

Primary Prevention Strategies for Stroke

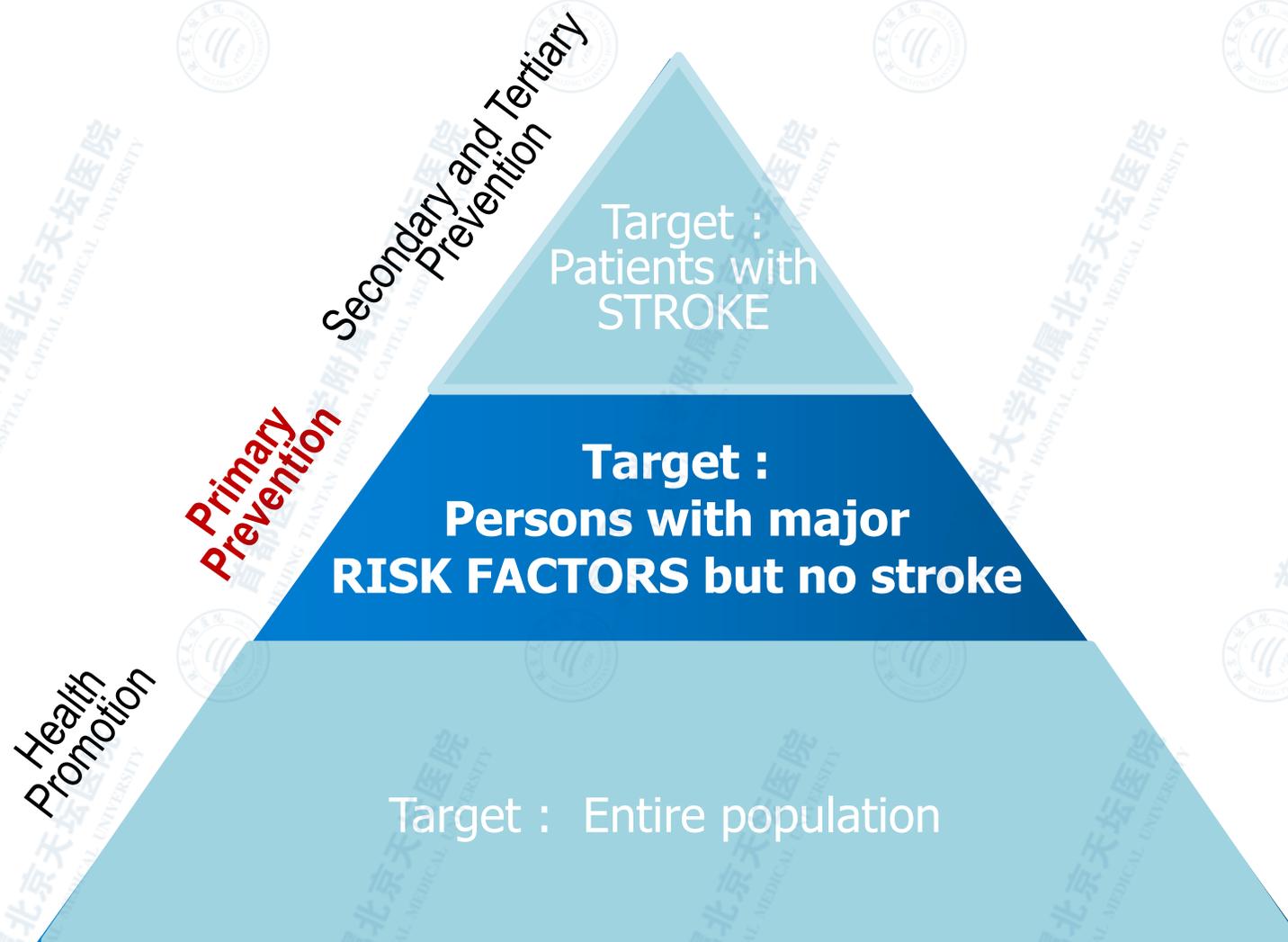


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Prevention Levels to Control Stroke



Classification of risk factors

Hypertension
Diabetes mellitus
Obesity
Dyslipidemia
Atrial Fibrillation
others

Diseases can be controlled, treated and Improved

Socioeconomic Factors

lower incomes
Inadequate medical care
Culture of different areas
others

risk factors that NOT within control

Lifestyles

Smoking
Diet
Physical inactivity
others

Age
Family History
Race
Gender
others

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Hypertension

Hypertension is the leading cause of stroke and the most significant controllable risk factor.

