EVIDENCE-STATEMENT:

# ASPIRIN THERAPY FOR THE PRIMARY PREVENTION OF CARDIOVASCULAR DISEASE (Counseling)

**Why This Chapter is Important for Employers: An Overview**

- Heart disease is the leading cause of death in the United States.[1]
- Each year, over 1 million Americans experience new or recurrent myocardial infarction (heart attack) or fatal coronary heart disease (CHD). Most events occur in older people and those with recognized risk factors for cardiovascular disease, including high blood cholesterol levels, hypertension, diabetes, or a history of smoking.[2]
- Coronary heart disease (CHD), which is the most common type of heart disease in the United States, is a leading cause of death and disability in the working population.
- Heart disease and stroke are expected to cost more than $403 billion in 2006.[3]
- Aspirin therapy may decrease the risk of CHD in adults who are at increased risk for heart disease, although aspirin is contraindicated for some individuals.[2]
- Adults who are at increased risk for heart disease may wish to consider aspirin therapy, but only after consultation with their medical providers.[2]
- Aspirin, when used as a preventive medication by men at average risk for cardiovascular events (men whose 10-year risk of CHD is 7.5% or higher), is both cost-saving and life-saving. A recent study found that average risk men who took therapeutic aspirin gained 15 quality-adjusted days of life at a cost that was $215 less than no therapy at all.[4]

## Clinical Preventive Service Recommendations

**U.S. Preventive Services Task Force Recommendation**

The U.S. Preventive Services Task Force (USPSTF) strongly recommends that clinicians discuss aspirin chemoprevention with adults who are at increased risk for coronary heart disease (CHD). Discussions with patients should address both the potential benefits and harms of aspirin therapy.[2]

***Evidence Rating:*** **A (Strongly Recommended/ Good Evidence)**

The USPSTF found good evidence that aspirin decreases the incidence of coronary heart disease in adults who are at increased risk for heart disease. They also found good evidence that aspirin increases the incidence of gastrointestinal bleeding and fair evidence that aspirin increases the incidence of hemorrhagic strokes. The USPSTF concluded that the balance of benefits and harms is most favorable in patients at high risk of CHD (5-year risk of greater than or equal to 3%) but is also influenced by patient preferences.[2]

**Other Recommended Guidance American Diabetes Association (ADA)**

The American Diabetes Association (ADA) recommends that physicians consider aspirin therapy in diabetic patients between that ages of 30 and 40 years, particularly when there is the presence of other cardiovascular risk factors.[5]

***Evidence Rating:*** **E**

The ADA has designated an “E” rating as a standard of care based on expert opinion.

**American Diabetes Association (ADA)**

The ADA recommends that use of aspirin therapy (75-162mg/day) as a primary prevention strategy in those with either type 2 diabetes (A rating) or type 1 diabetes (B rating) who are over 40 years of age or have additional risk factors (family history of CVD, hypertension, smoking, dyslipidemia, or albuminuria.).[5]

***Evidence Rating:* A/B**

An "A" rating is based upon clear evidence from randomized control trials.
A "B" rating is based upon supportive evidence from well-controlled cohort studies.

**The American Heart Association (AHA)**

The American Heart Association (AHA) recommends aspirin use, if not contraindicated, for patients who have had a myocardial infarction (heart attack), unstable angina, ischemic stroke (caused by blood clot), or transient ischemic attacks (TIAs or "little strokes"). This recommendation is based on sound evidence from clinical trials showing that aspirin helps prevent the recurrence of such events. Studies show aspirin also helps prevent these events from occurring in people at high risk.[6]

The AHA also concluded that aspirin may be warranted for patients at high risk for myocardial infarction but that health care providers must consider a patient's particular cardiovascular risk profile, the demonstrated benefits of aspirin on reducing risk for a first myocardial infarction, and known as well as unknown side effects of aspirin.[7]

***Evidence Rating:***

Evidence from clinical trials.

