Cardiovascular - Kidney - Metabolic Syndrome: diagnosis, progression and practical clinical management

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Disclosure /Conflict of Interests

- No academic, financial and/or commercial conflicts of interest to declare

Cardiovascular – Kidney-Metabolic (CKM) Syndrome Definition

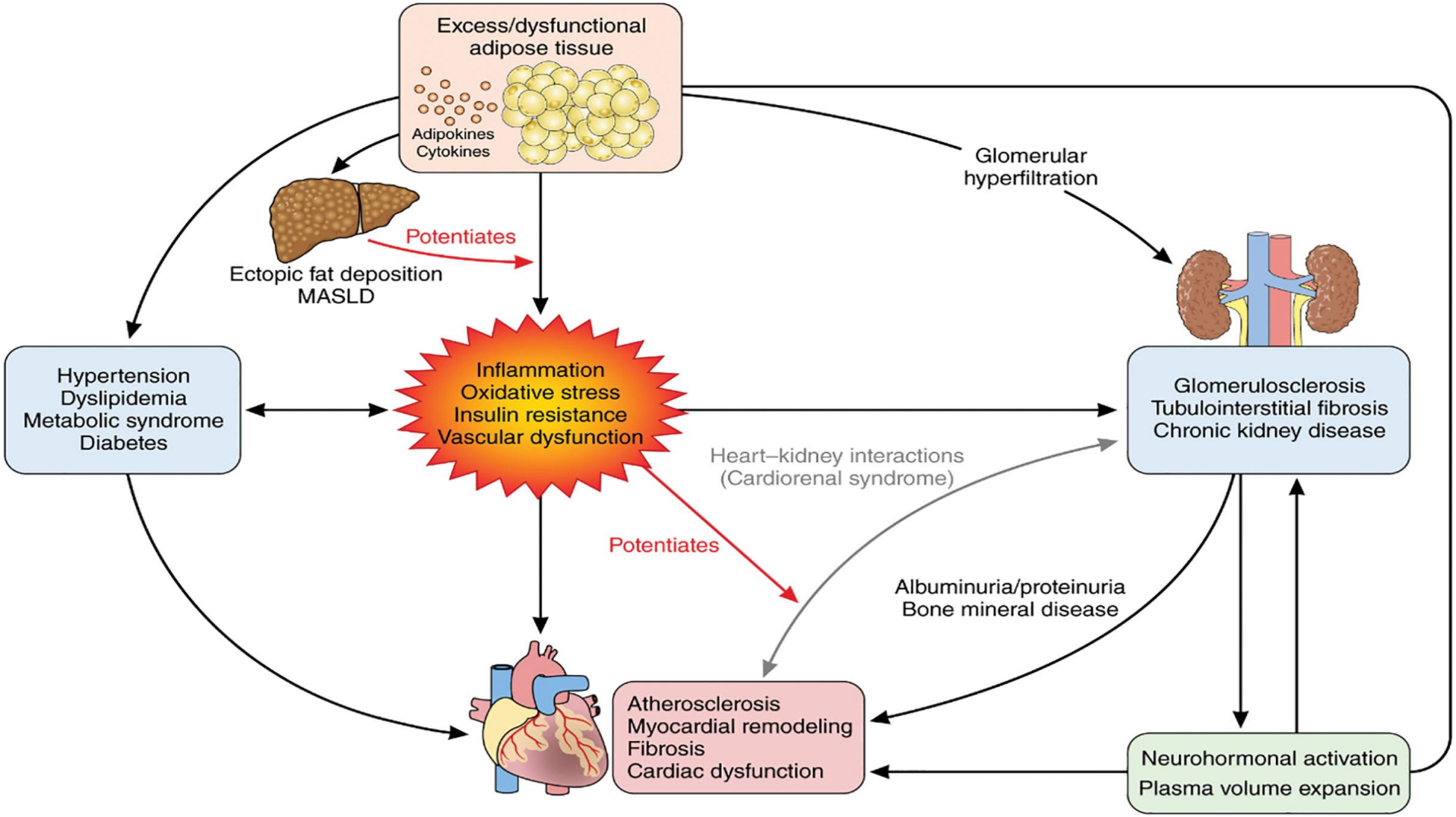
"Cardiovascular kidney metabolic (CKM) syndrome is a health disorder attributable to connexions among obesity, diabetes, chronic kidney disease (CKD) and cardiovascular disease (CVD) leading to poor heath outcomes"

