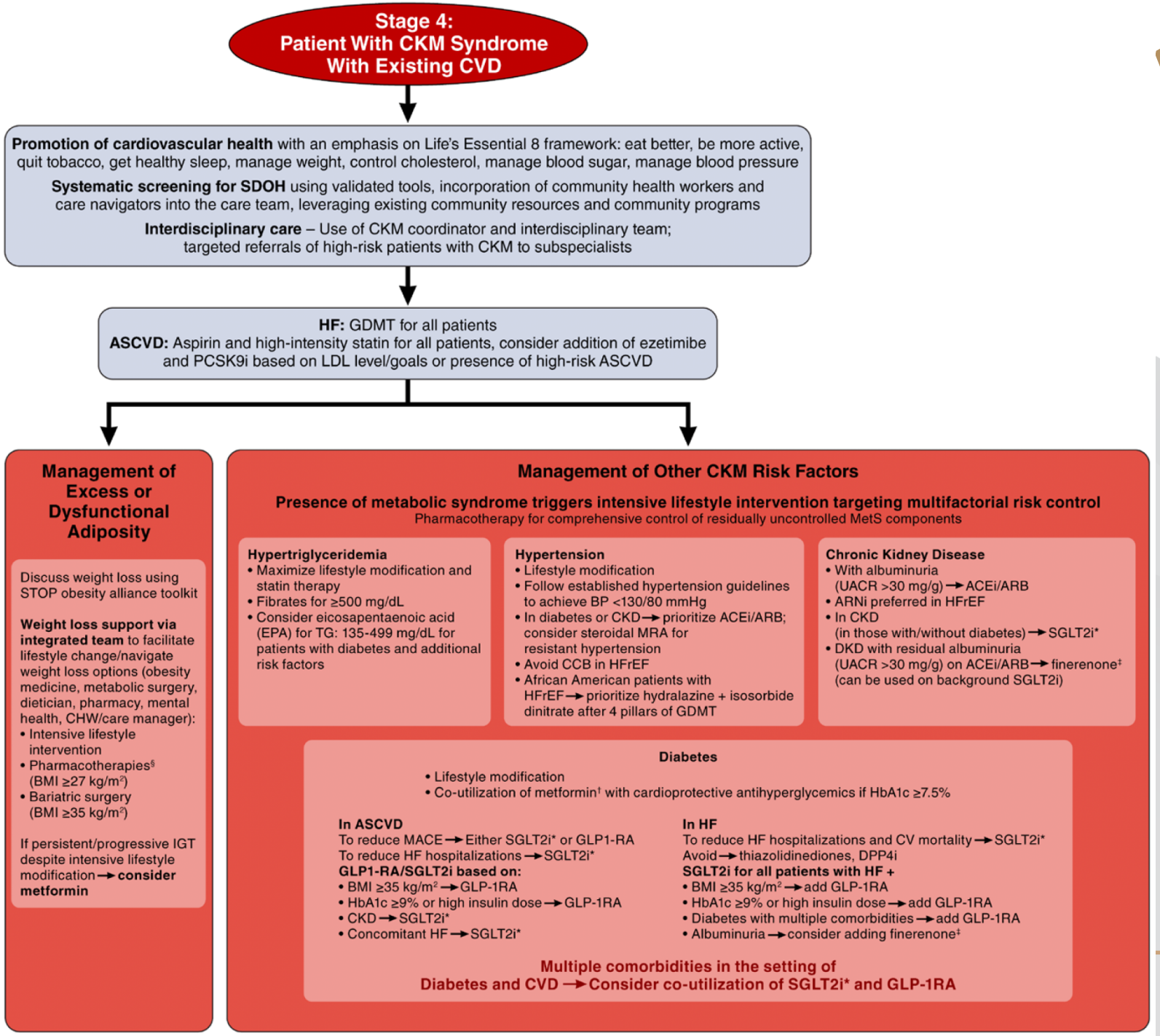
CAC >0
- Favors statin use in intermediate risk

CAC >100
- Favors aspirin use if low bleeding risk
- Favors considering other agents for ASCVD risk reduction (eg, PCSK9i, GLP-1RA, icosapent ethyl) based on CKM profile

Subclinical Heart Failure
- EF <40% → ACEi/ARB, ß-blocker
- In diabetes → SGLT2i†

CVD Risk Equivalents for Stage 3 CKM:
- Very high-risk CKD*
- High predicted CVD risk per risk calculator

Circulation. 2023;148:1606–1635. DOI: 10.1161/CIR.0000000000001184
Front. Cardiovasc. Med. 12:1583702. doi: 10.3389/fcvm.2025.1583702