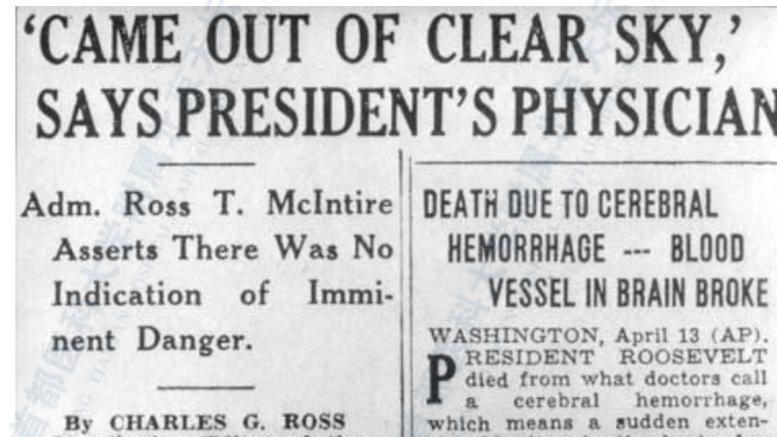
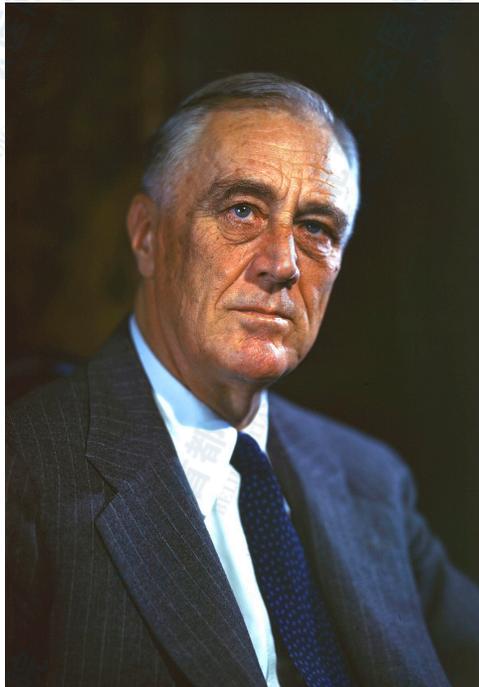


Figure 1. Headlines of the *St. Louis Post-Dispatch*, April 13, 1945.