2026 – AHA/ACC/ADA/ASN

Importance

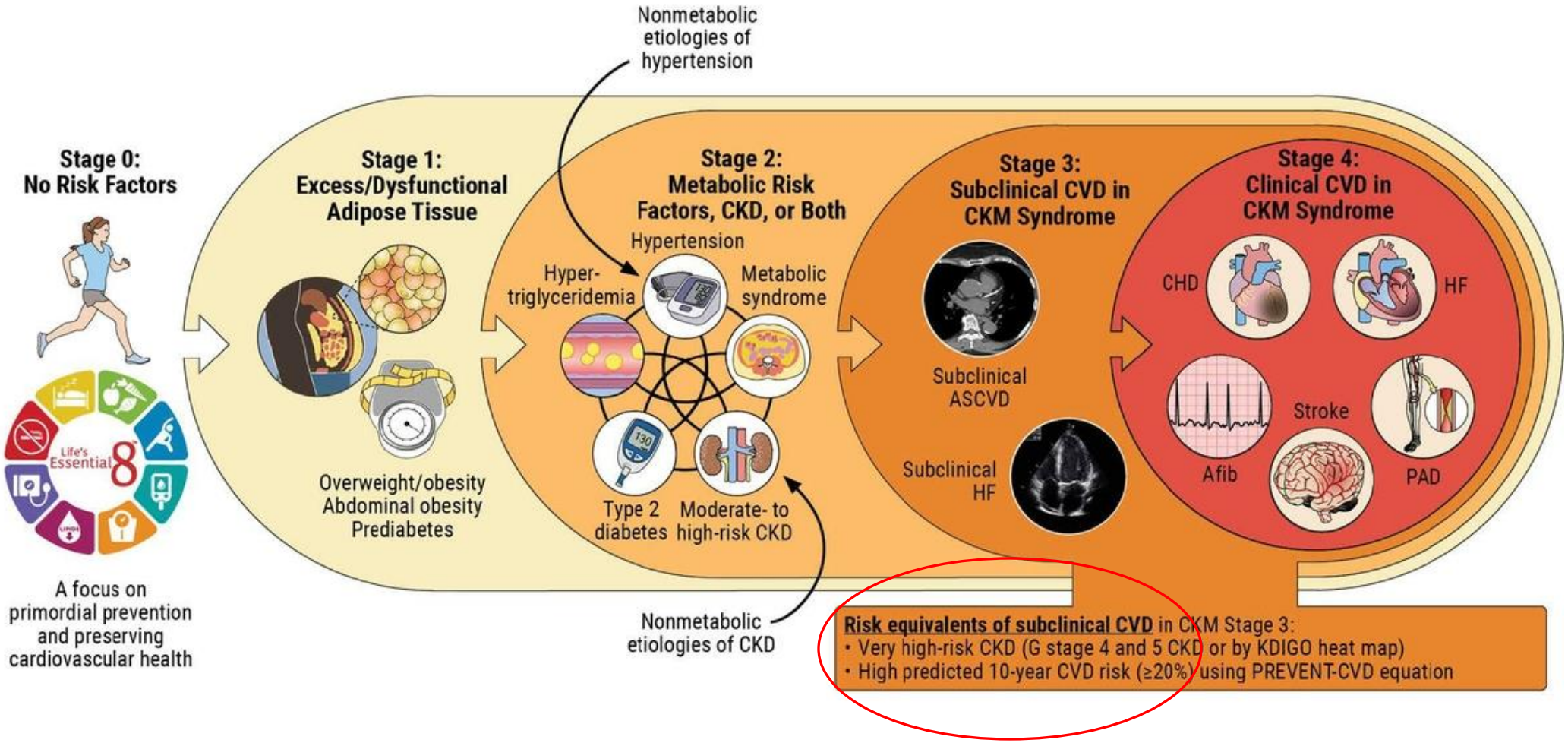
- Provides a broader clinical and pathophysiological model reflecting intertwined pathophysiology
- Integrates dysfunctional adiposity, metabolic dysfunction, CKD and cardiovascular disease within a dynamic multiorgan continuum with progression and potential for regression
- Highlights early renal dysfunction as a marker of increased cardiovascular risk
- Emphases importance of holistic care and of addressing Social Determinants of Health (SDOH)