**Information Sources**

The recommendations and supporting information contained in this document came from several sources, including the:

- American Diabetes Association (ADA)
- American Heart Association (AHA)
- Peer reviewed research
- U.S. Preventive Services Task Force (USPSTF)

The background and supporting information contained in this document is a compilation of research findings. All information presented in this document should be attributed to its referenced source and should not be considered a reflection of other organizations cited in the text.

## Condition/Disease Specific Information

**Epidemiology of Condition/Disease**

Heart disease and stroke are the most common types of cardiovascular disease and are the first and third leading causes of death for both men and women in the United States.[8] In 2002, the age-adjusted death rate was 241 per 100,000 people, equating to almost 700,000 deaths per year.[9]

**Condition/Disease Risk Factors**

Each year, over 1 million Americans experience new or recurrent myocardial infarction (heart attack) or fatal coronary heart disease. Most events occur in older people and those with recognized risk factors for cardiovascular disease. In 2003, approximately 37% of adults reported having at least 2 of 6 risk factors for heart disease and stroke (high blood pressure, high cholesterol, diabetes, current smoking, physical inactivity, and obesity).[10]

Decisions about aspirin therapy should take into account the overall risk for coronary heart disease. Risk assessment should include asking about the presence and severity of the following risk factors: age, sex, diabetes, elevated blood

pressure, family history (in younger adults), smoking,[2] elevated total cholesterol levels, low levels of high density lipoprotein (HDL-C) cholesterol, and high levels of low density lipoprotein (LDL-C) cholesterol.[3]

## Value of Prevention

**Economic Burden of Condition/Disease**

In 2006, cardiovascular disease is expected to cost more than $403 billion, including expenses related to healthcare services, medications, and lost productivity.[3] The total (direct and indirect) cost of coronary heart disease was estimated at $142 billion in 2006.[3]

**Workplace Burden of Condition/Disease**

The workplace burden of heart diseases and stroke in 2006 included $35.6 billion in lost productivity due to morbidity and an additional $109.9 billion dollars in lost future earnings due to premature mortality.[3] Already a leading cause of death and disability in the United States working population, the workplace burden of cardiovascular diseases is expected to grow as a result of the aging workforce.[3]

**Economic Benefit of Preventive Intervention**

The economic benefit of counseling primarily results from the improved quality of life and the averted cost of illness with successful aspirin therapy. Most trials demonstrate a 15% to 40% reduction in cardiovascular events with chronic aspirin use.[11]

**Estimated Cost of Preventive Intervention**

The annual cost of an aspirin regimen is $18 and ranges from $3 to $55 per year in 2004 dollars.[12]

In 2004, the private-sector cost of prevention counseling averaged $39 per session; approximately 95% of paid claims fell within the range of $0 to $129 per session.[13]

**Estimated Cost of Treatment**

In 2004, the cost of treatment for all conditions with myocardial infarction as the principal diagnosis was $45,076 per discharge.[14]

**Cost-Effectiveness and/or Cost-Benefit Analysis of Preventive Intervention**

Aspirin, when used as a preventive medication by men at average risk for cardiovascular events (men whose 10-year risk of CHD is 7.5% or higher), is both cost-saving and life-saving. A recent study found that average risk men who took therapeutic aspirin gained 15 quality-adjusted days of life at a cost that was $215 less than no therapy at all.[4]

According to one study, increasing the use of aspirin therapy (so that all eligible patients with coronary heart disease over 35 years of age take aspirin for 25 years) would have an estimated cost-effectiveness ratio of about $11,000 per quality-adjusted year of life gained.[15] In comparison to other preventive interventions and to commonly accepted cost-effectiveness benchmarks, the increased prescription of aspirin for secondary prevention of CHD is cost-effective.