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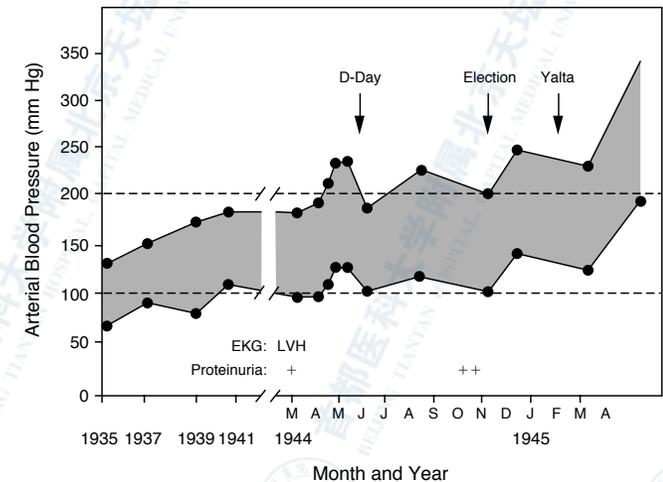
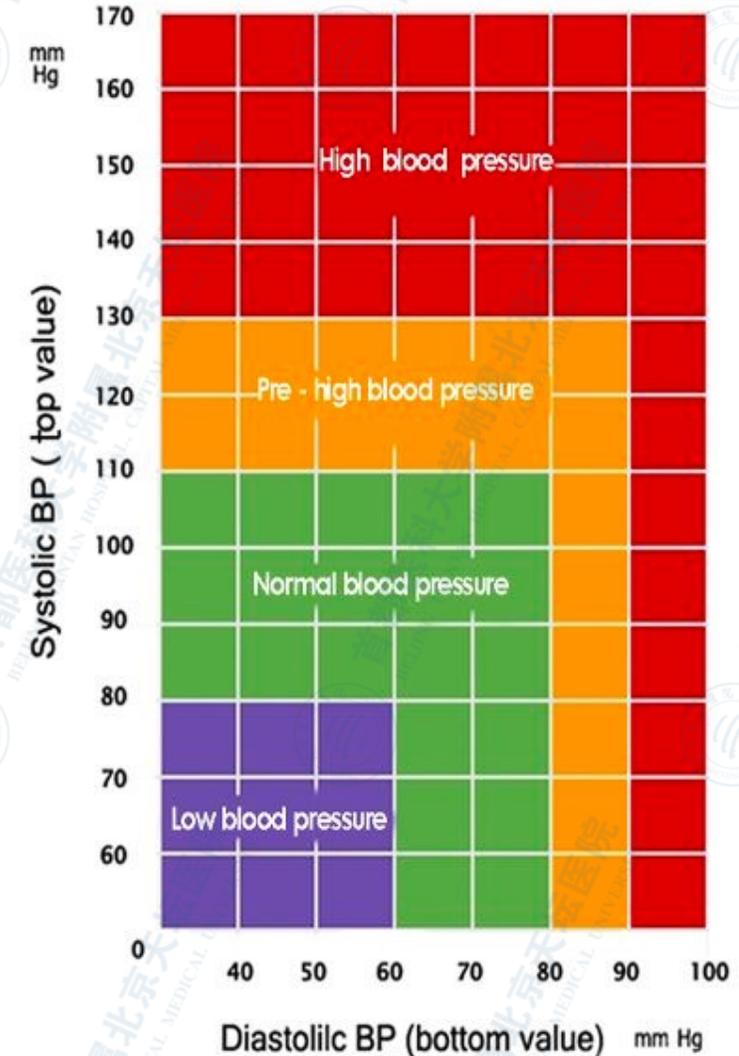


Figure 2. Diastolic and Systolic Arterial Pressure of Franklin D. Roosevelt from 1935 until His Death on April 12, 1945. EKG denotes electrocardiogram, and LVH left ventricular hypertrophy. Data are from the diary of Dr. Howard G. Bruenn.²

Roosevelt, the President of the USA, died of hypertensive intracerebral hemorrhage (April 12, 1945)

STRATEGIES

1. For all the people, best protection is knowledge, management and prevention
 - tell people to check and know their blood pressure numbers at home
 - let people understand the symptoms and risks of hypertension
 - let people learn what factors could make them more likely to develop high blood pressure and put them at risk for serious medical problems.
 - tell people with hypertension steps to reduce their risks and manage their blood pressure.
2. For patients with hypertension, antihypertensive medication need to be prescribed
 - the aim is to keep the blood pressure in the normal range.



recommended by the American Heart Association

Diabetes mellitus

Diabetes mellitus is an independent risk factor for stroke. Many people with diabetes also have high blood pressure, high blood cholesterol and are overweight — increasing their risk even more. While diabetes is treatable, the presence of the disease still increases the risk of stroke.

recommended by the American Diabetes Association

Tests			Diagnosis
Blood Glucose Range	Oral Glucose Tolerance Test	HbA1C	
100 to 125 mg/dL	140 to 199 mg/dL	5.7% to 6.4%	Prediabetes (impaired fasting glucose)
≥ 126 mg/dL	≥ 200 mg/dL	≥ 6.5%	Diabetes mellitus

STRATEGIES

1. monitoring

people should be tested if :

- Over age 45
- Overweight, younger than 45 and have one or more additional risk factors, such as:
 - High blood pressure
 - High cholesterol
 - A family history of diabetes
 - Have a history of gestational diabetes or delivering a baby more than nine pounds

people with normal blood glucose levels should be tested about every three years.

people with prediabetes should be checked for diabetes every one to two years after that diagnosis.