Conceptual diagram for CKM syndrome

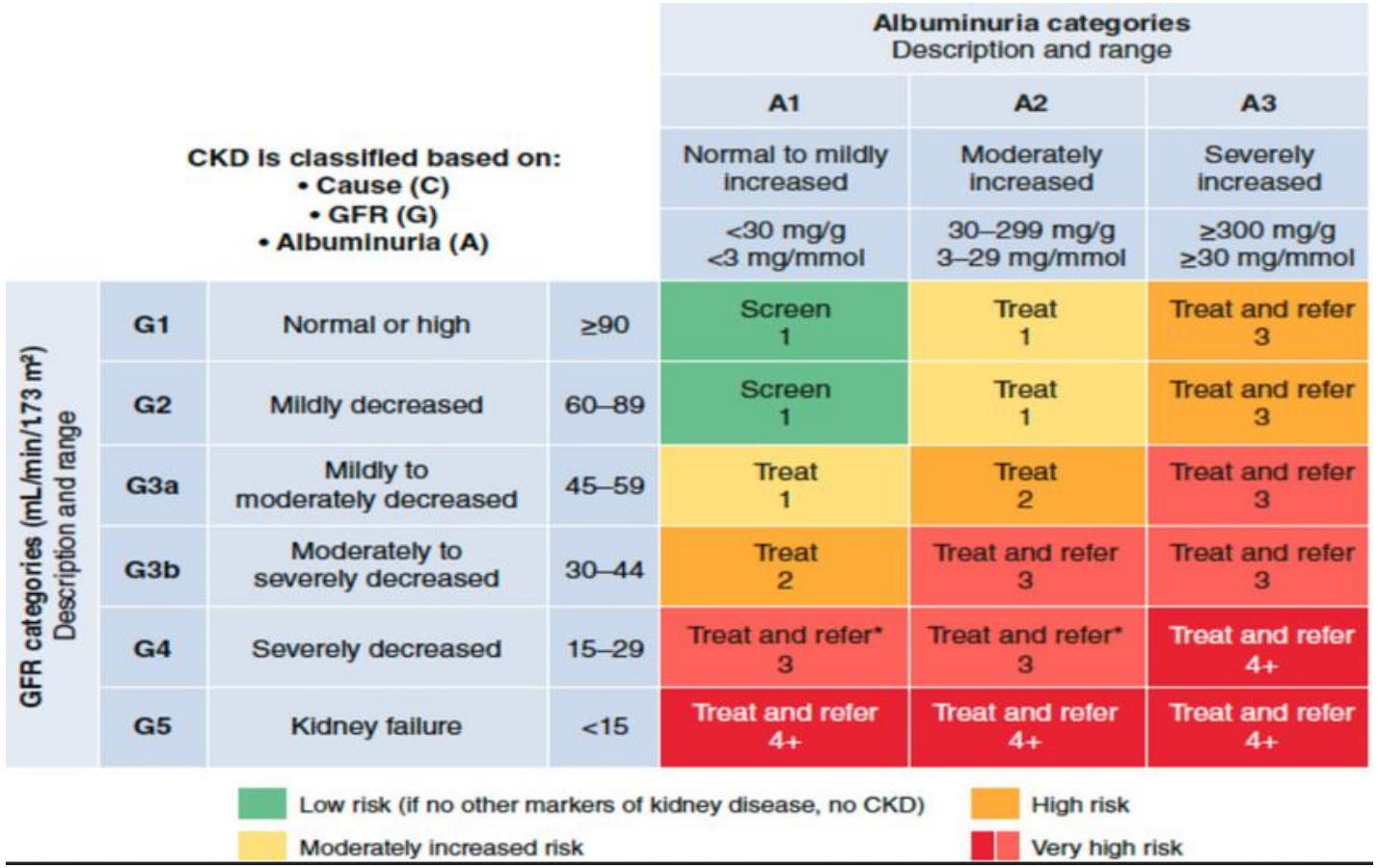


Circulation, 2023

Stages of CKM Syndrome



KDIGO Heatmap: Evaluation, Prognostication and Management of CKD

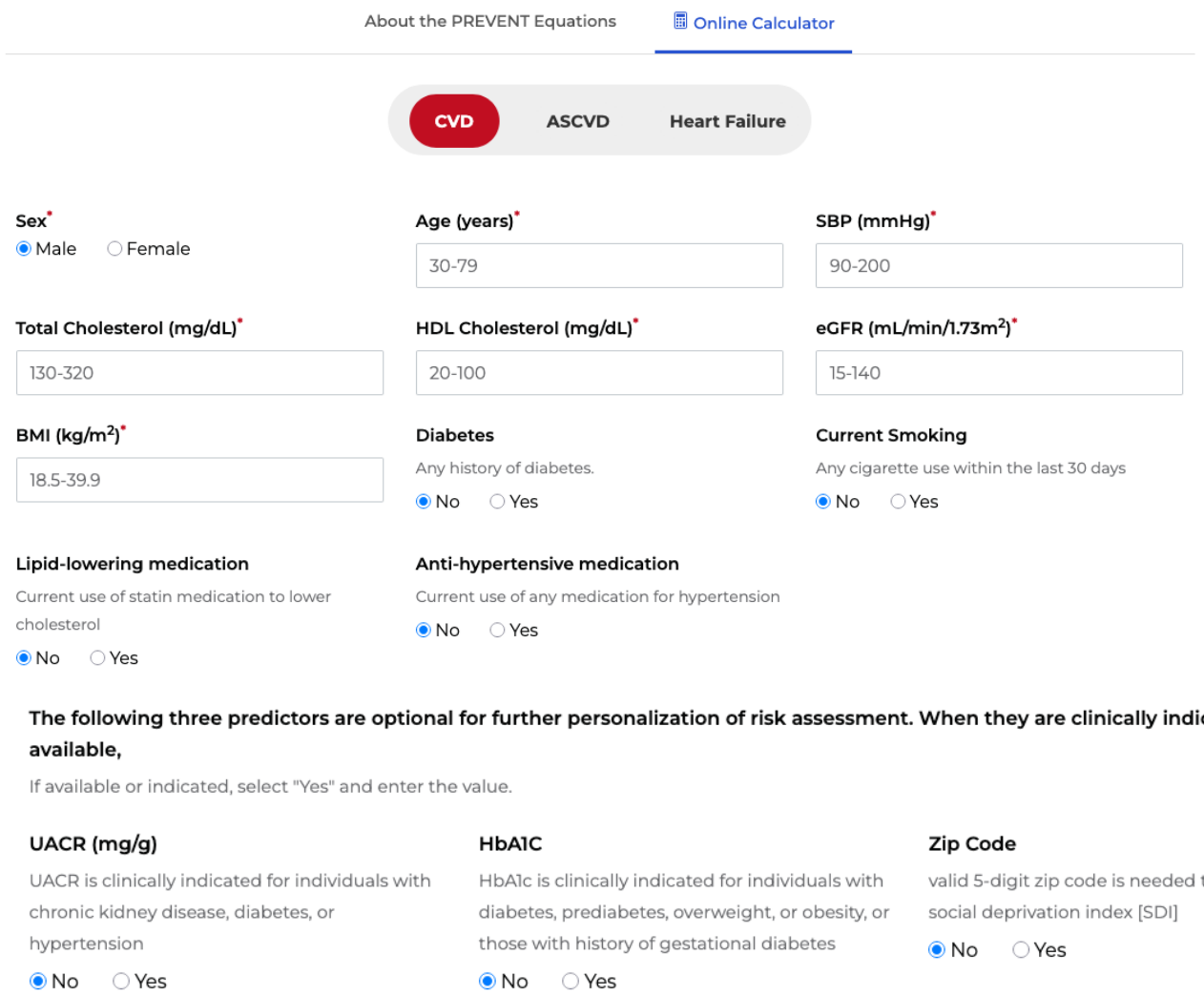


CKD is classified based on: • Cause (C) • GFR (G) • Albuminuria (A)				Albuminuria categories Description and range		
				A1	A2	A3
				Normal to mildly increased	Moderately increased	Severely increased
				<30 mg/g <3 mg/mmol	30–299 mg/g 3–29 mg/mmol	≥300 mg/g ≥30 mg/mmol
GFR categories (mL/min/1.73 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)
Moderately increased risk
High risk
Very high risk

