

# STROKE PREVENTION: A Strategic Plan

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Woody Allen once said, "I'm not afraid of death and dying. I just don't want to be there when it happens." Stroke, a leading cause of death and dying, as well as disability and expense, can be prevented.<sup>1 2</sup> And we physicians can assist greatly in this effort.

As with many conditions, risk factors for stroke have been identified (Table I). Assessing patients for these risk factors is important, since controlling them can significantly decrease the incidence of stroke and reverse the increasing trend.<sup>3</sup> This is secondary to increasing prevalence and less adequate control of key cerebrovascular risk factors.

**Table I. Stroke Risk Factors**

Risk Factor	Estimated Population-Attributable Risk	Prevention of first stroke proven?
Hypertension	High	Yes
Coronary heart disease	Medium	Yes
Atrial fibrillation	Low	Yes
Diabetes mellitus	Low	No
Blood lipids	Medium	Yes
Smoking	Low	No
Heavy alcohol consumption	Low	No
Asymptomatic carotid artery stenosis	Low-medium	Yes

Preventing people from having a first stroke will require a comprehensive, multidisciplinary strategy to identify and manage major risk

factors and to promote adherence to preventive protocols.<sup>4</sup> This *Heartbeat* summarizes the consensus statement from the National Stroke Association (NSA).<sup>5</sup>

Direct stroke reduction is proven for:

- 1) **Hypertension Treatment:** The most prevalent and modifiable risk factor.
  - A decrease in diastolic BP of 5-6 mm Hg reduces the risk of stroke by 42%.<sup>6</sup>
  - Treatment of isolated systole hypertension decreases the risk of stroke by 36%.<sup>7</sup>
  - Use of JNC VI guidelines are strongly recommended.<sup>8</sup>
  
- 1) **Warfarin Treatment:** For patients post-MI who have
  - atrial fibrillation.
  - decreased LV ejection fraction
  - LV thrombus<sup>9 10 11 12</sup>
 (An INR range of 2.0 to 3.0 with a target goal of 2.5 is recommended.)  
 Although aspirin is recommended for prevention of recurrent MI, it has shown little absolute risk reduction for strokes.
  
- 3) **Statin Treatment:** For **all** patients post MI.<sup>13 14 15</sup> The goals for cholesterol and LDL are <200 and 100 respectively. Treatment should be strongly considered for patients with CVA, TIA, or any other proven vascular disease and diabetics. For all other patients follow the National Cholesterol Education Program guidelines.<sup>16</sup>

The antistroke effects of the statin agents may come not from their lowering of lipids, but from non-lipid mechanisms that modify endothelial function, inflammatory responses, plaque stability and thrombus formation.<sup>17</sup>

**4) Warfarin Treatment:** For patients with atrial fibrillation and specific risk factors:<sup>18</sup>

previous TIA or stroke	heart failure
hypertension	diabetes mellitus
valvular heart disease	age

Atrial fibrillation increases the risk of stroke 6 times. More than two million adults in the U.S. have non-valvular atrial fibrillation, and about 36% of strokes in patients between the ages of 80-89 are attributed to this condition.

- Give to all patients over 75, with or without risk factors (assuming no major contraindications). Treating these older patients is always difficult because their risk of bleeding is higher, but stroke risk increases proportionately with age. The benefit significantly outweighs the risk.
- For patients over 65 without risk factors, the NSA suggests either warfarin or ASA. Warfarin is the optimal treatment for patients over 65 but the benefit to risk ratio is minimal.<sup>19</sup>
- Give to all patients with risk factors.
- For patients with no risk factors and under age 65—use ASA, 325 mg/day.

**5) Carotid Endarterectomy (CEA):** For asymptomatic patients with stenosis of > 60% but <100% when surgical morbidity and mortality is <3%.<sup>20 21</sup> Clinical symptoms and events increase with the degree of stenosis.

Stroke prevention treatments not proven but strongly recommended:

**1) Diabetes Control:** Follow the American Diabetes Association recommendations<sup>22</sup> for control of diabetes to reduce microvascular complications (retinopathy, nephropathy, and neuropathy).<sup>23</sup> (Further studies are needed to determine if aggressive glycemic control lowers the risk of stroke).

**2) Lifestyle-related risk factors:** Observational studies support modifying risk factors such as smoking, alcohol use, sedentary physical activity level and poor diet. Measures to help patients improve their compliance is an important component of a stroke prevention plan.

Obviously we cannot fulfill Woody's wish, but we can improve quality and delay the inevitable by applying and tailoring these recommendations to our individual patients.

Mario L. Maiese, D.O., F.A.C.C.

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<sup>1</sup> *Stroke* 1998; 29: 415-21.  
<sup>2</sup> National Stroke Assoc. *Stroke/Brain Attack Briefing*. Postgraduate Institute for Medicine; 1996: 1-34.  
<sup>3</sup> *National Heart, Lung and Blood Institute. Fact Book Fiscal Year 1996*, Bethesda, Md: U.S. Dept. of Health and Human Services. Nat. Institute of Health; 1997  
<sup>4</sup> *Circulation* 1997; 1995: 1085-90.  
<sup>5</sup> *JAMA* March 24/31, 1999; 281:1112-20. Consensus Statement from the National Stroke Association. Prevention of First Stroke.  
<sup>6</sup> *Lancet* 1990; 335:827-38.  
<sup>7</sup> *JAMA* 1991; 265: 3255-64.  
<sup>8</sup> *Arch Intern Med* 1997; 157:2413-46.  
<sup>9</sup> *N Engl J Med* 1997; 336: 251-57.  
<sup>10</sup> *Chest* 1998; 114: 611-33.  
<sup>11</sup> *Chest* 1998; 114: 683-98.  
<sup>12</sup> *J Am Coll Cardiol* 1996; 28: 1328-1428.  
<sup>13</sup> *N Engl J Med* 1996; 335: 1001-09.  
<sup>14</sup> *Lancet* 1994; 344: 1383-89.  
<sup>15</sup> *Am J Cardiol* 1995; 76:474-79.  
<sup>16</sup> *JAMA* 1993; 269: 3015-23(NCEP)  
<sup>17</sup> *JAMA* 1998; 279: 1643-50.  
<sup>18</sup> *Am J Cardiol* 1998; 81: 35C-40C.  
<sup>19</sup> *JAMA* May 19, 1999; 281:1830-53.  
<sup>20</sup> *JAMA* 1995; 273: 1421-28.  
<sup>21</sup> *Circulation* 1998; 97:501-09.

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<sup>22</sup> *Diabetes Care* 1998; 21 (Suppl I): S1-S89.

<sup>23</sup> *N Engl J Med* 1993; 329: 977-86.