

ICSI Institute for Clinical Systems Improvement

Health Care Guideline Stable Coronary Artery Disease

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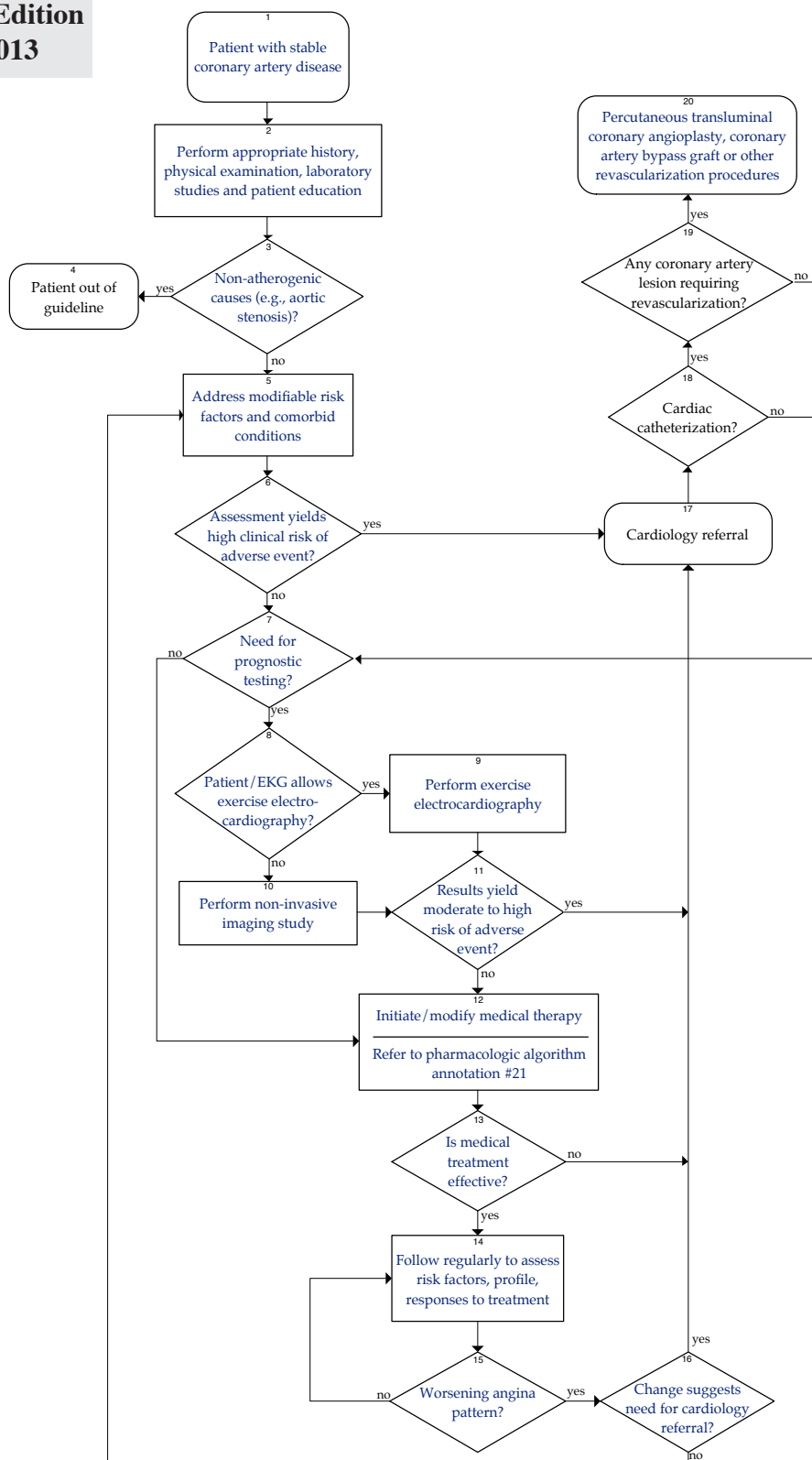
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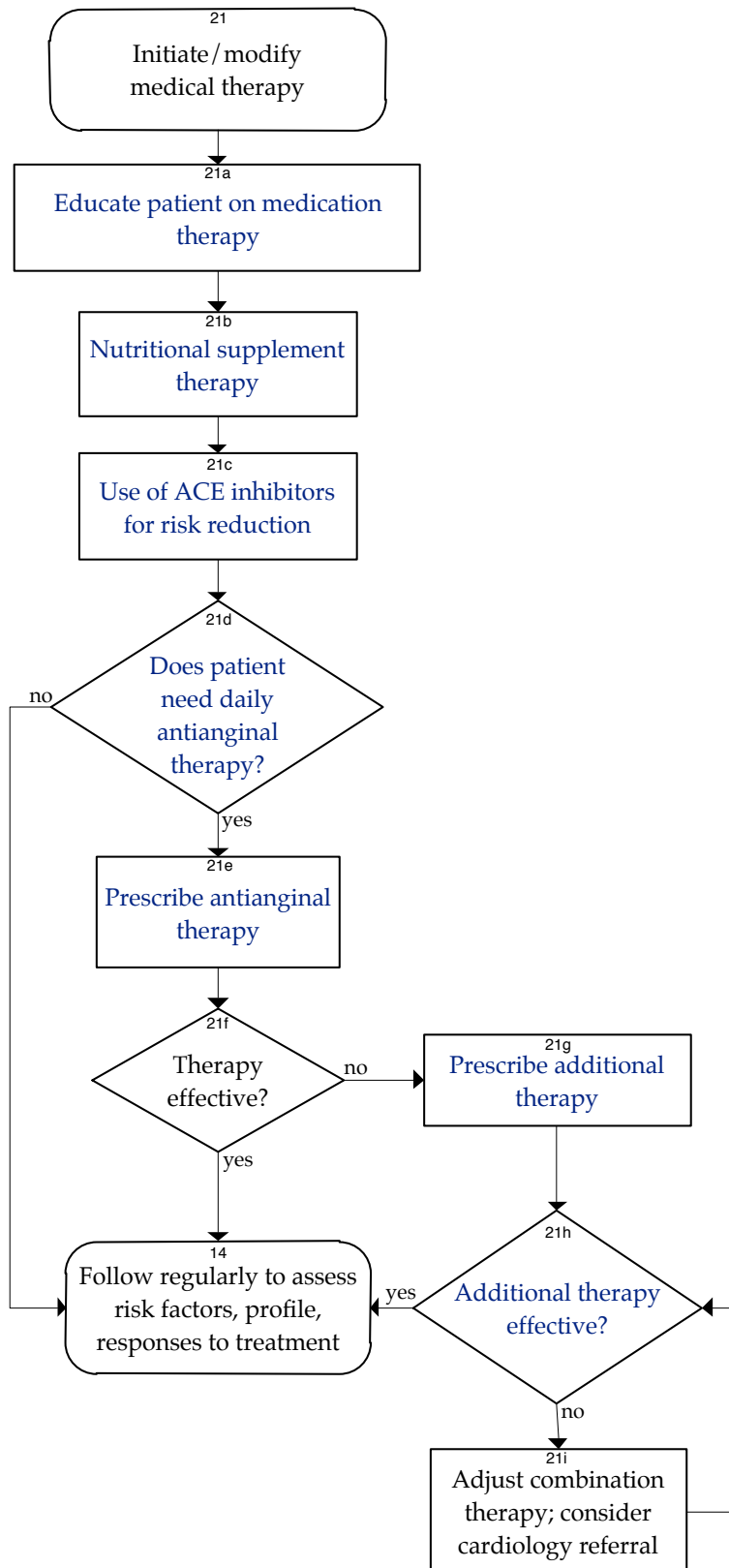
Main Algorithm

