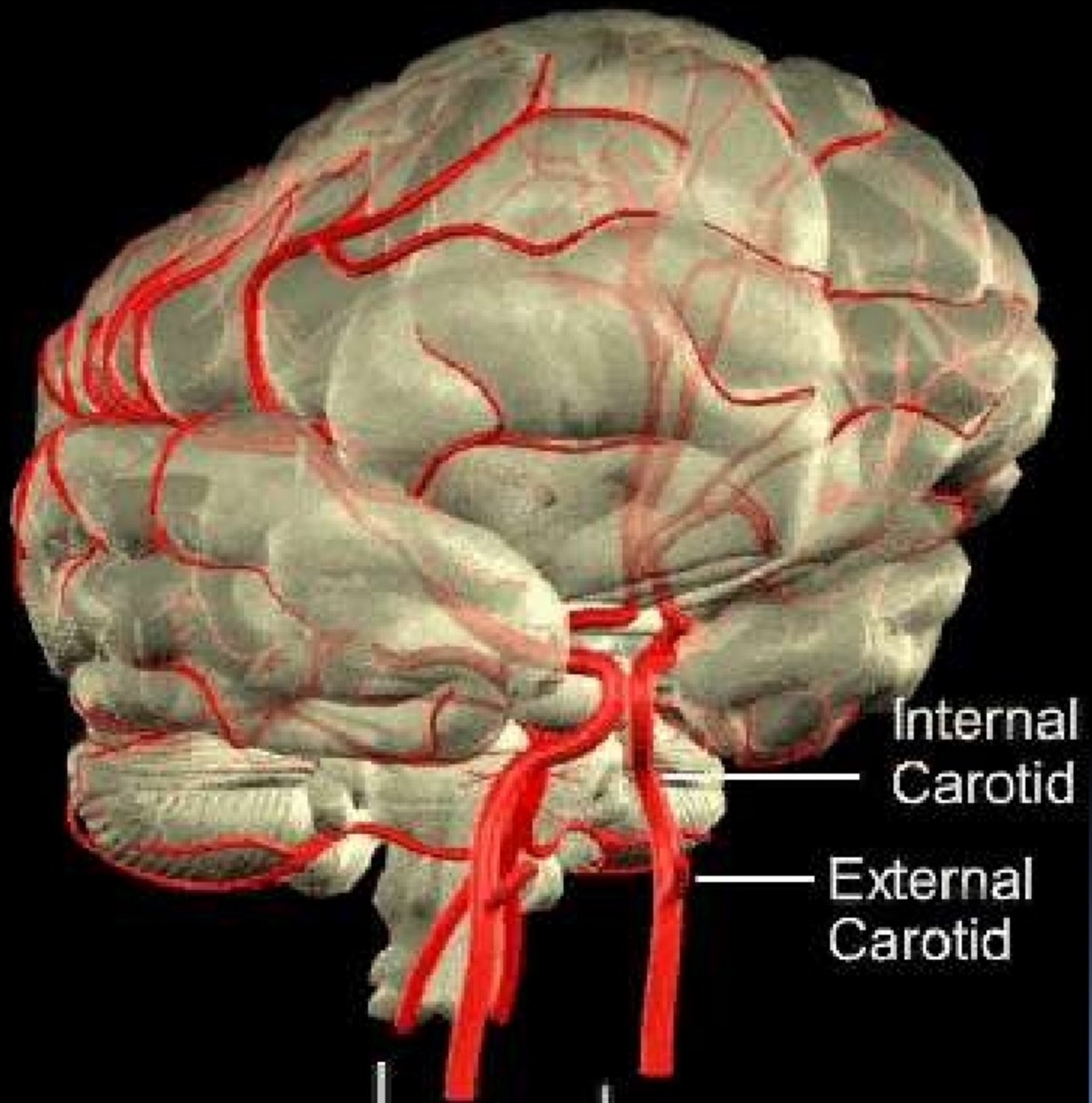


STROKE

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Neurology



LEARNING OBJECTIVES

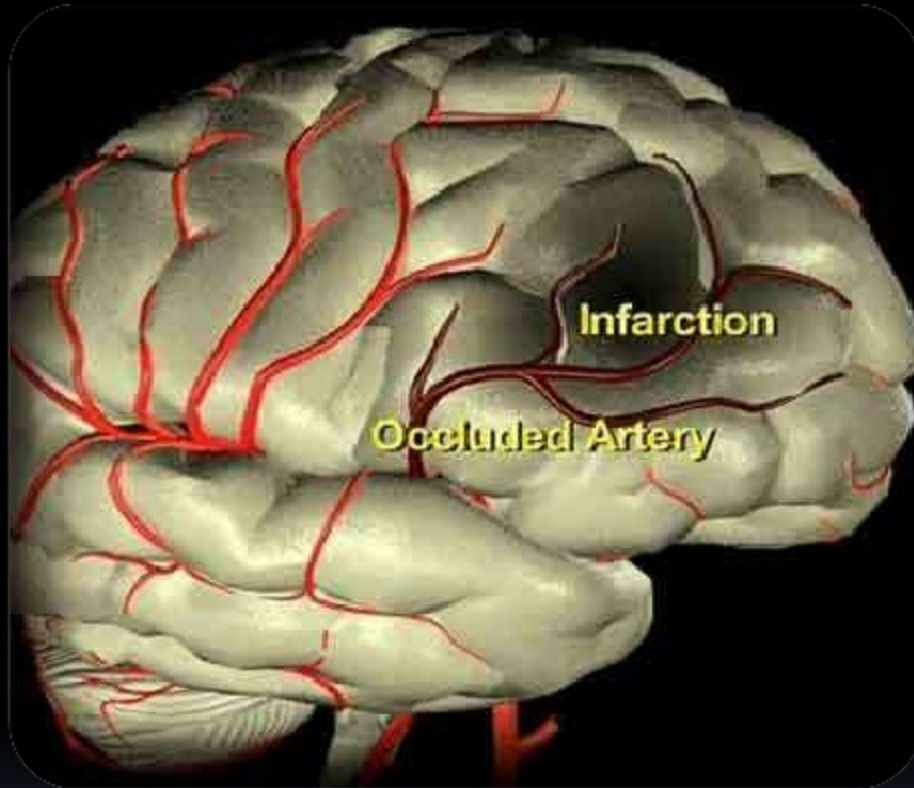
- To be able to define stroke, discuss its pathophysiology and risk factors
- To emphasize early evaluation and management of stroke patients
- To discuss the latest stroke treatment strategies
- **CASE STUDIES:** To be able to analyze clinical situations, localize the stroke lesion, determine probable etiology





"THE BRAIN IS A VERY UNIQUE, HIGH-MAINTENANCE END- ORGAN. IT IS VERY DEPENDENT ON *MOMENT-TO-MOMENT* SUPPLY OF GLUCOSE AND OXYGEN TO SUSTAIN ITS HIGH-POWERED ACTIVITIES. IT IS VERY SENSITIVE TO THE SYSTEMIC STATE. ANY SEVERE MEDICAL INSULT, THEREBY, HAS TREMENDOUS IMPACT ON THE BRAIN METABOLISM. ANY MEDICAL EMERGENCY IS A NEUROLOGIC EMERGENCY!"

