

Understanding METABOLIC SYNDROME in Children

EARLY RECOGNITION • HEALTHY HABITS • LIFELONG HEALTH

A cluster of risk factors that increase a child's chance of developing diabetes, heart disease, fatty liver and other serious health problems.



WHAT IS IT?

Metabolic syndrome (MetS) happens when a child has three or more risk factors that affect the body's metabolism. It is strongly linked to insulin resistance and obesity, especially belly (abdominal) fat.

WHY IT MATTERS



Tracks into adulthood and increases the risk of heart disease, stroke and type 2 diabetes.



Associated with fatty liver disease (NAFLD) and high blood pressure.



Early intervention can prevent or reverse many complications.

COMMON COMPONENTS

A child may have three or more of the following:



Abdominal obesity (large waist size for age/sex)



High blood pressure



High triglycerides



Low HDL ("good") cholesterol



High blood sugar (insulin resistance)

WHO IS AT RISK?

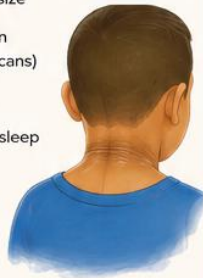
- Overweight or obese children
- Family history of type 2 diabetes, high blood pressure or heart disease
- Physical inactivity
- Diet high in sugary drinks, fast food and processed foods
- Poor sleep or sleep apnea
- Certain medical conditions or medications



WARNING SIGNS

Many children have no symptoms. Look for:

- ✓ Rapid weight gain
- ✓ Increased waist size
- ✓ Dark, velvety skin (acanthosis nigricans)
- ✓ Fatigue
- ✓ Snoring or poor sleep



SCREENING & EVALUATION

Who to Screen

- Children ≥ 95 th percentile BMI
- Overweight (85th–94th percentile BMI) with risk factors
- Family history of diabetes, early heart disease, or fatty liver
- Acanthosis nigricans, hypertension, dyslipidemia or PCOS

What to Check



Height, weight, BMI percentile



Waist circumference



Blood pressure



Lab tests:
Fasting lipids • Fasting glucose
HbA1c • Liver enzymes (ALT, AST)
Consider fasting insulin in select cases



Additional tests as indicated:
Liver ultrasound • Sleep study

EVIDENCE-BASED RECOMMENDATIONS



HEALTHY EATING

Follow a balanced, nutrient-rich diet: more fruits, vegetables, whole grains, lean proteins, healthy fats and water. Limit sugary drinks, junk food and highly processed foods.



BE ACTIVE

At least 60 minutes of moderate-to-vigorous activity every day. Include muscle-strengthening activities 3 days per week.



SLEEP WELL

Children 9–12 hrs, Teens 8–10 hrs of quality sleep each night. Good sleep improves hormone balance and insulin sensitivity.



FAMILY-FOCUSED APPROACH

Healthy changes work best when the whole family participates together.



ACHIEVE & MAINTAIN A HEALTHY WEIGHT

Even 5–10% improvement in weight can improve blood pressure, lipids, blood sugar and liver health.

POSSIBLE COMPLICATIONS



Type 2 diabetes



High blood pressure



Fatty liver disease



Early heart disease and stroke



Polycystic ovary syndrome (PCOS)



Kidney disease



Sleep apnea

TREATMENT OPTIONS

Lifestyle modification is the foundation. Medications may be considered in selected children when lifestyle changes alone are not enough.

Medications (as appropriate):

- Blood pressure medications
- Statins for persistent dyslipidemia
- Metformin for insulin resistance/prediabetes
- Anti-obesity medications in eligible adolescents with specialist supervision

Bariatric surgery may be considered for carefully selected adolescents with severe obesity and complications.



SAFETY PEARLS

- ✓ Always interpret labs and blood pressure based on age, sex and pubertal stage.
- ✓ Rule out secondary causes of obesity, hypertension or dyslipidemia.
- ✓ Avoid weight stigma—focus on healthy behaviors, not blame.
- ✓ Address mental health, screen time, and social determinants of health.
- ✓ Coordinate care with a multidisciplinary team when needed.

HEALTHY KIDS TODAY. STRONG HEARTS TOMORROW.



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