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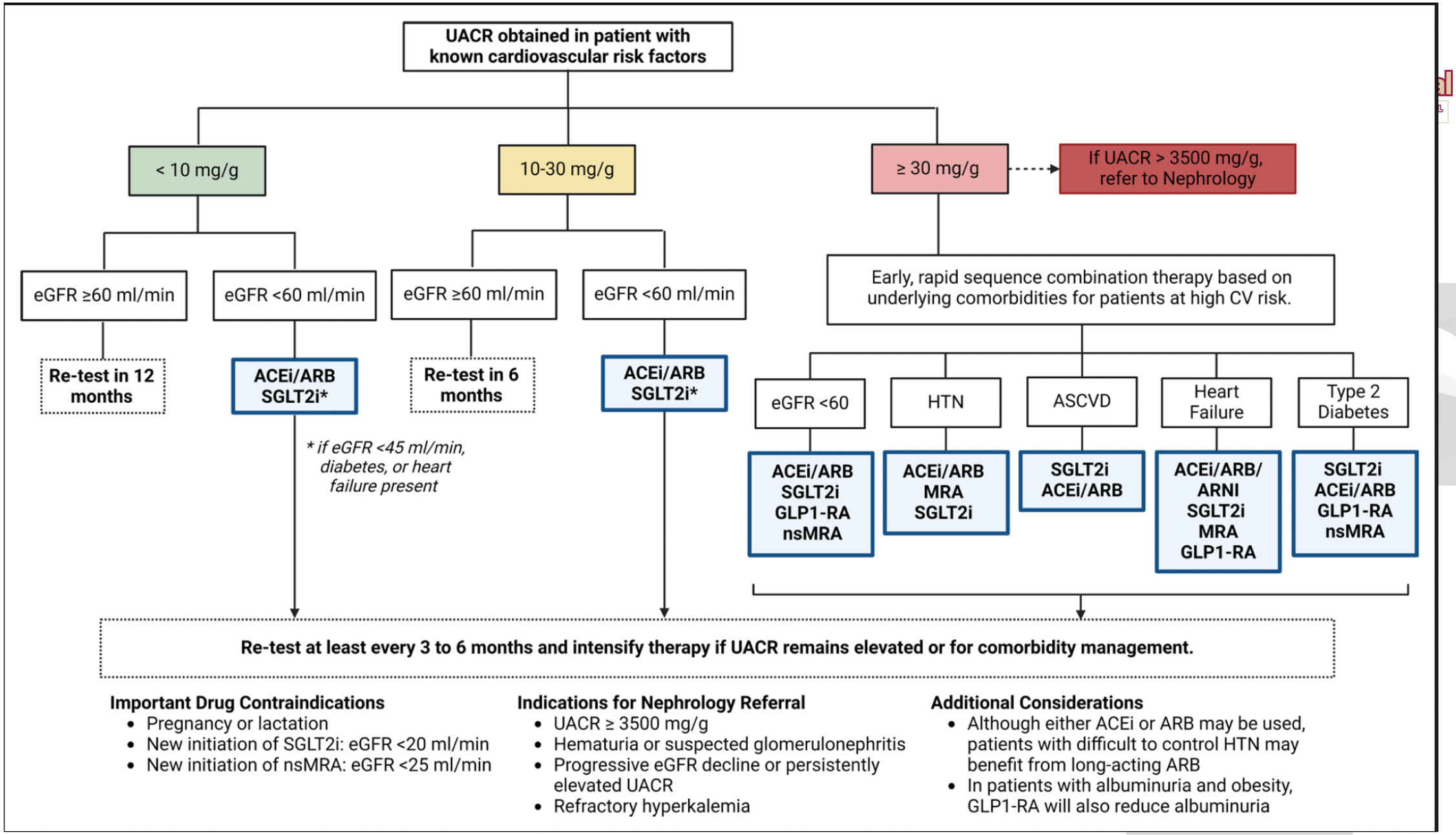

Claudel SE, Verma A. Albuminuria in Cardiovascular, Kidney, and Metabolic Disorders: A State-of-the-Art Review. Circulation. 2025 Mar11;151(10):716-732. doi: 10.1161/CIRCULATIONAHA.124.071079. Epub 2025 Mar 10. PMID: 40063723; PMCID: PMC11902889.

Resultados CV en los estudios

CREEDENCE	TFGe 30-90 ml/min/1.73m2 y ACR 300-500 mg/g
DAPA-CKD	TFGe 25-75 ml/min/1.73m2 y ACR 200-5000 mg/g
EMPA-KIDNEY	TFGe 20-45 ml/min/1.73m2 TFGe 45-90 ml/min/1.73m2 y ACR ≥ 200 mg/g
FIDELIO-DKD	TFGe 25-60 ml/min/1.73m2 y RD TFGe 25-75 ml/min/1.73m2 y ACR 300-5000 mg/ ACR 30-300 mg/g
FIGARO-DKD	TFGe 25-90 ml/min/1.73m2 y ACR 30-300 mg/g TFGe +60 ml/min/1.73m2 y ACR 300-5000 mg/g
FLOW	TFGe 50-75 ml/min/1.73m2 y ACR 300-5000 mg/g TFGe 25-50 ml/min/1.73m2 y ACR 100-5000 mg/g

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Estudios no basados en proteinuria