Text in blue in this algorithm indicates a linked corresponding annotation.



Pharmacologic Algorithm

Text in blue in this algorithm indicates a linked corresponding annotation.



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Evidence Grading

Literature Search

A consistent and defined process is used for literature search and review for the development and revision of ICSI guidelines. The literature search was divided into two stages to identify systematic reviews, (stage I) and randomized controlled trials, meta-analysis and other literature (stage II). Literature search terms used for this revision are below and include literature from July 2009 through November 2012.

In performing the literature search, the following data bases were used: Pub Med, Cochrane Library, AHRQ.

The search terms used were stable coronary artery disease; vitamin D; statins; hypertension; high blood pressure; hyperlipidemia; medical treatment versus revascularization; depression; obesity; SSRI's; sustained release niacin; age, gender and ethnicity; beta-blockers; homocysteine; amiodarone; refractory angina; diabetes; exercise electrocardiography and aspirin.

GRADE Methodology

Following a review of several evidence rating and recommendation writing systems, ICSI has made a decision to transition to the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system.

GRADE has advantages over other systems including the current system used by ICSI. Advantages include:

- developed by a widely representative group of international guideline developers;
- explicit and comprehensive criteria for downgrading and upgrading quality of evidence ratings;
- clear separation between quality of evidence and strength of recommendations that includes a transparent process of moving from evidence evaluation to recommendations;
- clear, pragmatic interpretations of strong versus weak recommendations for clinicians, patients and policy-makers;
- explicit acknowledgement of values and preferences; and
- explicit evaluation of the importance of outcomes of alternative management strategies.

This document is in transition to the GRADE methodology

Transition steps incorporating GRADE methodology for this document include the following:

- Priority placed upon available Systematic Reviews in literature searches.
- All existing Class A (RCTs) studies have been considered as high quality evidence unless specified differently by a work group member.
- All existing Class B, C and D studies have been considered as low quality evidence unless specified differently by a work group member.
- All existing Class M and R studies are identified by study design versus assigning a quality of evidence. Refer to Crosswalk between ICSI Evidence Grading System and GRADE.
- All new literature considered by the work group for this revision has been assessed using GRADE methodology.

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Evidence Grading

Crosswalk between ICSI Evidence Grading System and GRADE

ICSI GRADE System	Previous ICSI System
High , if no limitation	Class A: Randomized, controlled trial
Low	Class B: [observational] Cohort study
Low Low *Low	Class C: [observational] Non-randomized trial with concurrent or historical controls Case-control study Population-based descriptive study Study of sensitivity and specificity of a diagnostic test
* Following individual study review, may be elevated to Moderate or High depending upon study design	
Low	Class D: [observational] Cross-sectional study Case series Case report
Meta-analysis Systematic Review Decision Analysis Cost-Effectiveness Analysis	Class M: Meta-analysis Systematic review Decision analysis Cost-effectiveness analysis
Low Low Low	Class R: Consensus statement Consensus report Narrative review
Guideline	Class R: Guideline
Low	Class X: Medical opinion

Evidence Definitions:

High Quality Evidence = Further research is very unlikely to change our confidence in the estimate of effect.

Moderate Quality Evidence = Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

Low Quality Evidence = Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate or any estimate of effect is very uncertain.

In addition to evidence that is graded and used to formulate recommendations, additional pieces of literature will be used to inform the reader of other topics of interest. This literature is not given an evidence grade and is instead identified as a **Reference** throughout the document.

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Foreword

Scope and Target Population

Adults age 18 years or older who have a diagnosis of stable coronary artery disease. The criteria, as noted on the Main algorithm, includes patient presenting with:

- previously diagnosed coronary artery disease (CAD) without angina, or symptom complex that has remained stable for at least 60 days;
- no change in frequency, duration, precipitating causes or ease of relief of angina for at least 60 days; and
- no evidence of recent myocardial damage.