- Both eGFR and UACR needed for diagnosis of CKD
- Informs qualitative Risk
  - Risk of kidney failure
  - CVD events
  - All cause mortality

The American Heart Association PREVENT™ Online Calculator



- Expanded age range 30-79 years
- Expanded outcomes to ASCVD, HF and total CVD
- Assessment of 10 and 30 year risk
- Inclusion of CKM syndrome components

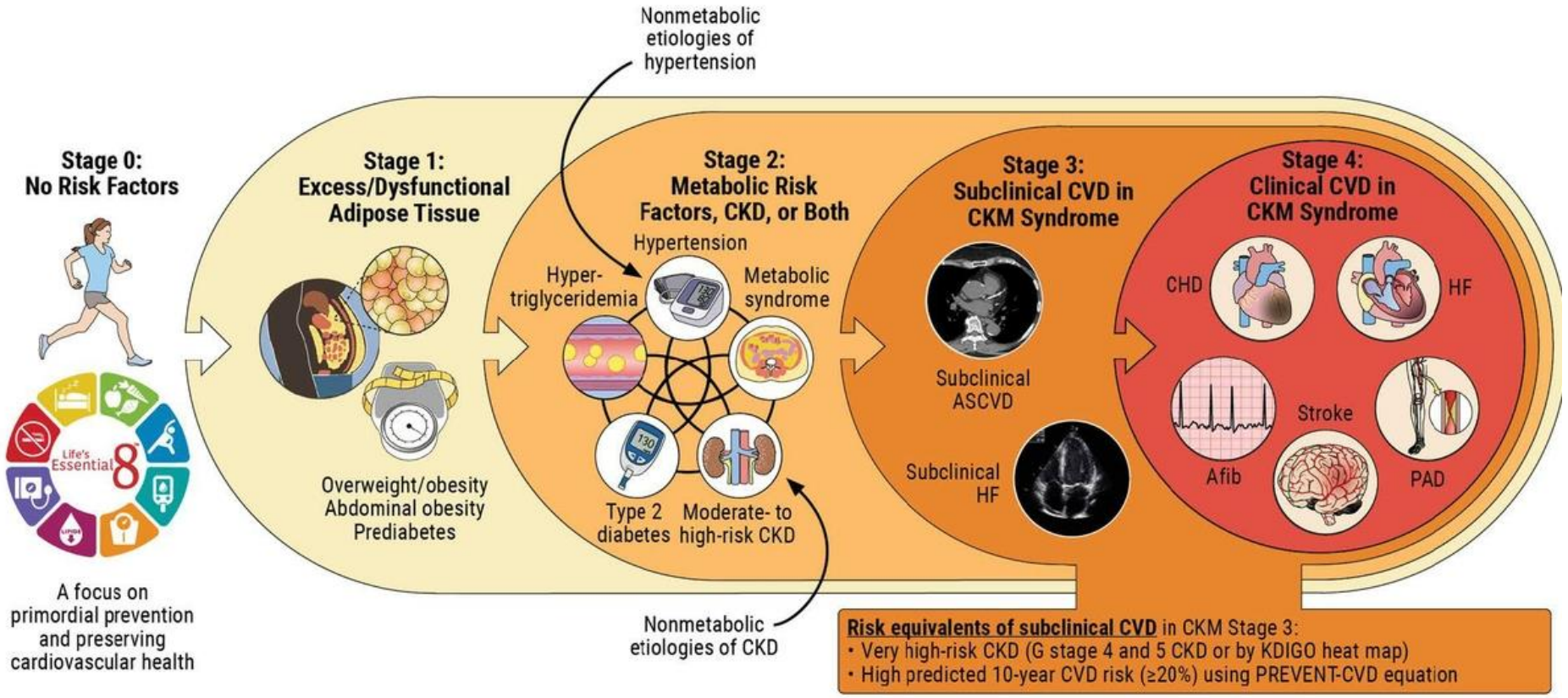
Risk ranges for **ASCVD**

- Low Risk <3%
- Borderline Risk 3 - <5%
- Intermediate Risk 5 - <10%
- High Risk ≥ 10%

Risk enhancing Factors

- High burden of adverse SDOH
- Chronic inflammatory conditions
- Mental health disorders
- Family history of diabetes, CAD ,CKD
- Sleep disorders
- Gender Specific factor
- High-risk demographic (e.g South Asian)