CANVAS y CANVAS-R	Edad +40 y enfermedad CV previa Edad +50 y factores de riesgo para ECV
SCORED	TFGe 25-60 ml/min/1.73m^2 Edad +18 y con un factor de riesgo CV Edad + 55 y al menos 2 factores de riesgo menores CV (incluyendo ACR 30-300 mg/g)
LEADER	Pxs + 50 y comorbilidades CV Pxs +60 y factores de riesgo CV (proteinuria o microalbuminuria)
PIONEER-6	Pxs +50 y factores de riesgo CV mayores Pxs +60 y factores de riesgo menores CV (incluyendo microalbuminuria o proteinuria)

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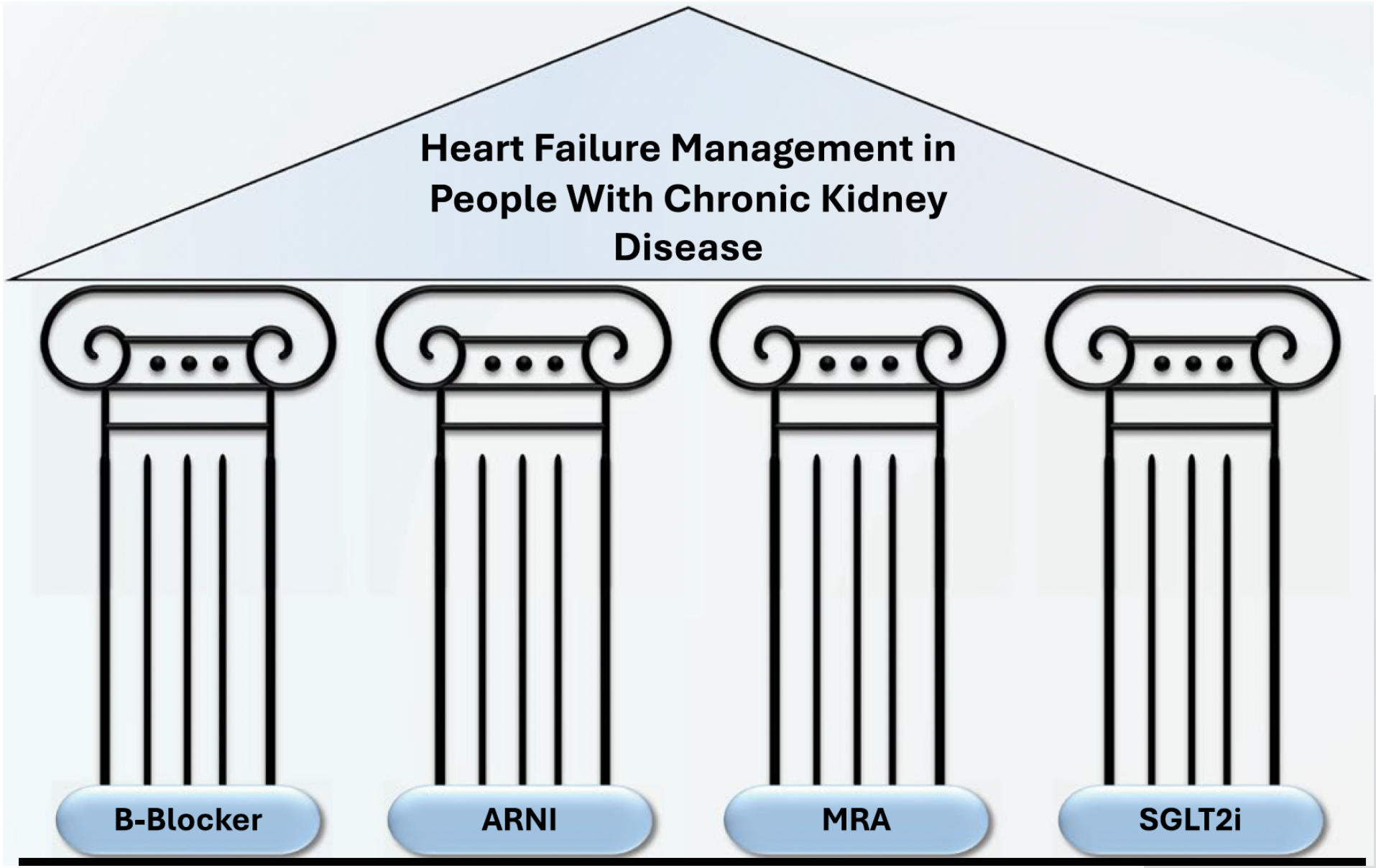
Heart Failure Management in People With Chronic Kidney Disease
B-Blocker
ARNI
MRA
SGLT2i

ATENCIÓN CENTRADA EN EL PACIENTE

Circulation. 2023;148:1606–1635. DOI: 10.1161/CIR.0000000000001184

Conclusiones

- El riesgo inicia desde etapas tempranas de la vida
- Las intervenciones para abordar el contino CRM siguen en expansión.
- La aplicación de las nuevas ciencias ómicas pueden revelar nuevos objetivos en este proceso y mejorar el tratamiento oportuno.
- El abordaje de las vías comunes de las enfermedades CV y renales ayudará a prevenir el efecto adverso por su presencia simultánea.
- Empoderar al paciente y atención centrada en ellos.

“No hay corazón sano con riñones enfermos, ni metabolismo intacto con disfunción orgánica”.

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@imecmty

Referencias

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