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Aims

1. Increase the percentage of patients age 18 years and older with a diagnosis of stable coronary artery disease (SCAD) who are prescribed aspirin and antiatherosclerotic medications. (*Annotations #21a, 21c*)
2. Increase the percentage of patients age 18 years and older with a diagnosis of stable coronary artery disease who understand the self-management of their condition. (*Annotations #2, 21a*)
3. Increase the percentage of patients age 18 years and older with a diagnosis of stable coronary artery disease who receive education and an intervention for modifiable risk factors. (*Annotation #5*)
4. Increase the use of angiotensin-converting enzyme (ACE) inhibitors or angiotensin II receptor blockers (ARBs) in patients with stable coronary artery disease with systolic CHF (ejection fraction less than or equal to 40%), including those patients with a comorbidity diagnosis of chronic kidney disease and/or diabetes mellitus. (*Annotation #21c*)
5. Increase appropriate risk assessment and stress imaging for stable coronary artery disease patients to determine risk stratification prior to decisions on medical therapy and revascularization. (*Annotation #7*)

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Clinical Highlights

- Prescribe aspirin in patients with stable coronary artery disease if there are no medical contraindications. (*Annotations #2, 21a; Aim #1*)
- Evaluate and treat the modifiable risk factors, which include smoking, sedentary activity level, depression, hyperlipidemia, obesity, hypertension and diabetes. (*Annotation #5; Aim #3*)
- Patients with chronic stable coronary artery disease should be on statin therapy regardless of their lipid levels unless contraindicated. (*Annotation #21a; Aim #3*)
- Perform prognostic testing in patients whose risk determination remains unclear. This may precede or follow an initial course of pharmacologic therapy. (*Annotation #7; Aim #7*)
- Refer the patient for cardiovascular consultation when clinical assessment indicates the patient is at high risk for adverse events, the non-invasive imaging study or electrocardiography indicates the patient is at high risk for an adverse event, or medical treatment is ineffective. (*Annotations #15, 16; Aim #4*)

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- For relief of angina, prescribe beta-blockers as first-line medication. If beta-blockers are contraindicated, nitrates are the preferred alternative. Calcium channel blockers may be an alternative medication if the patient is unable to take beta-blockers or nitrates. (*Annotations #21a, 21e; Aim #1*)

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Implementation Recommendation Highlights

The following system changes were identified by the guideline work group as key strategies for health care systems to incorporate in support of the implementation of this guideline.

- Develop systems for providing patient education around:
 - Proper use of nitroglycerin
 - Consistent use of aspirin (unless contraindicated) or consistent use of clopidogrel as directed
 - When to call 911

Education should also provide for patient to "teach back" in order to demonstrate their understanding of what they should do in an acute cardiac event.

- Develop/provide patients education materials around use of aspirin (unless contraindicated) and interventions around modifiable risk factors.
- Provide patient education around the use and benefits of angiotensin-converting enzymes (ACE inhibitors) and/or angiotensin II receptor blockers (ARBs).

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Related ICSI Scientific Documents

Guidelines

- [Diagnosis and Treatment of Chest Pain and Acute Coronary Syndrome \(ACS\)](#)
- [Healthy Lifestyles](#)
- [Heart Failure in Adults](#)
- [Hypertension Diagnosis and Treatment](#)
- [Lipid Management in Adults](#)
- [Major Depression in Adults in Primary Care](#)
- [Diagnosis and Management of Type 2 Diabetes Mellitus](#)
- [Preventive Services for Adults](#)
- [Prevention and Management of Obesity for Adults](#)

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Definition

Clinician – All health care professionals whose practice is based on interaction with and/or treatment of a patient.

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Algorithm Annotations

Main Algorithm Annotations

1. Patient with Stable Coronary Artery Disease

This guideline applies to patients with coronary artery disease either with or without angina. The population of patients with chronic coronary disease includes patients with stable angina, prior myocardial infarctions, prior percutaneous revascularization, coronary artery bypass graft (CABG), angiographically proven coronary atherosclerosis, or reliable non-invasive evidence of myocardial ischemia. Historically, the angiographic diagnosis was made by visualization of at least moderate to severe coronary stenosis on invasive coronary angiogram. With recent advances of non-invasive coronary imaging with computed tomography angiography (CTA), extrapolation of previous definition of significant coronary stenosis to CTA became widely accepted. It has been clearly demonstrated that the burden of coronary atherosclerosis appreciated on CT angiography parallels clinical outcomes. In addition, high coronary calcium score above 400 portends significantly elevated risk of future cardiovascular outcomes (*Fihn, 2012 [Guideline]*). This statement does not endorse CTA for screening purposes, but if previous results of CTA are available, there is a fair amount of data that the results constitute diagnostic and prognosis information. Contrary to CTA, coronary calcium score is a reasonable screening tool for cardiovascular risk assessment in persons with intermediate cardiovascular risk (10-20% 10-year risk).

