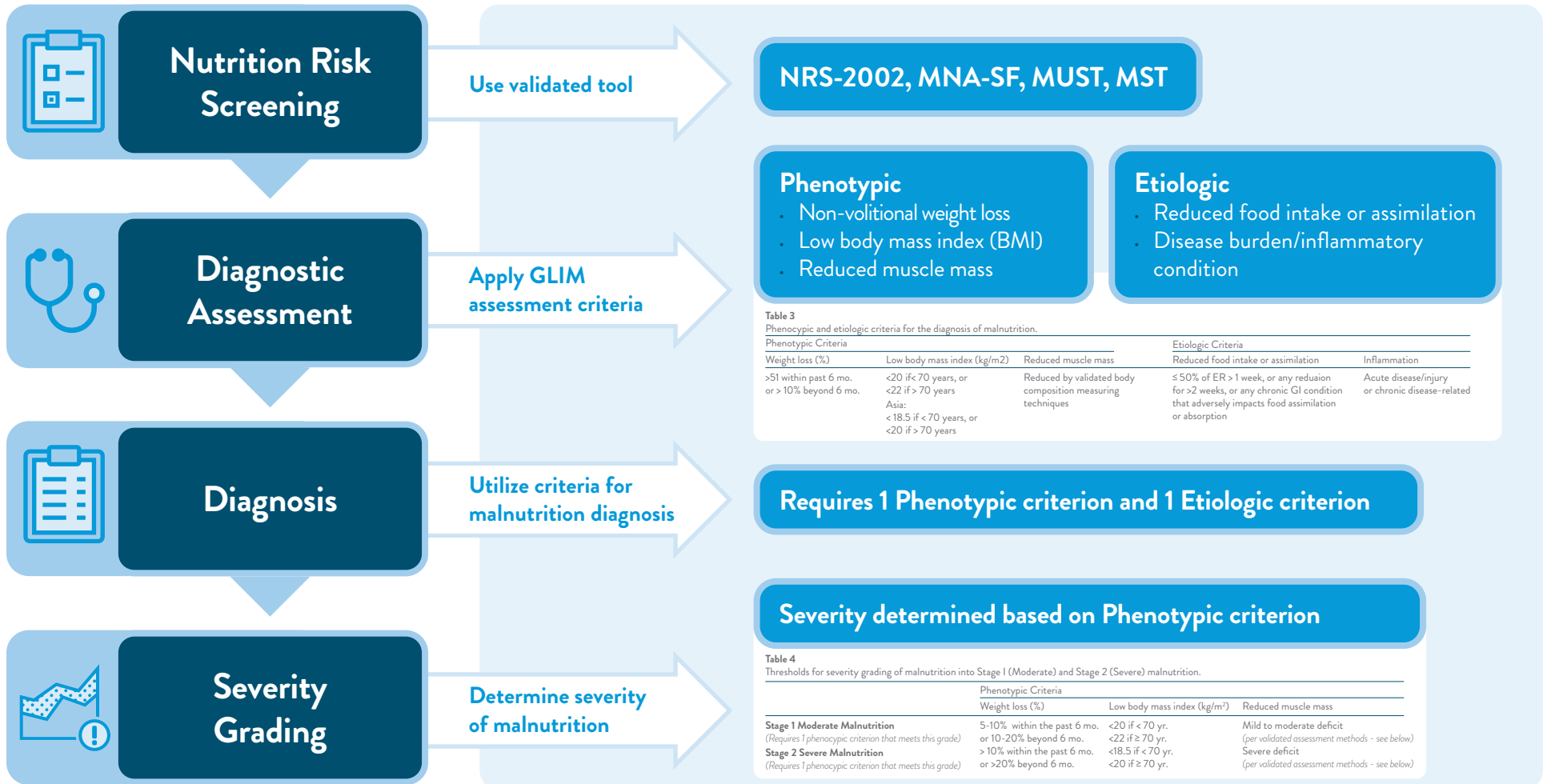# GLOBAL LEADERSHIP INITIATIVE ON MALNUTRITION (GLIM) FRAMEWORK FOR MALNUTRITION SCREENING, ASSESSMENT, DIAGNOSIS AND SEVERITY GRADING

A core leadership committee with representatives of global clinical nutrition societies (ASPEN, ESPEN, FELANPE, PENSA) established a consensus around core diagnostic criteria for malnutrition in adults in clinical settings

Nutrition Risk Screening

Use validated tool

NRS-2002, MNA-SF, MUST, MST

Diagnostic Assessment

Apply GLIM assessment criteria

Phenotypic
- Non-volitional weight loss
- Low body mass index (BMI)
- Reduced muscle mass

Etiologic
- Reduced food intake or assimilation
- Disease burden/inflammatory condition

Table 3
Phenocypic and etiologic criteria for the diagnosis of malnutrition.