A. Valencia, M.D.

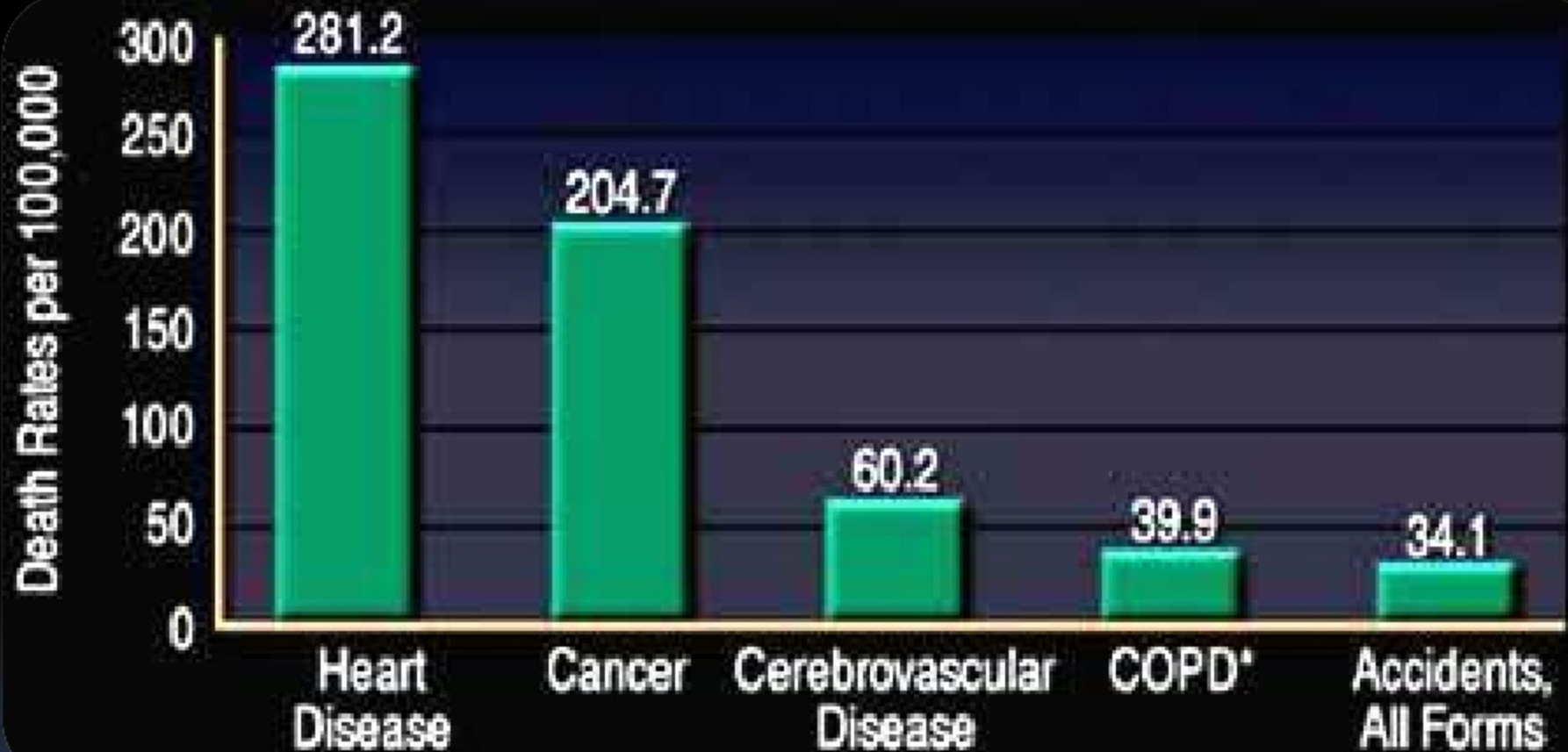


The biology of stroke is such that each moment of ischemia and tissue injury