A patient presenting with stable angina must meet all the following criteria (*Rutherford, 1992 [Low Quality Evidence]*; *Hurst, 1990 [Low Quality Evidence]*; *Shub, 1990 [Low Quality Evidence]*):

- Symptom complex has remained stable for at least 60 days
- No significant change in frequency, duration, precipitating causes or ease of relief of angina for at least 60 days
- No evidence of recent myocardial damage

The patient may already have undergone some diagnostic workup as a result of a prior presentation of chest pressure, heaviness and/or pain with or without radiation of the pain and/or shortness of breath. The clinician should have heightened awareness that many patients have atypical symptoms that reflect cardiac ischemia, especially patients with diabetes, women and the elderly. Initial care of such patients falls under the auspices of the ICSI [Diagnosis and Treatment of Chest Pain and Acute Coronary Syndrome \(ACS\)](#) guideline.

The definition of myocardial infarction was updated in 2012 by the Third Universal Definition of Myocardial Infarction Expert Consensus Document (*Thygesen, 2012 [Low Quality Evidence]*).

The criteria for prior myocardial infarction include:

- pathologic Q waves on EKG, with or without symptoms, in the absence of non-ischemic causes; or
- imaging evidence of a region of loss of viable myocardium that is thinned and fails to contract, in the absence of non-ischemic cause

The diagnosis of acute MI requires an evidence of myocardial necrosis in a clinical setting consistent with this syndrome. In addition to a rise and fall of cardiac biomarkers, preferably cardiac troponins, with at least one value above the 99th percentile upper reference of limit, at least ONE additional clinical finding is required:

- Symptoms of myocardial ischemia
- New EKG abnormalities (ST abnormalities, new left bundle branch block, development of pathologic Q waves)
- Imaging evidence of new loss of viable myocardium or new regional wall motion abnormality

Five types of myocardial infarctions were recently classified, but current guidelines apply to patients with previous type 1 myocardial infarction, which is related to spontaneous atherothrombotic event. Type 2 MI, or stress-induced MI, caused by mismatch of myocardial oxygen demand and delivery, is not included in the discussion of our guideline. The guideline's committee strongly discourages a diagnosis of acute MI, not meeting above listed criteria, specifically based solely on detection of elevated biomarker or due to clinically obvious non-ischemic release of biomarkers. Elevated troponin does indicate cardiac myonecrosis, but not a specific etiology. It must be emphasized that sensitivity and specificity of troponin are for myocardial necrosis, not myocardial infarction. Myocardial necrosis is a laboratory diagnosis, whereas MI is a clinical diagnosis. An elevated troponin level must be always put in the context of the clinical syndrome and the clinical pre-test likelihood of diagnosis of acute myocardial infarction.

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2. Perform Appropriate History, Physical Examination, Laboratory Studies and Patient Education

Recommendation:

- Patients with stable coronary artery disease should have clinical risk assessment of future cardiovascular events.

Thorough history taking and physical examination, including medication and compliance reviews, are important to confirm diagnosis, to assist in risk stratification, and to develop a treatment plan (*Rutherford, 1992 [Low Quality Evidence]; Shub, 1990 [Low Quality Evidence]*). Important points to elicit on history taking are:

- recognition that women may have atypical symptoms of cardiac ischemia. These may include fatigue, shortness of breath (SOB) without chest pain, nausea and vomiting, back pain, jaw pain, dizziness and weakness (*Harvard Medical School, 2005 [Low Quality Evidence]; Kordella, 2005 [Low Quality Evidence]; Bell, 2000 [Low Quality Evidence]*);
- history of previous heart disease;
- possible non-atheromatous causes of angina pectoris (e.g., aortic stenosis);
- comorbid conditions affecting progression of coronary artery disease;
- symptoms of systemic atherosclerosis (e.g., claudication, transischemic attack [TIAs] and bruits); and
- severity and pattern of symptoms of angina pectoris.