Stages of CKM Syndrome



Preserve Health

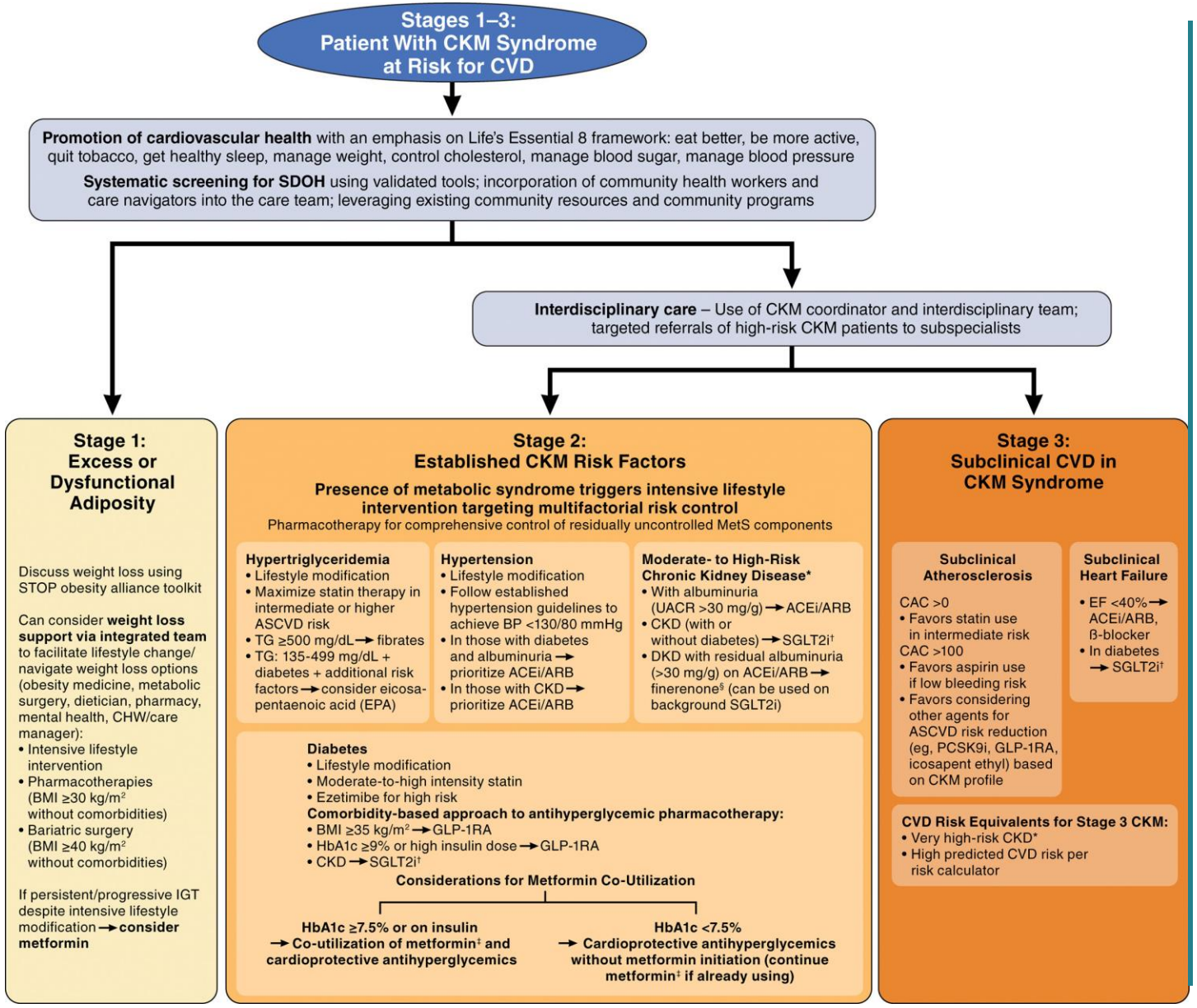
Address obesity to prevent progression

Treat Risk Factors and Protect organs

Intensify treatment to delay progression - promote regression

Secondary Prevention +CKM management

Circulation 2023



How to approach care

Stage 1

- Test for CKM risk factors (Weigh, WC, BMI, BP, FBS, HbA1c, lipids profile, creatinine/eGFR, albuminuria A/C, FIB-4)
- Address overweight -obesity (lifestyle interventions, pharmacotherapy -metabolic surgery)