2. lifestyle changes: Lifestyle changes such as losing weight, eating healthy and engaging in regular, moderate physical activity

3. Insulin or hypoglycemic medications to control blood glucose levels

Obesity

Excess body weight and obesity are linked with an increased risk of high blood pressure, diabetes, heart disease and stroke. Losing as little as 5 to 10 pounds can make a significant difference in risks.

body mass index (BMI, kg/m^2) is used as a screening tool to identify whether an adult is at a healthy weight

BMI values (kg/m^2)	
≤ 18.5	underweight.
$18.5 \sim 24.9$	healthy
$25.0 \sim 30.0$	Overweight
≥ 30.0	Obesity
$\geq 40 \text{ kg}/\text{m}^2$	Extreme obesity

STRATEGIES

1. diet

2. physical activity

3. surgery for special cases



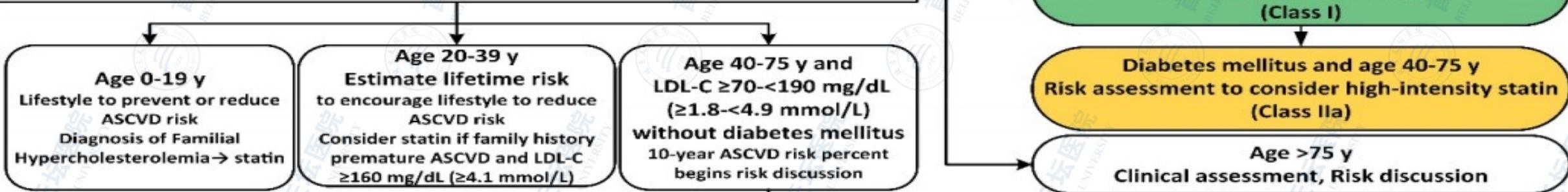
Dyslipidemia

Large amounts of cholesterol in the blood can build up and cause blood clots — leading to a stroke. Also, it appears that low HDL cholesterol is a risk factor for stroke.