The physical examination should include a thorough cardiovascular examination, as well as evaluation for evidence of hyperlipidemia, hypertension, peripheral vascular disease, heart failure, anemia, thyroid disease and renal disease.

Initial laboratory studies should include an electrocardiogram and a fasting lipid profile (total cholesterol, HDL-cholesterol, calculated LDL-cholesterol and triglycerides). Further tests, based on history and physical examination findings, may include chest x-ray, measurement of hemoglobin, and tests for diabetes, thyroid function and renal function.

An important aspect to treatment of stable coronary artery disease is education to help the patient understand the disease processes, prognosis, treatment options and signs of worsening cardiac ischemia so that prompt medical assistance is sought when necessary and appropriate. Education may be accomplished in a number of ways among the various medical groups. It may be ongoing, occur in a formal class and/or be done at the clinician visit. Instruction on the proper use of aspirin and sublingual nitroglycerin, as needed, should also be reviewed at this time.

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Shared Decision-Making

Stable coronary artery disease patients can experience clinical situations, most often symptoms of angina or other signs of coronary ischemia, that lead to decision options they face with their family and clinicians. These decisions may involve stress imaging and coronary angiography; based on these results, further discussion involves the cardiologist, the primary care clinician and sometimes a cardiovascular surgeon. All attempts should be made to clearly discuss and outline the different risks and benefits of medical therapy combined with or as an option to revascularization therapies. While the patient and primary care clinician often depend greatly on the expertise of the specialists, every attempt should be made to share decision-making with the patient, especially when alternative treatment options yield similar clinical benefits. This can be done via personal care conferences involving the patient's family and providing relevant clinical data. Tools such as Crucial Conversations and other decision support tools can help the patient evaluate his or her decisions in light of personal values and other contributing factors. Please see [Appendix A, "ICSI Shared Decision-Making Model."](#)

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3. Non-Atherogenic Causes (e.g., Aortic Stenosis)?

Aortic stenosis is an important non-atherogenic cause of angina. This and any other non-atherogenic causes such as hypertrophic cardiomyopathy, heart failure, vasospasm and endothelial dysfunction are considered to be outside the scope of this clinical guideline (*Shub, 1990 [Low Quality Evidence]*).

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5. Address Modifiable Risk Factors and Comorbid Conditions

Recommendation:

- Depression should be routinely screened for and appropriately treated in patients with coronary heart disease.

Comorbid conditions that could affect myocardial ischemia may include hypertension, anemia, thyroid disease, hypoxemia and others.

Modifiable risk factors for coronary heart disease need to be evaluated and may include smoking, inadequate physical activity, depression, hyperlipidemia, obesity, hypertension and diabetes mellitus. Intervention involving any risk factor pertinent to the patient is encouraged and may include education, goal setting, and follow-up as necessary (*Rutherford, 1992 [Low Quality Evidence]*; *Shub, 1990 [Low Quality Evidence]*).

Please see [Appendix B, "Comorbid Conditions,"](#) for treatment recommendations in the presence of comorbid conditions.

Emerging Risk Factors

An association between homocysteine levels and cardiovascular disease has been demonstrated. The NORVIT trial and HOPE 2 trial found that folate and vitamins B6 and B12 did not reduce the risk of recurrent cardiovascular events in patients with vascular disease. These supplements cannot be recommended as routine treatment in patients with stable coronary artery disease (*Bønaa, 2006 [High Quality Evidence]*; *Heart Outcomes Prevention Evaluation (HOPE) 2 Investigators, 2006 [High Quality Evidence]*).