increases the degree of irreversible tissue damage.

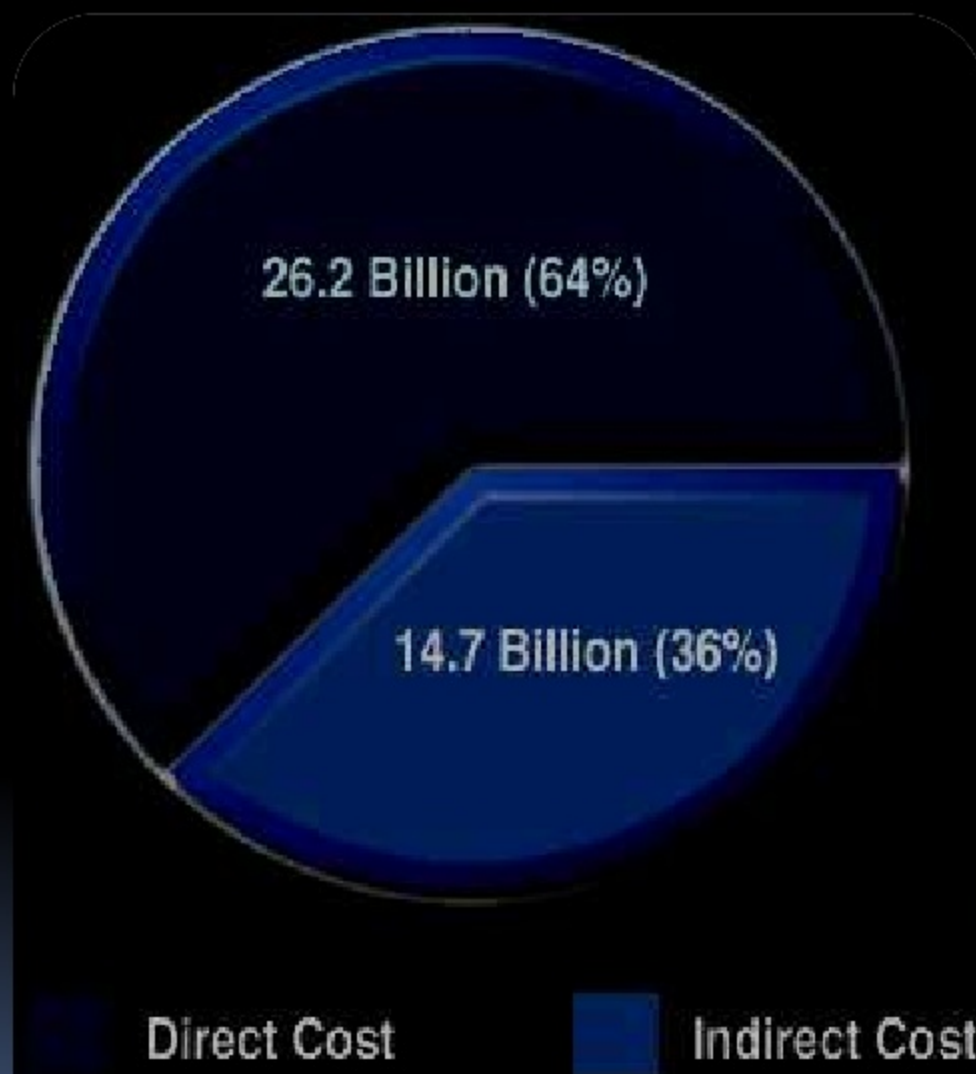
CEREBROVASCULAR ACCIDENT OR “BRAIN ATTACK”