Phenotypic Criteria			Etiologic Criteria	
Weight loss (%)	Low body mass index (kg/m2)	Reduced muscle mass	Reduced food intake or assimilation	Inflammation
>51 within past 6 mo. or > 10% beyond 6 mo.	<20 if< 70 years, or <22 if > 70 years Asia: < 18.5 if < 70 years, or <20 if > 70 years	Reduced by validated body composition measuring techniques	≤ 50% of ER > 1 week, or any reduaion for >2 weeks, or any chronic GI condition that adversely impacts food assimilation or absorption	Acute disease/injury or chronic disease-related

Diagnosis

Utilize criteria for malnutrition diagnosis

Requires 1 Phenotypic criterion and 1 Etiologic criterion

Severity Grading

Determine severity of malnutrition

Severity determined based on Phenotypic criterion

Table 4
Thresholds for severity grading of malnutrition into Stage I (Moderate) and Stage 2 (Severe) malnutrition.

	Phenotypic Criteria		
	Weight loss (%)	Low body mass index (kg/m²)	Reduced muscle mass
Stage 1 Moderate Malnutrition *(Requires 1 phenocypic criterion that meets this grade)*	5-10% within the past 6 mo. or 10-20% beyond 6 mo.	<20 if < 70 yr. <22 if ≥ 70 yr.	Mild to moderate deficit *(per validated assessment methods – see below)*
Stage 2 Severe Malnutrition *(Requires 1 phenocypic criterion that meets this grade)*	> 10% within the past 6 mo. or >20% beyond 6 mo.	<18.5 if < 70 yr. <20 if ≥ 70 yr.	Severe deficit *(per validated assessment methods – see below)*

Cederholm T, et al. *J Cachexia Sarcopenia Muscle.* 2019;10(1):207-217.

ASPEN- American Society for Parenteral and Enteral Nutrition
ESPEN- European Society for Clinical Nutrition and Metabolism
FELANPE- Latin American Federation of Nutritional Therapy, Clinical Nutrition and Metabolism
GI- Gastrointestinal

PENSA- The Parenteral and Enteral Nutrition Society of AsiaNRS-2002- Nutritional Risk Screening
MNA-SF- Mini Nutritional Assessment Short Form
MUST- Malnutrition Universal Screening Tool
MST- Malnutrition Screening Tool

HOW TO ASSESS SKELETAL MUSCLE MASS AS PART OF GLIM DIAGNOSIS OF MALNUTRITION

The GLIM consortium appointed a working group to provide consensus-based guidance on assessment of skeletal muscle mass:

- Use DXA, CT, BIA or US when such methods and skills are available
- If DXA, CT, BIA or US are not available, then use anthropometric measures (calf circumference, MUAC) and physical examination

Measurements of muscle function (handgrip, knee- extension sit-to-stand, 4-m walking test) are **not recommended** as surrogates or proxies for muscle mass as they may be adversely impacted by nonnutrition factors

Once malnutrition is diagnosed, skeletal muscle function should be investigated as a relevant component of nutrition assessment of individuals with malnutrition

MALNUTRITION DIAGNOSIS (using the GLIM approach)

Five GLIM Criteria

Phenotypic criteria
- Weight Loss
- Low BMI
- Low skeletal muscle mass

Etiologic criteria
- Low food Intake or assimilation
- Disease burden or inflammation

Muscle mass assessment

Technical Approaches
- BIA
- DXA
- CT
- US

Any available with appropriate expertise and reference values? → NO → YES

Clinical Approaches
- Anthropometry
  - Calf circumference
  - Mid-upper arm circumference
- Physical Examination
  - Signs of reduced muscle mass at the temple, neck, clavicle, shoulder, scapula, thigh and calf

YES

Low muscle mass identified?

Monitor ← YES

Malnutrition diagnosis confirmed?

YES

Comprehensive nutritional assessment & evaluation of muscle strength / function

Barazzoni R, et al. Clin Nutr. 2022;41(6):1425-1433.

DXA- Dual-Energy X-ray Absorptiometry
CT- Computerized Tomography
BIA- Bioelectrical Impedance Analysis

US- Ultrasound
MUAC- Mid-Upper Arm Circumference

ANHI
ABBOTT NUTRITION HEALTH INSTITUTE

Abbott