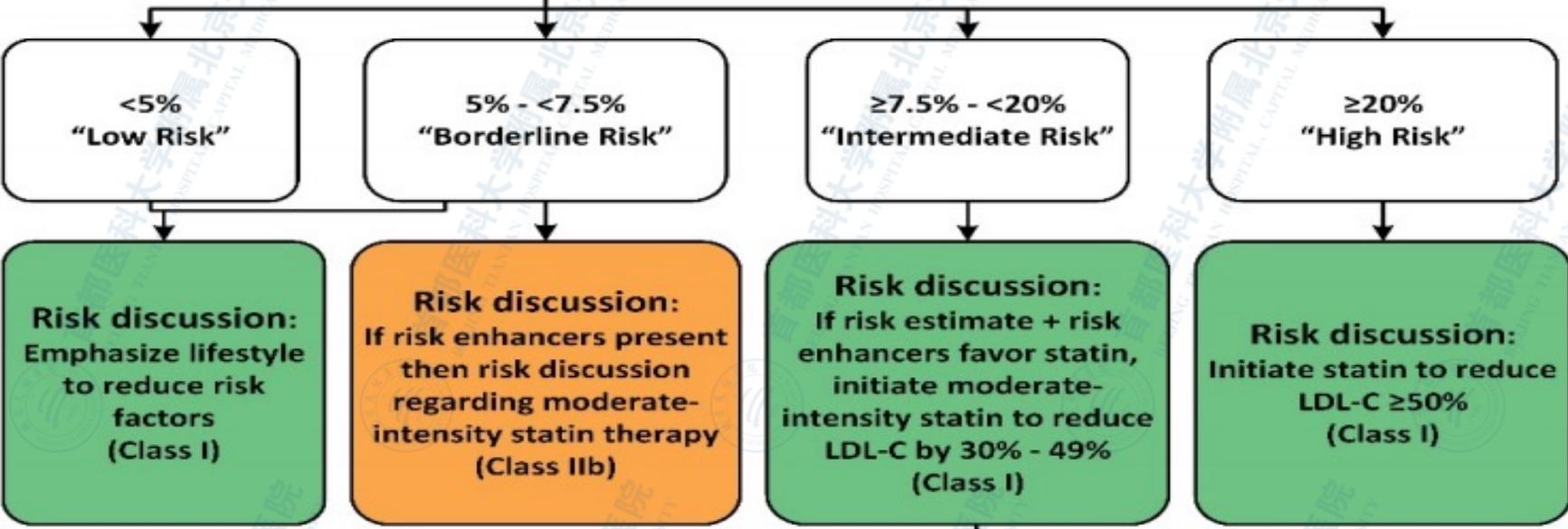
STRATEGIES

1. healthy lifestyles
2. medication: statins

**Primary Prevention:
Assess ASCVD Risk in Each Age Group
Emphasize Adherence to Healthy Lifestyle**



- ASCVD Risk Enhancers:**
- Family history of premature ASCVD
 - Persistently elevated LDL-C ≥ 160 mg/dL (≥ 4.1 mmol/L)
 - Chronic kidney disease
 - Metabolic syndrome
 - Conditions specific to women (e.g., preeclampsia, premature menopause)
 - Inflammatory diseases (especially rheumatoid arthritis, psoriasis, HIV)
 - Ethnicity (e.g., South Asian ancestry)
- Lipid/Biomarkers:**
- Persistently elevated triglycerides (≥ 175 mg/dL, (≥ 2.0 mmol/L))
- In selected individuals if measured:**
- hs-CRP ≥ 2.0 mg/L
 - Lp(a) levels > 50 mg/dL or > 125 nmol/L
 - apoB ≥ 130 mg/dL
 - Ankle-brachial index (ABI) < 0.9



**If risk decision is uncertain:
Consider measuring CAC in selected adults:**

CAC = zero (lowers risk; consider no statin, unless diabetes, family history of premature CHD, or cigarette smoking are present)

CAC = 1-99 favors statin (especially after age 55)

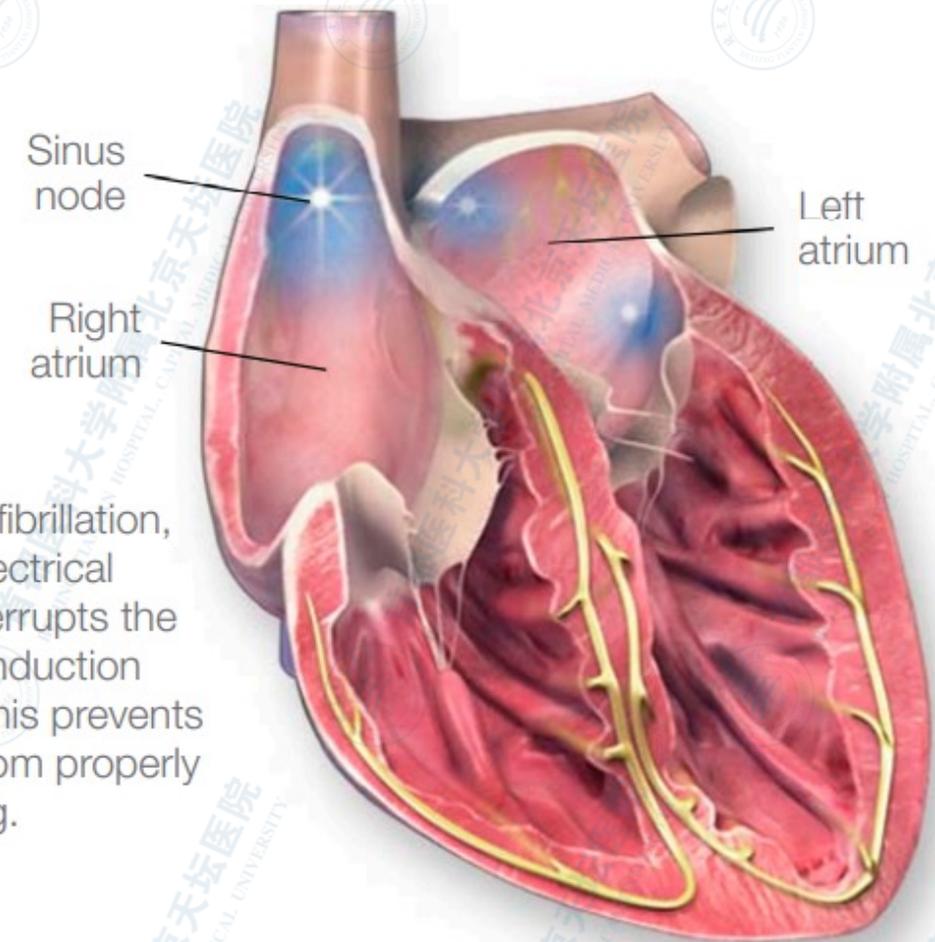
CAC = 100+ and/or ≥ 75 th percentile, initiate statin therapy