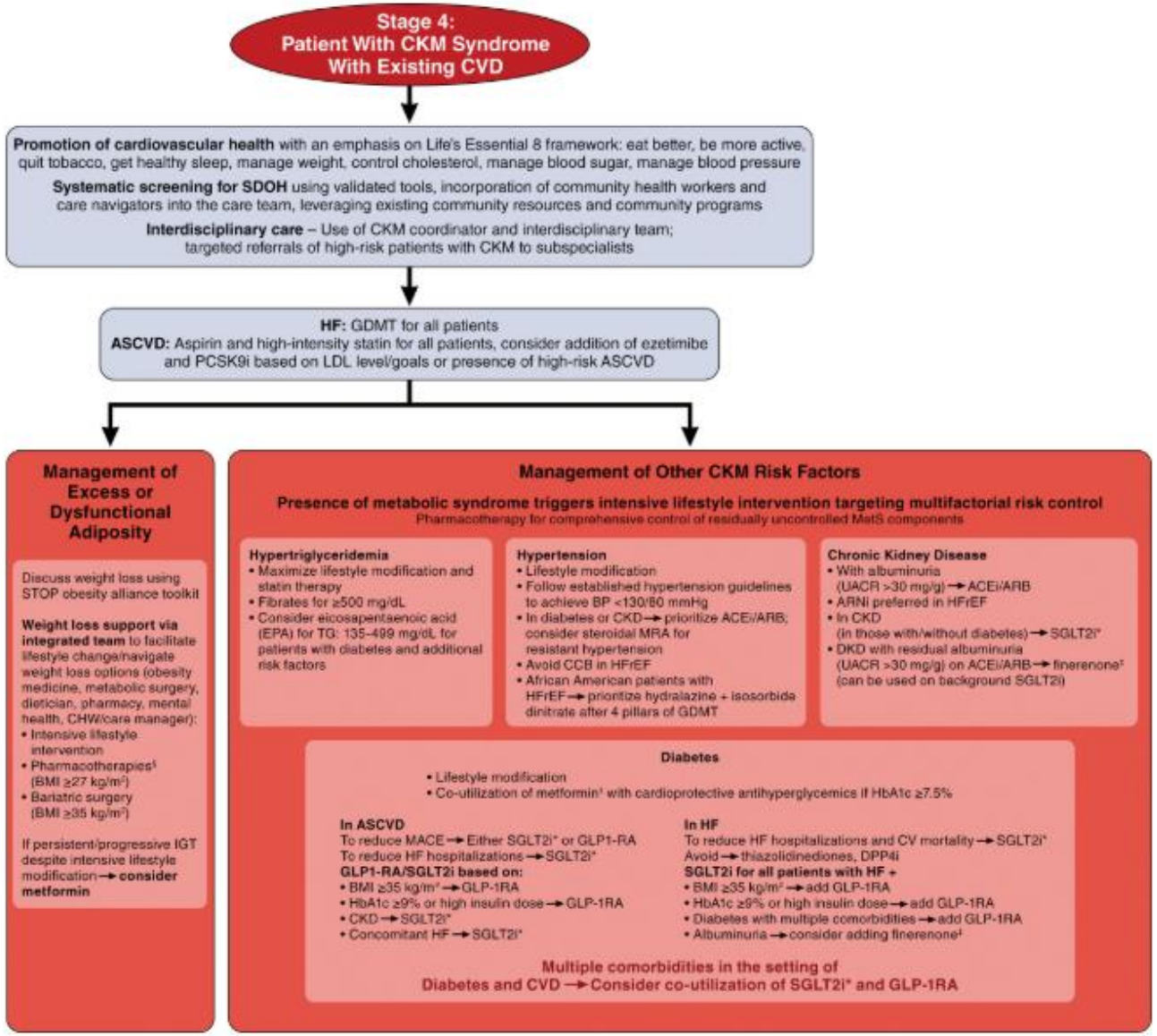
Stage 2

Treat RF with **CKM cardio renal protective therapies**

Stage 3

- **Qualitative Assessment of CVD with PREVENT – KDIGO Heat Map**
- Prevent adverse CV outcomes (HF-CAD-CVA) and progression of CKD with CKM therapies (RASI/GLT21/GLP1RA/nsMRA, lipid lowering agents, metabolic surgery)

All stages: Address SDOH , follow guidelines and offer personalized care



How to approach care

Stage 4 - very high risk group

Secondary prevention addressing all CKM risk factors (obesity – diabetes, HTN, dyslipidemia, CKD and MASLD)

- Monitor progression (weigh, BMI, WC, BP, FBS, HbA1c, lipids profile, creatinine –eGFR, albuminuria, FIB-4)
- Use CKM cardio- renal protective medication

CKM therapies

RASI/GLT21/GLP1RA/nsMRA, lipid lowering agents, HF - GDT, metabolic surgery)

Address SDOH , follow guidelines and offer personalized care

Obesity treatment: beyond weigh management also cardio renal risk modification

- GLP-1 RA cv events reduction, reduce weigh and diabetes control
- SGLT2i strongest evidence for hf and CKD protection

