



Treatment Pearls ^{1,4}

- P1.** Include waist circumference as a routine part of usual clinical practice.
- P2.** Educate patients about the risks of increased BMI (especially if BMI >25).
- P3.** The foundation of metabolic syndrome should be lifestyle changes aimed to decrease weight and increase physical activity.
- P4.** Treat patients with Metabolic Syndrome aggressively with lifestyle modifications and/or medication therapy to decrease risk factors and achieve goal levels for comorbidities (i.e., HTN and dyslipidemia).

Physicians Plus Supports Healthy Lifestyle Modifications

- ❖ Members can be reimbursed up to \$100 annually for an approved nutrition or exercise class at Meriter Hospital, UW-Health, UW-Hospital, or other participating hospitals. (refer patient to https://www.pplusic.com/members/HL_bonus.htm for more information)
- ❖ Plus Perks Program with a Physicians Plus health plan membership entitles the member to discounts from participating businesses on health club and sports facility memberships. (refer patient to <https://www.pplusic.com/members/Plus%20Perks%20Index.htm> for more information)

In the event that the patient does develop diabetes mellitus, there are multiple medications to choose from in order to treat the patient

See Plus Pearls Diabetes One for helpful info about

1. Sulfonylureas
2. Biguanide therapy
3. Thiazolidinediones

See Plus Pearls Diabetes Two for helpful info about

1. Insulin

Aggressive Treatment of Hypertension and Cholesterol in Metabolic Syndrome Patients

Hypertension

JNC 7 Guidelines discuss classification and management of blood pressure for adults.⁶

Lifestyle Modifications for Hypertension ⁶

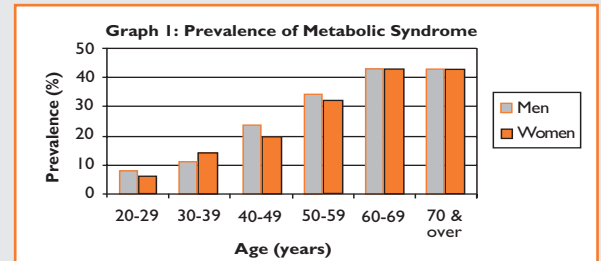
- Weight Reduction
- Adopt DASH eating plan
- Dietary sodium reduction
- Physical activity
- Moderation of alcohol consumption

Physicians Plus Hypertensive Medications on Formulary

- **Angiotensin-Converting Enzyme (ACE) Inhibitor**
Benazepril, benazepril/ HCTZ, captopril, enalapril, lisinopril, Altace (requires PA)
- **Antidrenergic**
Clonidine tabs, doxazosin, guanfacine, methylodopa, prazosin
- **Angiotensin II Receptor Antagonist (ARB)**
Cozaar, Hyzaar; Benicar, Benicar/HCTZ
- **Beta Blockers**
Acebutolol, atenolol, labetalol, metoprolol, nadolol, pindolol, propranolol, Innopran XL, Coreg, Toprol XL (requires PA)
- **Calcium Channel Blocker**
Diltiazem, diltiazem SR, nifedipine ER, felodipine, verapamil, verapamil SR tablets, Norvasc
- **Diuretics and Combination Diuretics**
Furosemide, hydrochlorothiazide, spironolactone, spironolactone/HCTZ, triamterene, triamterene/HCTZ, metolazone

Background

- ❖ Metabolic Syndrome combines characteristics of central obesity, atherogenic dyslipidemia (especially low HDL cholesterol and high triglycerides), insulin resistance, hypertension, prothrombotic state, and proinflammatory state.^{1,2}
- ❖ Metabolic Syndrome is also known as Dysmetabolic Syndrome, Syndrome X or Insulin Resistance Syndrome.¹
- ❖ **Underlying Causes** ^{1,2,4}
 - Insulin resistance
 - Lifestyle: overweight and/or sedentary
 - Genetic: predisposition to insulin resistance
- ❖ **Major Risk Factors for Metabolic Syndrome** ^{1,2,3,4}
 - Age
 - Prevalence increases with age (see Graph 1 below)
 - After age adjustment, the prevalence of metabolic syndrome was 24% in individuals ≥ 20 years (20-70 years)
 - Obesity
 - Body Mass Index (BMI) <25 (healthy); 25-29 (overweight); 30 (obese)
 - <10% of patients with healthy BMI have metabolic syndrome
 - 40-50% of patients with BMI>35 have metabolic syndrome
 - Patients with more central obesity (apple-shaped body) have an increased risk
 - Other Risk Factors to Consider
 - Medical History: Gestational diabetes or family history of Type II Diabetes
 - Concurrent Disease States: Hypertension, Dyslipidemia
 - Ethnicity: Greater prevalence in Mexican-Americans



Metabolic Syndrome Prevalence Among 8814 US Adults at Least 20 years old from the National Health and Nutrition Examination Survey III, 1988-1994.^{2,3}

Underlying Causes ^{1,2,4}

- Insulin resistance
- Lifestyle: overweight and/or sedentary
- Genetic: predisposition to insulin resistance

Hallmarks ²

1. Insulin Resistance
2. Central Obesity

Goals of Therapy ^{1,4}

1. Treat Causes
 - Decrease weight: Goal of ≥ 7% decrease if possible
 - Increase physical activity: Goal of ≥ 150 minutes weekly
2. Treat Comorbidities Aggressively
 - Atherogenic Dyslipidemia (cholesterol-lowering agents)
 - Hypertension (HTN) (antihypertensive therapy)
3. Prevent progression into Diabetes and/or related Comorbidities