Atrial Fibrillation

Atrial fibrillation can travel to the brain and cause a stroke.

Untreated atrial fibrillation is associated with a 5-fold increased risk for stroke.

With atrial fibrillation, random electrical activity interrupts the normal conduction rhythm. This prevents the atria from properly contracting.



STRATEGIES

1. monitoring the heart rhythm
2. Anticoagulants
 - warfarin
 - NOACs (novel oral anticoagulants)
 - dabigatran
 - rivoraxaban
 - apixaban

Smoking

The nicotine and carbon monoxide in cigarette smoke damage the cerebrovascular system and pave the way for a stroke. The use of birth control pills combined with cigarette smoking can greatly increase the risk of stroke.

There are more than 5,000 chemical components found in cigarette smoke and hundreds of them are harmful to human health, according to the American Centers for Disease Control and Prevention, such as:

- nicotine
- carbon monoxide
- 1,3-Butadiene
- Benzene
- Cadmium
- Chromium VI
- Formaldehyde
- Polonium-210
- Tar



STRATIGIES

1. quit smoking at once
2. medication

Diet

Diets high in saturated fat, trans fat and cholesterol can raise blood cholesterol levels. Those high in sodium can increase blood pressure. And those with high calories can lead to obesity. But a diet containing five or more servings of fruits and vegetables per day may reduce the risk of stroke.

Stratigies

A diet containing five or more servings of fruits and vegetables per day may reduce the risk of stroke.



VEGETABLES

CANNED, DRIED, FRESH & FROZEN

5 SERVINGS or 2.5 CUPS



FRUITS

CANNED, DRIED, FRESH & FROZEN

4 SERVINGS or 2 CUPS



WHOLE GRAINS

BARLEY, BROWN RICE, MILLET, OATMEAL, POPCORN AND WHOLE WHEAT BREAD, CRACKERS & PASTA

3-6 SERVINGS or 3-6 OUNCES



DAIRY

LOW FAT (1%) AND FAT-FREE

3 SERVINGS or 3 CUPS



PROTEINS

EGGS, NON-FRIED FISH, LEAN MEAT, LEGUMES, NUTS, SKINLESS POULTRY & SEEDS

1-2 SERVINGS or 5.5 OUNCES



OILS

POLYUNSATURATED AND MONOUNSATURATED CANOLA, OLIVE, PEANUT, SAFFLOWER & SESAME OIL

3 TBSP

Food should give you energy – not weigh you down!
With a few simple changes, you can make eating healthy your easiest habit.