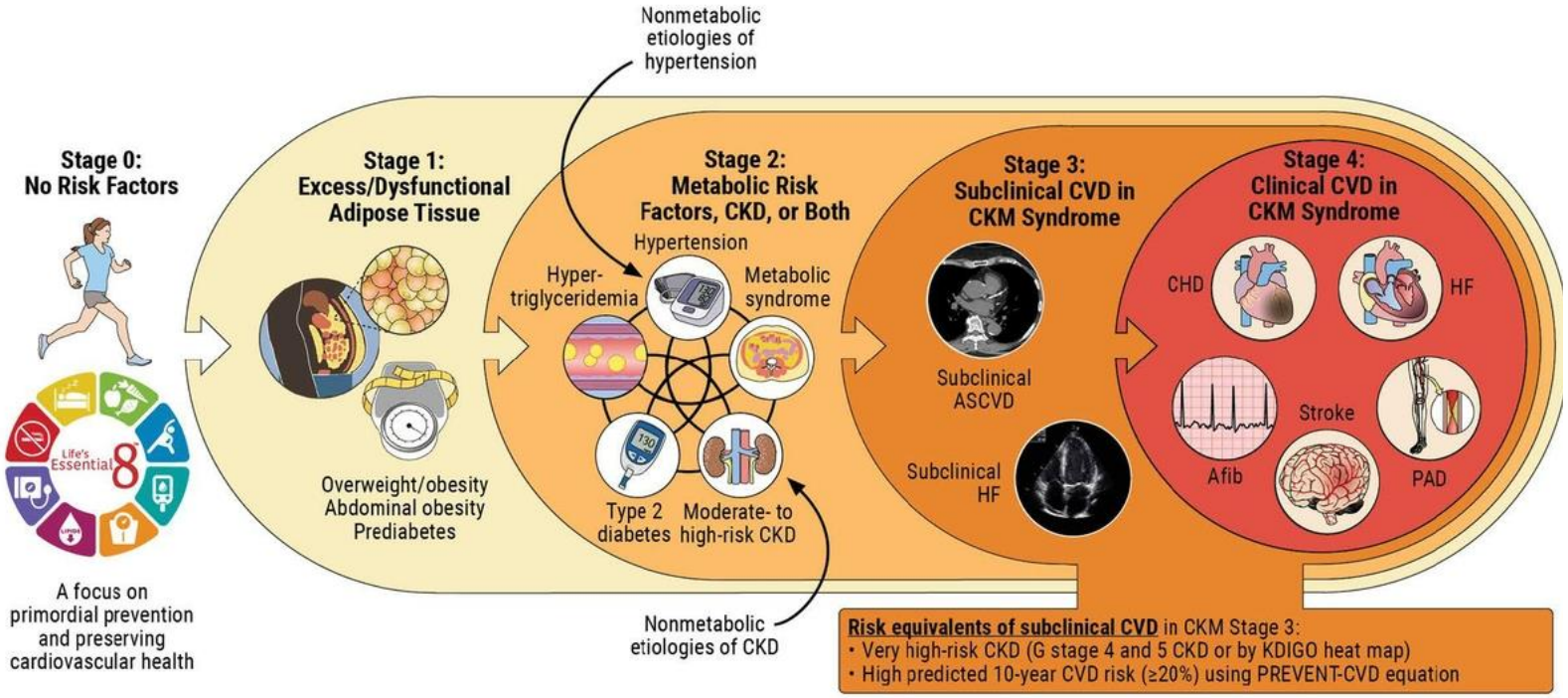
SGLT2i as the new ACE/ARBs

GLP-1 as the new statins

(Select 2023, Flow 2024, Summit 2025, DAPA-CKD 2020, Surpass-CVOT 2026)

JACC. 2026 Guideline for prevention, detection, evaluation and management of CKM Syndrome.

Liver: Advocating to include MASLD –identical physiopathology

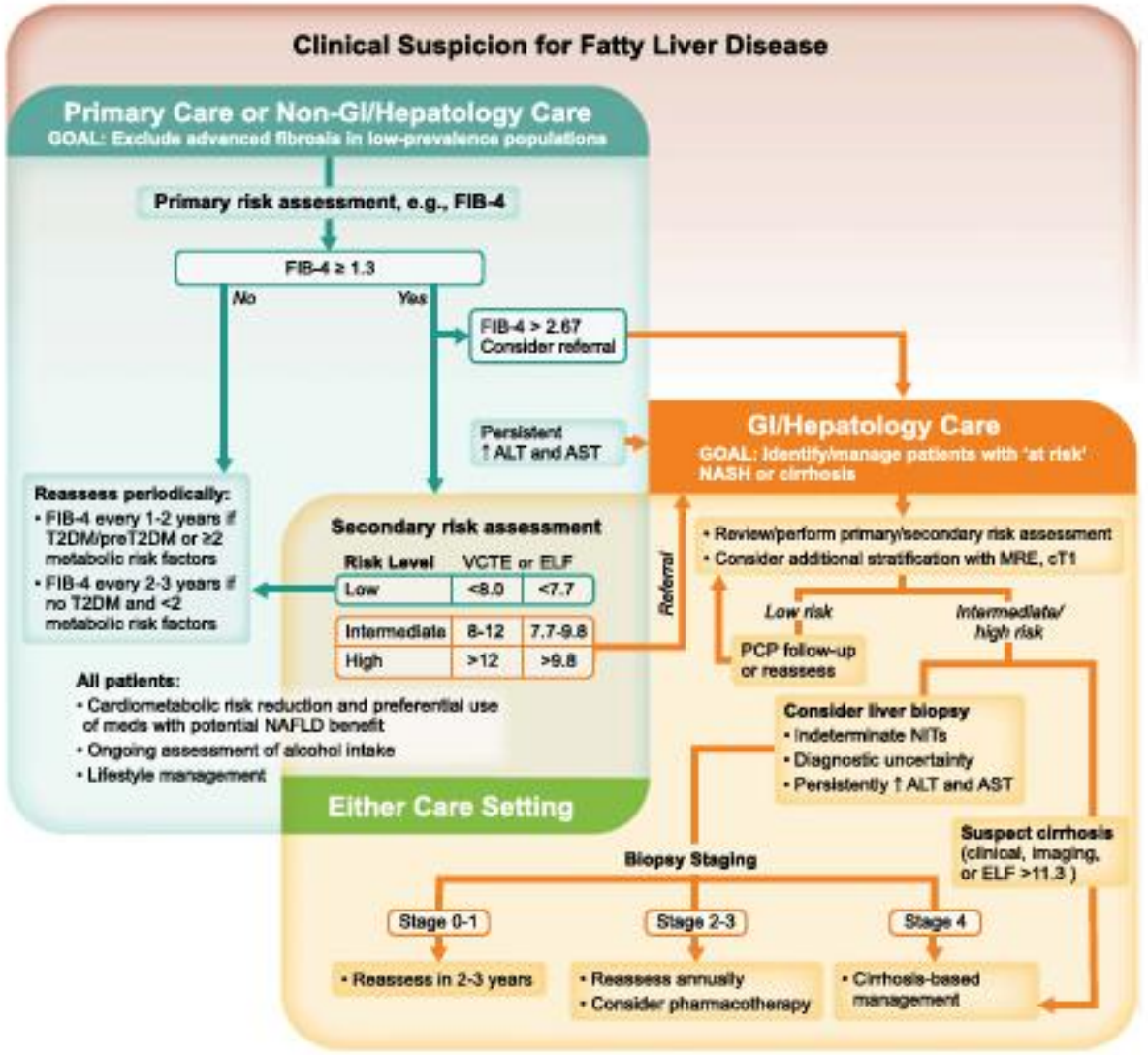


- Leading cause of cirrhosis and liver transplant
- High prevalence in overweigh – obese and diabetic population
- New screening tools **FIB-4 and ELF**
- Promising Therapeutics

MASLD | MASLD with fibrosis Stage 0-1 | MASLD with fibrosis Stage 2-4 | Cirrhosis