Lipoprotein (a) and highly sensitive C-reactive protein (hsCRP) may be valuable in select patients with diffuse coronary disease or diffuse atherosclerosis in multiple locations, particularly in those of young age (*Ridker, 2005 [Low Quality Evidence]*). Highly sensitive C-reactive protein has been shown to identify patients at higher risk of vascular events. Despite that, the main problem with widespread implementation of this marker is low specificity of hsCRP, lack of multiple trials confirming its additive value to traditional risk factors, lack of specific therapy and difficulties in sorting out the benefit of statin beyond LDL modification.

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Influenza and Pneumonia Vaccination

Patients with cardiovascular disease should have an influenza vaccination as recommended by the American College of Cardiology/American Heart Association (ACC/AHA) Chronic Stable Coronary Artery Disease guideline (*Fihn, 2012 [Guideline]*).

It is also recommended that pneumonia vaccination be administered according to the Centers for Disease Control and Prevention (CDC) 2010 Updated Recommendations for Prevention of Invasive Pneumococcal Disease Among Adults. Using the 23-Valent Pneumococcal Polysaccharide Vaccine (PPSV23) for patients between 19 to 64 years old with diagnosis of chronic stable angina (chronic heart disease), a PPSV23 should be administered at the time of diagnosis, and another dose of PPSV23 should be repeated when the patients become 65 years old or later if at least five years have passed since their previous dose. Those who receive PPSV23 at or after age 65 years should receive only a single dose (*Centers for Disease Control and Prevention, 2012 [Guideline]*).

Smoking

Cigarette smoking may cause an acute cardiac ischemic event and may interfere with the efficacy of medications to relieve angina.

Please refer to the ICSI [Preventive Services for Adults](#) guideline for recommendations regarding smoking cessation.

Sedentary Activity Level

An important aspect of the clinician's role is to counsel patients regarding appropriate work, leisure activities and eating habits. Patients should be encouraged to exercise regularly to obtain cardiovascular benefit and to enhance their quality of life. The American College of Cardiology (ACC) endorses a minimum schedule of 30 minutes of aerobic activity, such as brisk walking at least five (preferably seven) times per week, supplemented by an increase in daily lifestyle activities (walking breaks at work, gardening, etc.). Medically supervised programs are recommended for moderate- to high-risk patients. Exercise can be an important adjunct to modification of risk factors such as hypertension, hyperlipidemia and obesity. In addition, it can enhance patients' perception of their quality of life. Strenuous activities should be modified if they produce severe or prolonged angina; caution is needed to avoid consistent reproduction of ischemic symptoms or situations that may precipitate ischemic complications. Education is critical in achieving these goals. A study (*Hambrecht, 2004 [High Quality Evidence]*) showed less progression of coronary artery disease and significantly fewer ischemic events in patients who regularly exercised. Involvement of patients with known coronary artery disease in competitive sports or very strenuous prolonged exercise is not advised. In observation data of patients over age 35 who suffered cardiac arrest during strenuous activity, a majority of them had organic heart disease, predominantly coronary disease. This fact does not negate an overwhelming benefit of low to moderate exercise programs for patients with known CAD (*Kim, 2012 [Low Quality Evidence]; Smith, 2012 [Guideline]*).

A study (*Hambrecht, 2004 [High Quality Evidence]*) showed less progression of coronary artery disease and significantly fewer ischemic events in patients who regularly exercised.

The 2008 Physical Activity Guidelines for Americans recommends the following:

Adults (age 18-64)

- Adults should do 2 hours and 30 minutes a week of moderate-intensity, or 1 hour and 15 minutes (75 minutes) a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous-intensity aerobic physical activity. Aerobic activity should be performed in episodes of at least 10 minutes, preferably spread throughout the week.

Algorithm Annotations

- Additional health benefits are provided by increasing to 5 hours (300 minutes) a week of moderate-intensity aerobic physical activity, or 2 hours and 30 minutes a week of vigorous-intensity physical activity, or an equivalent combination of both.
- Adults should also do muscle-strengthening activities that involve all major muscle groups performed on two or more days per week.

Older adults (age 65 and older)

- Older adults should follow the adult guidelines. If this is not possible due to limiting chronic conditions, older adults should be as physically active as their abilities allow. They should avoid inactivity. Older adults should do exercises that maintain or improve balance if they are at risk of falling.