Aggressive Treatment (continued)

ACE Inhibitor Specific Information

Dosage Forms Available for Physicians Plus Formulary ACE Inhibitors

	2.5mg	5mg	10mg	12.5mg	20mg	25mg	30mg	40mg	50mg	100mg
Benazepril		X	X		X			X		
Enalapril	X	X	X		X					
Lisinopril	X	X	X		X		X	X		
Captopril				X		X			X	X
Lotensin		X	X		X			X		

Formulary ACE Inhibitor Treatment Costs for 30-Day Supply

Tier 1 (low-level copay)	Lisinopril 2.5 to 20 mg/day, \$3.00-\$8.10
Enalapril 2.5 to 40mg/day, \$1.50-\$2.70	Captopril 12.5 to 100 mg/day, \$3.60-\$9.00
Benazepril 5 to 40mg/day, \$4.50 (all strengths)	
Benazepril 5/6.25 to 20/25mg/day, \$6.00 (all strengths)	

Cholesterol

NCEP ATP III Guidelines discuss LDL goals, therapeutic lifestyle changes, and drug therapy. (See NCEP ATP III for specific cholesterol information in JAMA 2002; 285:2486-2497).⁴

Lifestyle Modifications for LDL-Lowering Therapy⁴

- Reduce intake of saturated fat to less than seven percent of total calories and cholesterol intake to less than 200 mg/day.
- Increase LDL lowering with plant stanols/sterols intake of 2 g/day and viscous or soluble fiber of 10 to 25 g/day.
- Weight reduction
- Increased physical activity

Physicians Plus Lipid Reduction Medications on Formulary

- Statins and Statin Combinations
 - Lovastatin, Lovastatin/Niacin (Advicor), Rosuvastatin, Simvastatin, Simvastatin/Ezetimibe (Vytorin) and Atorvastatin (requires PA).
- Fibrates
 - Gemfibrozil, Fenofibrate (micronized; Lofibra only)
- Bile Acid Sequestrant
 - Cholestyramine (cans only), Colestid Granules
- Miscellaneous
 - Niacin OTC, Niaspan, Colestid Granules, Ezetimibe

Statin Specific Information

Dosage Forms Available for Physicians Plus Formulary Statins

	5mg	10mg	20mg	40mg	80mg
Lovastatin		X	X	X	
Rosuvastatin	X	X	X	X	
Simvastatin	X	X	X	X	X
Atorvastatin (PA)		X	X	X	X

Formulary Statin Treatment Costs for 30-Day Supply

Tier 1 (low-level copay)	Tier 2 (high-level copay)
Lovastatin 10 to 40mg/day, \$12.60-\$28.50	Rosuvastatin 5 to 40mg/day, \$88.20 (all strengths)
	Simvastatin 5 to 80mg/day, \$61.42-\$143.61
	Simvastatin/Ezetimibe 10/10mg/day to 80/10mg/day, \$87.68 (all strengths)
	Atorvastatin 10 to 80mg/day, \$77.52-\$112.48 (requires PA)

* Price Bases: Average Wholesale Price, January 2005 or Maximum Allowable Cost, January 2005.

Reminder about Physicians Plus Cost Savings Measures

- Tablet-Splitting program (One free tablet splitter available for provider or member at www.pplusic.com/members/formulary.htm.)

Criteria for Metabolic Syndrome Diagnosis

- Criteria are according to the National Cholesterol Education Program (NCEP) through the Adult Treatment Panel III (ATP III)⁴

NCEP ATP III Criteria for Metabolic Syndrome (Three or more of the following are present)	
Risk Factor	Defining Level
Abdominal Obesity* (Waist Circumference) †	
Men	>40 in (>102 cm)
Women	>35 in (>88 cm)
HDL Cholesterol	
Men	>40 mg/dL
Women	>35 mg/dL
Triglycerides	>150mg/dL
Fasting glucose	>110mg/dL
Blood pressure	>130/ 85 mm Hg

*Overweight and obesity are associated with insulin resistance and the metabolic syndrome. However, the presence of abdominal obesity is more highly correlated with the metabolic risk factors than is an elevated body mass index (BMI). Therefore, the simple measure of waist circumference is recommended to identify the body weight component of the metabolic syndrome. †Some male patients can develop multiple metabolic risk factors when the waist circumference is only marginally increased, eg, 94-102 cm (37-40 in). Such patients may have strong genetic contribution to insulin resistance and they should benefit from changes in life habits, similarly to men with categorical increases in waist circumference.

Quick Tips

Performing a waist circumference measurement¹

- Use a tape measure placed parallel to the floor, at the level of the superior iliac crest, at the end of a relaxed expiration.
- Body mass index (BMI) is NOT one of the criteria for metabolic syndrome, but a BMI>25 increases the likelihood that metabolic syndrome is present.

Educate Patients on Risks of Increased BMI¹

- Posters in waiting area or evaluation room about relationship between height, weight, and BMI
- Health and Nutrition Education Brochures

Encourage Lifestyle Modifications^{1,5}

- The Diabetes Prevention Program (DPP) compared lifestyle modification, metformin, and placebo. After an average follow up of 2.8 years, the absolute incidence of diabetes in the lifestyle group was 4.8%, in the metformin group was 7.8%, and in the placebo group was 11%.⁵ This demonstrated that lifestyle modification reduced the incidence of diabetes more than other options.
- Goal lifestyle modifications of at least seven percent weight loss and at least 150 minutes of physical activity per week reduce the risk of developing diabetes.

References

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