LIMIT

SUGARY DRINKS, SWEETS, FATTY MEATS, AND SALTY OR HIGHLY PROCESSED FOODS

AVOID

PARTIALLY HYDROGENATED OILS, TROPICAL OILS, AND EXCESSIVE CALORIES

REPLACE

HIGHLY PROCESSED FOODS WITH HOMEMADE OR LESS-PROCESSED OPTIONS

ENJOY

A VARIETY OF NUTRITIOUS FOODS FROM ALL OF THE FOOD GROUPS, ESPECIALLY FRUITS & VEGGIES

KEEP

HEALTHY HABITS EVEN WHEN YOU EAT AWAY FROM HOME

Physical Inactivity



Fit in 150+

Get at least 150 minutes per week of moderate-intensity aerobic activity or 75 minutes per week of vigorous aerobic activity (or a combination of both), preferably spread throughout the week.



Move More, Sit Less

Get up and move throughout the day. Any activity is better than none. Even light-intensity activity can offset the serious health risks of being sedentary.



Add Intensity

Moderate to vigorous aerobic exercise is best. Your heart will beat faster, and you'll breathe harder than normal. As you get used to being more active, increase your time and/or intensity to get more benefits.



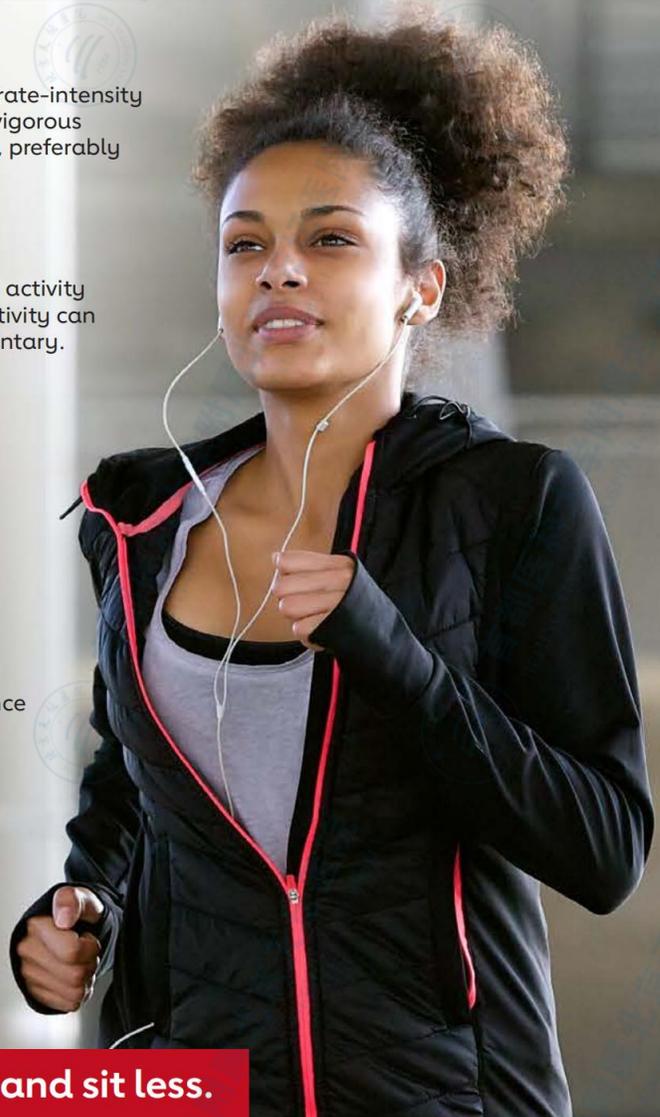
Add Muscle

Include moderate- to high-intensity muscle-strengthening activity (like resistance or weight training) at least twice a week.



Feel Better

Physical activity is one of the best ways to keep your body and brain healthy. It relieves stress, improves mood, gives you energy, helps with sleep and can lower your risk of chronic disease, including dementia and depression.



Physical Inactivity can increase the risk of stroke, heart disease, overweight/obesity, high blood pressure, high blood cholesterol and diabetes.

Stratigies

Move more and sit less, aim for being active at least 150 minutes a week

Move more, with more intensity, and sit less.

Summary

In summary, the strategies for stroke primary prevention:

physical examination

- blood pressure
- blood glucose
- blood lipids
- BMI
- heart rhythm

healthy lifestyles

- quit smoking
- healthy diet
- physical activity

Thank You!



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