- Third leading cause of death
- 750, 000 cases/year
- Leading cause of significant disability
- Cost: \$40 billion/year

Major Causes of Death in the United States, 1995

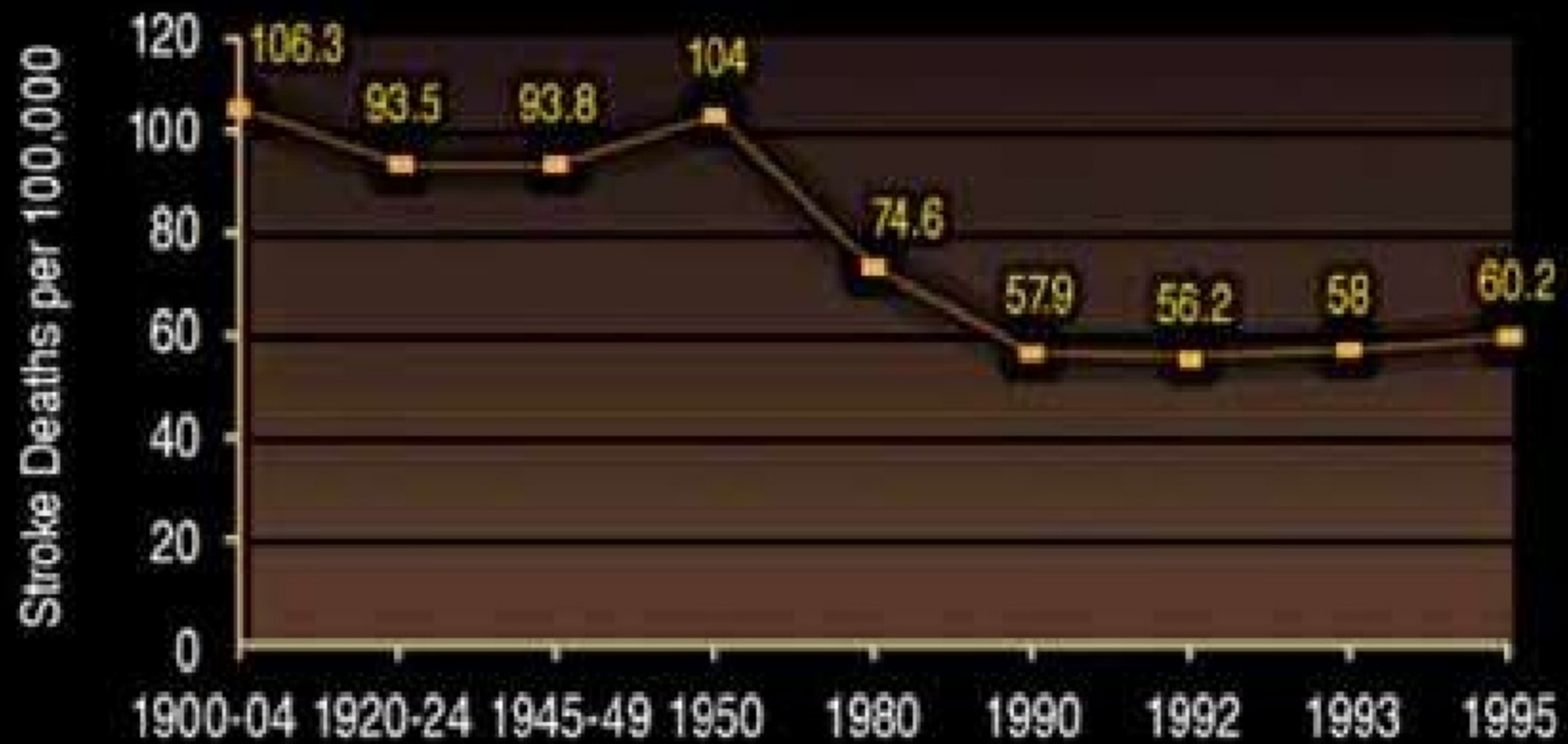


Annual Economic Costs of Stroke (All Types) In The US

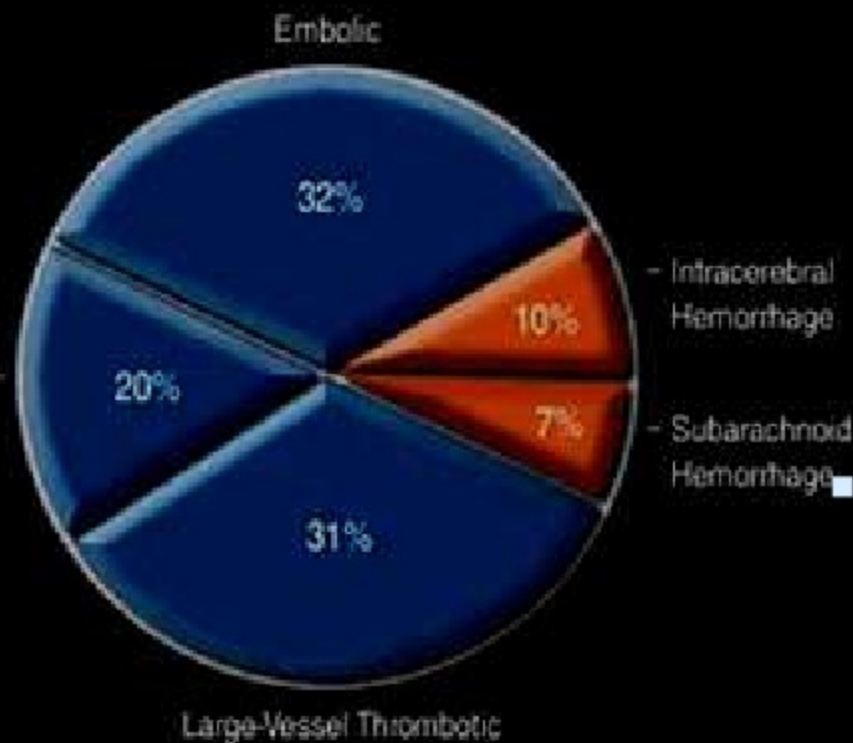


Source: Adapted from American Heart Association,
1997 Heart and Stroke Statistical Update.

Death Rates for Stroke per 100,000 Population



Types of Stroke



- **Ischemic, 80%**

- thrombosis, 50% (small & large-vessel)
- embolism, 30% [now believed significantly higher]

- **Hemorrhagic, 20%**

- intracerebral (HTN as risk)
- subarachnoid (aneurysm)

Stroke vs. TIA

- **Transient ischemic attack (TIA):** A clinical syndrome characterized by an acute loss of focal brain or monocular function with symptoms lasting less than 24 hrs and which is thought to be due to inadequate cerebral or ocular blood supply, *without ischemic changes in Diffusion Weighted Imaging (DWI)*
- **Stroke:** Clinical syndrome characterized by an acute loss of focal brain or monocular function with symptoms lasting greater than 24 hrs and which is thought to be due to inadequate cerebral or ocular blood supply.