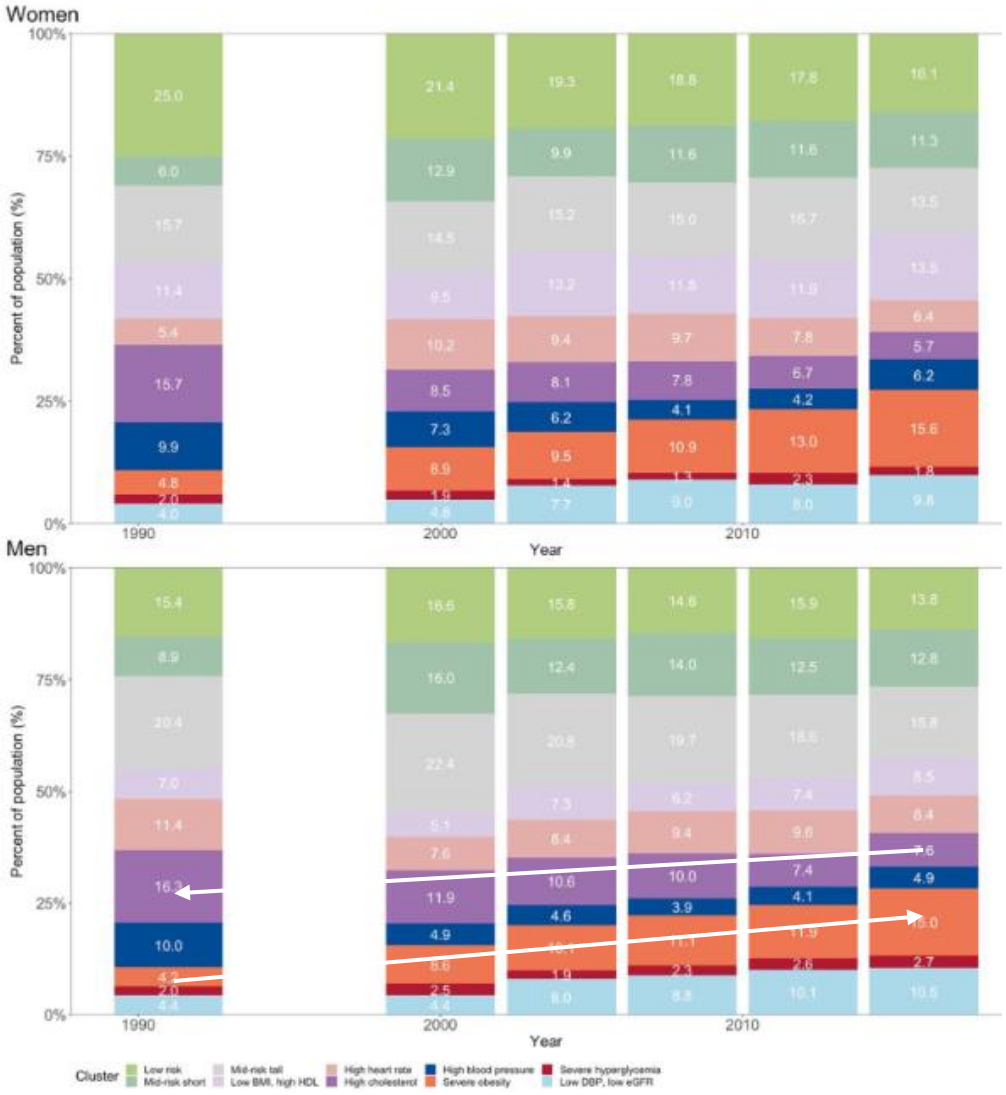
Biomolecules 2025

AASLD Practice Guidelines on the clinical assessment and management of non alcoholic fatty liver disease. Hepatology 2023



Cardiometabolic phenotype transitions - USA

Lhoste et al. Nature Cardiovascular Research 2024



Hypertension
Dyslipidemia

Obesity
CKF

CENTRAL ILLUSTRATION: 2026 ACC Cardiovascular-Kidney-Metabolic-Syndrome Guideline-at-a-Glance

Cardioprotection in CKM Syndrome

Chronic Kidney Disease	Type 2 Diabetes
• eGFR <60 mL/min/1.73 m^2 and/or • UACR ≥30 mg/g	• Fasting plasma glucose ≥126 mg/dL or • HbA1c ≥6.5%

Use cardioprotective agents in CKM syndrome management

• Utilize RASi and SGLT2i • If T2D and persistent albuminuria add GLP-1RA or nsMRA • Recheck UACR every 3-6 mo	• Utilize GLP-1-based therapy and/or SGLT2i • Assess glycemic status every 3-6 mo

Panjrath GS, et al. JACC. 2026;10.1016/j.jacc.2026.05.008.

Take home points:

- CKM syndrome reflects interplay among obesity, metabolic risk factors, CKD and CVD
- New framework reinforces need to:
  - **Address obesity/overweight** in a non judgemental manner – **treat RF**
  - **Stage patients** (0 to 4) and quantify CV risk by using PREVENT-KDIGO map
  - **Address SDOH**
  - Provide a **holistic coordinated care**
  - **Utilize CKM therapies** including **lifestyle interventions**, **pharmacotherapy** (GLP-1 RA, SGLT2i, RAASI, nsMRA, lipid lowering agents) and **metabolic surgery to halted progression/promote regression**

XXIX IFSO World Congress

1-4 September 2026 | Toronto, Canada

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The Future of Obesity Management:
From Weight Loss to Health Gain