| Preventive Intervention Information | |
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| **Preventive Intervention: Purpose of Counseling** | There is good evidence that aspirin decreases the incidence of coronary heart disease in adults who are at increased risk for heart disease. Therefore, clinician discussion of the benefits and harms with their patients who are at increased risk for heart disease is indicated.[2] |
| **Benefits and Risks of Intervention** | Aspirin can prevent myocardial infarctions but adds to the risk of gastrointestinal bleeding and increases the risk of hemorrhagic stroke, especially among older people and people with hypertension. The net benefit of aspirin increases with growing cardiovascular risk.[16] Although older patients may derive greater benefits because they are at higher risk for CHD and stroke, their risk of bleeding may also be higher. Uncontrolled hypertension may attenuate the benefits of aspirin in reducing CHD,[2] and, uncontrolled hypertension and concomitant use of non-steroidal anti-inflammatory agents or anticoagulants increase risk for serious bleeding.[16]<br><br>Here is an illustration of the relationship between the benefits and risks of the preventive intervention: For 1,000 patients with a 5% risk of CHD event(s) over 5 years, aspirin would prevent 14 myocardial infarctions (range 6 to 20), but would cause one hemorrhagic stroke (range 0 to 2), and 3 major gastrointestinal bleeds (range 2 to 4). In contrast, for patients with CHD risk of only 1% over 5 years, aspirin would prevent 3 myocardial infarctions (range 1 to 4), but would cause 1 hemorrhagic stroke (range 0 to 2) and 3 major gastrointestinal bleeding events (range 2 to 4).[7] |
| **Initiation, Cessation, and Interval of Counseling** | According to the USPSTF, physicians should inform adults who are at increased risk for CHD of the benefits and risks of aspirin therapy.[2] The AHA's recommendation is primarily based on physician discretion.<br><br>Although the optimal timing and frequency of discussions related to aspirin therapy are unknown, reasonable options include every 5 years in middle-aged and older people or whenever cardiovascular risk factors are detected.[16] |
| **Intervention Process** | Counseling and discussion methods are left to the discretion of the clinician. Discussions about aspirin therapy should focus on potential CHD benefits, such as prevention of myocardial infarction, and potential harms, such as gastrointestinal and intracranial bleeding. Discussions should take into account individual attitudes and risk preferences about myocardial infarction, stroke, and gastrointestinal bleeding.[2] |
| **Treatment Information** | When it is determined that the benefits of intervention outweigh the risks of intervention, physicians should encourage patients to take aspirin for the prevention of cardiovascular disease events. The optimum dose of aspirin for prevention is not known. Primary and secondary prevention trials have demonstrated benefits with a variety of regimens, including 75 |

mg per day, 100 mg per day and 325 mg every other day. Doses of approximately 75 mg per day appear as effective as higher doses[17] whether doses below 75 mg per day are effective has not been established. Enteric-coated or buffered preparations do not clearly reduce adverse gastrointestinal effects of aspirin.[16]

## Strength of Evidence for the Clinical Preventive Service

The level of evidence supporting the recommendations contained in this chapter is described below.

***Evidence-Based Research:***

U.S. Preventive Services Task Force (USPSTF)
Strength of Evidence: A (Strongly Recommended/Good Evidence)
• The USPSTF strongly recommends that clinicians discuss aspirin chemoprevention with adults who are at increased risk for coronary heart disease (CHD).[2]

***Recommended Guidance:***

American Diabetes Association (ADA)

Strength of Evidence: A, B, E

E (Based on Expert Opinion)
- The ADA recommends that physicians consider aspirin therapy in patients between that ages of 30 to 40 years, particularly when there is the presence of other cardio-vascular risk factors.[5]

A (Based upon clear evidence from randomized control trials)
B (Based upon supportive evidence from well-controlled cohort studies)
- The ADA recommends the use of aspirin therapy (75-162 mg/day) as a primary prevention strategy in those with either type 2 diabetes (A rating) or type 1 diabetes (B rating) who are over 40 years of age or have additional risk factors (family history of CVD, hypertension, smoking, dyslipidemia, or albuminuria).[5]

American Heart Association (AHA)
Strength of Evidence: Evidence from clinical trials
- The AHA recommends aspirin use for patients who have had a myocardial infarction (heart attack), unstable angina, ischemic stroke (caused by blood clot) or transient ischemic attacks (TIAs or “little strokes”), if not contraindicated. This recommendation is based on sound evidence from clinical trials showing that aspirin helps prevent the recurrence of such events. Studies show aspirin also helps prevent these events from occurring in people at high risk.[6]

## Authored by:

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