Risk Factors for Stroke That Cannot Be Changed

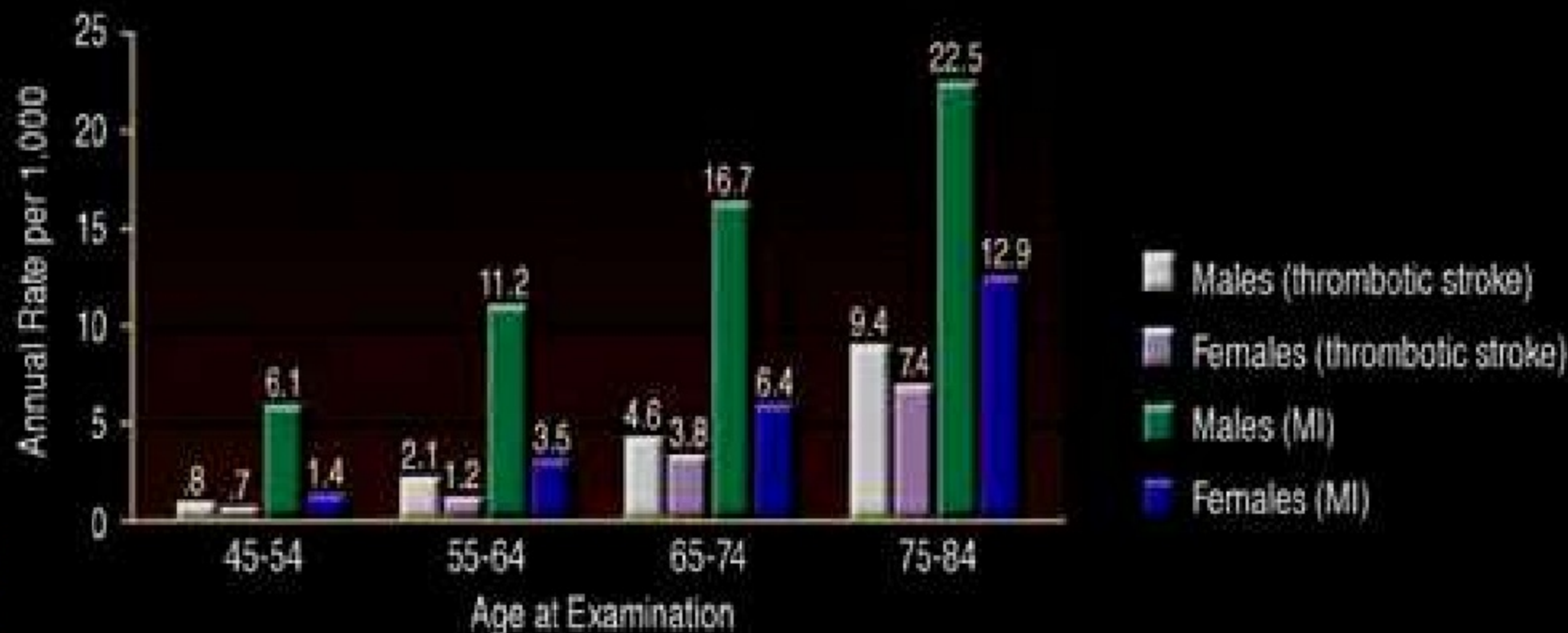
- Increased age
- Being male
- Race (e.g., African-Americans)
- Diabetes mellitus
- Prior stroke/transient ischemic attacks
- Family history of stroke
- Asymptomatic carotid bruit

Time Post-TIA	Risk of Stroke (%)
1 Month	4 - 8
1 Year	12 - 13
5 Years	24 - 29

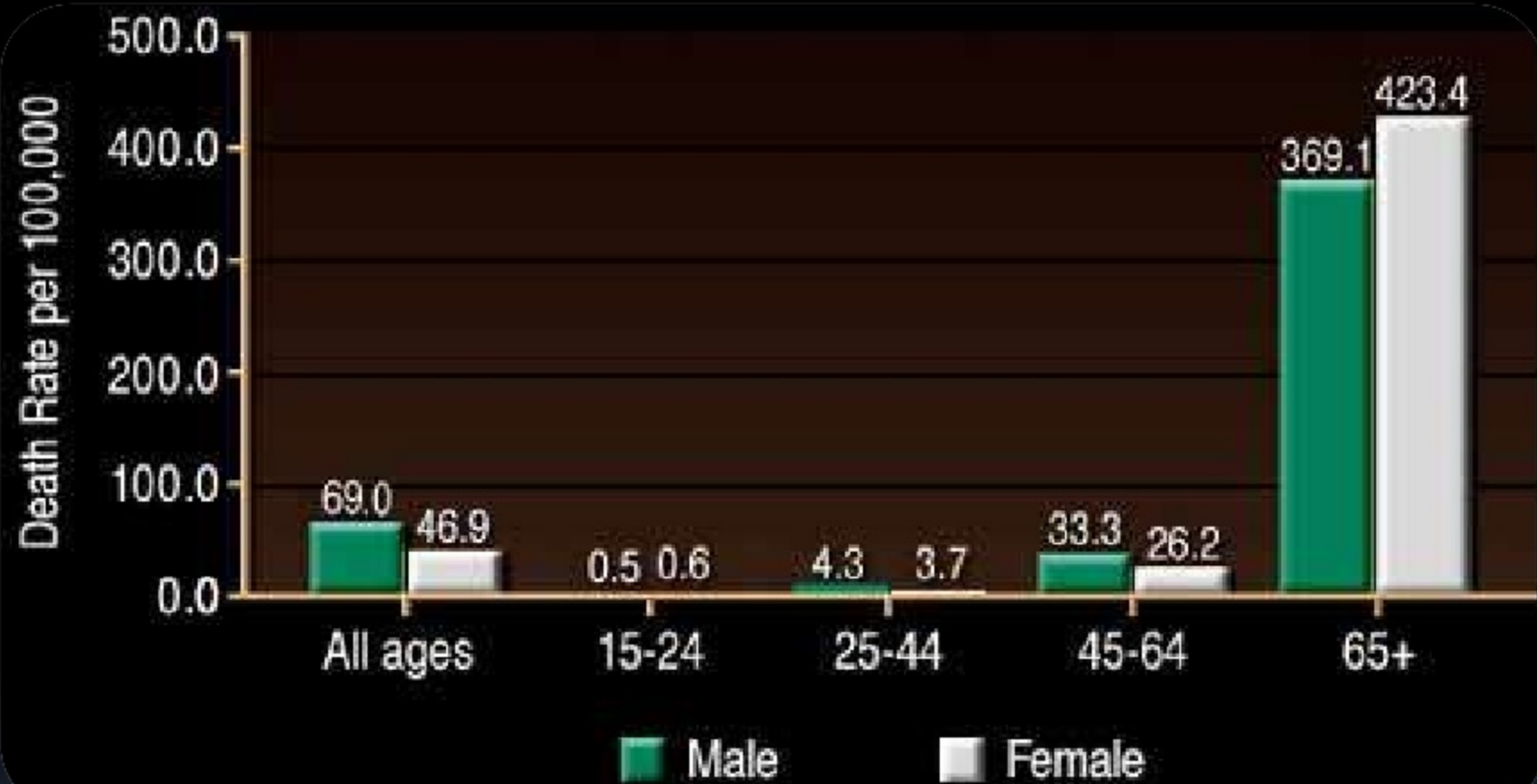
Source: Adapted from Feinberg WM, et al. *Stroke*. 1994;25:1320.

Up to approximately 30% of people who suffer transient attacks (TIAs) will develop a stroke within 5 years.

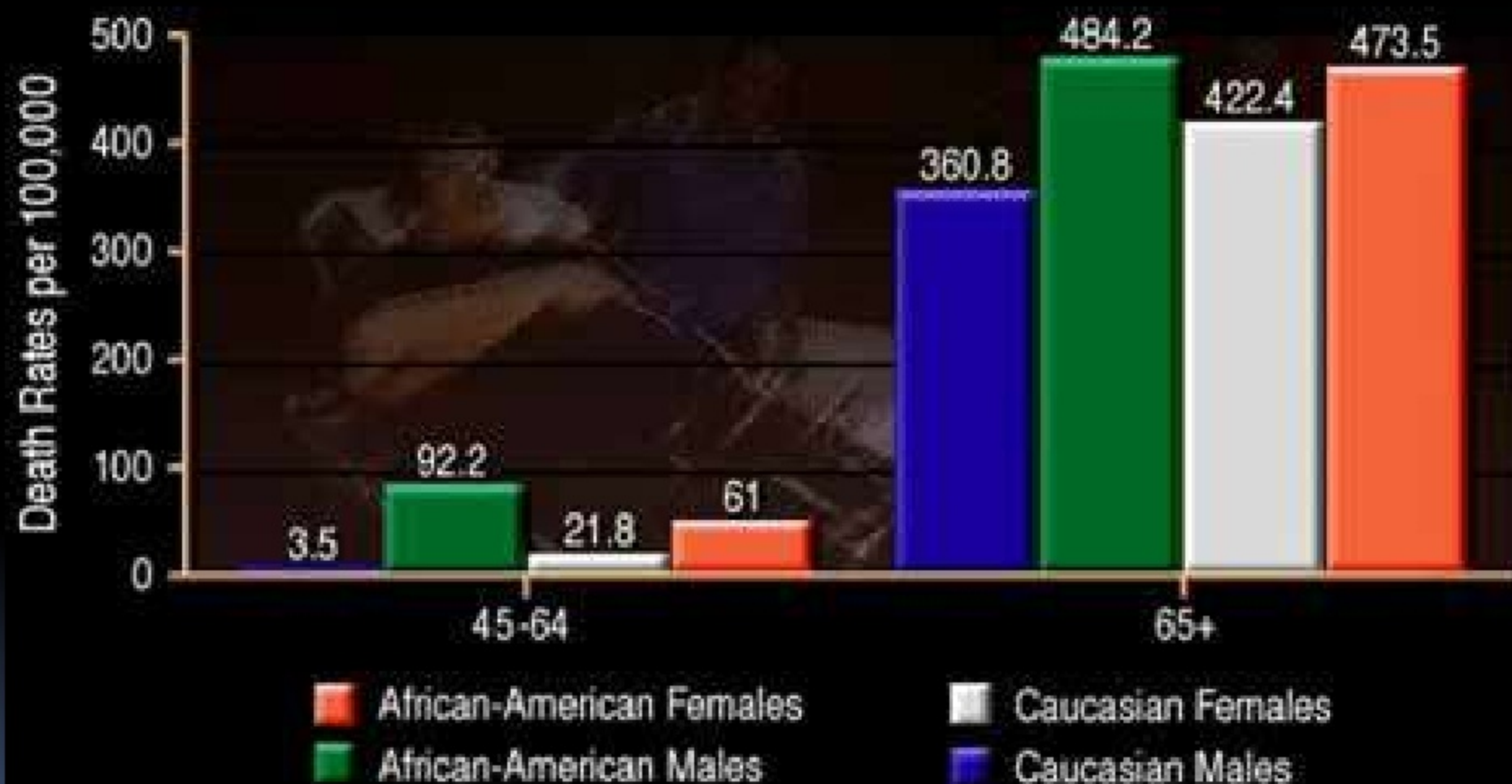
Relative Incidence of Atherothrombotic Stroke and MI by Age and Gender



Source: Adapted from Wolf PA, et al. Epidemiology of stroke. In: Barnett HJM, et al (eds). *Stroke. Pathophysiology, Diagnosis and Management*. New York, Churchill-Livingstone, 1992.



Death Rates for Stroke per 100,000 Population Groups Defined by Race, Age, and Gender: 1993



Risk Factor For Stroke: Treatable

Major

- Hypertension
- Heart disease, esp. atrial fibrillation
- Cigarette smoking
- Transient ischemic attacks
- Dyslipidemia
- Physical inactivity
- Obesity

Less Well Documented

- Excessive alcohol intake / drug abuse
- Acute infection*

Alcohol Consumption as a Risk Factor for Stroke

- Heavy alcohol consumption may increase risk of stroke by a number of mechanisms.
- The reported effects of alcohol consumption on risk of ischemic stroke have been inconsistent.
- A differential effect of alcohol consumption on stroke risk in men compared to women has been observed.

Alcohol Consumption as a Risk Factor for Stroke

- Light and moderate alcohol use tend to raise levels of high-density-lipoprotein (HDL) -- the "good" lipoprotein.
- Heavy drinking or binge drinking, is related to an increased incidence of stroke as a cause of death
Light or moderate alcohol consumption, is related to a reduced risk of coronary heart disease.
- There is positive, dose-related effect of alcohol consumption on risk of intracranial hemorrhage, both arachnoid and intracerebral .

Less Well Documented

- Geography/climate
- Socioeconomic factors