For all individuals, some activity is better than none. Physical activity is safe for almost everyone, and the health benefits of physical activity far outweigh the risks. People without diagnosed chronic conditions (such as diabetes, heart disease or osteoarthritis) who do not have symptoms (e.g., chest pain or pressure, dizziness or joint pain) do not need to consult with a health care clinician about physical activity.

Health Benefits of Physical Activity – A Review of the Strength of the Scientific Evidence

Adults and older adults (*U.S. Department of Health and Human Services, 2008 [Guideline]*)

Strong Evidence

- **Lower risk of:**
 - Early death
 - Heart disease
 - Stroke
 - Type 2 diabetes
 - High blood pressure
 - Adverse blood lipid profile
 - Metabolic syndrome
 - Colon and breast cancers
- Prevention of weight gain
- Weight loss when combined with diet
- Improved cardiorespiratory and muscular fitness
- Prevention of falls
- Reduced depression
- Better cognitive function (older adults)

Moderate to Strong Evidence

- Better functional health (older adults)
- Reduced abdominal obesity

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Algorithm Annotations

Moderate Evidence

- Weight maintenance after weight loss
- Lower risk of hip fracture
- Increased bone density
- Improved sleep quality
- Lower risk of lung and endometrial cancers

(U.S. Department of Health and Human Services, 2008 [Guideline])

Depression

Depressive symptoms are common in patients with stable coronary artery disease patients, with prevalence estimates ranging from 15 to 30% (Kop, 2001 [Low Quality Evidence]). Depression can be triggered by a major cardiac event (Thombs, 2006 [Systematic Review]), and is an independent risk factor for coronary artery disease (Khawaja, 2009 [Meta-analysis]). It increases all-cause mortality and cardiac complications in patients with coronary artery disease (Empana, 2006 [Low Quality Evidence]). The American Heart Association recommends that depression be routinely screened for and appropriately treated in patients with coronary heart disease (Lichtman, 2008 [Low Quality Evidence]). A tool such as the PHQ-9 can be useful to support the patient in processing the changes they are experiencing (Hansen, 2003 [Low Quality Evidence]).

In The Heart and Soul Study, a prospective cohort study by Whooley, patients with depressive symptoms, defined as a PHQ-9 score of ≥ 10 , were significantly more likely to experience a cardiovascular event over a mean of 4.8 years. This difference was largely explained by behavioral factors, especially physical inactivity, that was greater in depressed patients (Whooley, 2008 [Low Quality Evidence]).

A study by Glassman using sertraline in SCAD patients with major depression found clinical efficacy without significant cardiac side effects. There was a trend toward fewer severe cardiac events in the sertraline-treated group (Glassman, 2002 [High Quality Evidence]).

Effects of Citalopram and Interpersonal Psychotherapy on Depression in Patients with Coronary Artery Disease, the Canadian Cardiac Randomized Evaluation of Antidepressant and Psychotherapy Effect (CREATE) trial documents efficacy of citalopram for major depression in SCAD patients (Lespérance, 2007 [High Quality Evidence]).

Cohen, et al. reports excess risk of myocardial infarction in patients treated with tricyclic but not SSRIs antidepressants in a cohort of 2,247 working union health plan members in an accrual period of 12 months (Cohen, 2000 [Low Quality Evidence]).

Based on the above information, selective serotonin reuptake inhibitors (SSRIs) are preferred in the treatment of SCAD patients with major depression. It is also prudent not to exceed maximum SSRI daily dose due to possible risk of QTc prolongations (<http://www.fda.gov/Drugs/DrugSafety/ucm297391.htm>).

Please see the ICSI [Major Depression in Adults in Primary Care](#) guideline for more information on the treatment of depression.

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Hyperlipidemia

A fasting lipid profile should be evaluated for appropriate patients with stable coronary artery disease. Secondary prevention is important in these patients, who should be treated aggressively for hyperlipidemia. Many patients will require both pharmacologic and non-pharmacologic interventions to reach target goals. Target goals for hyperlipidemic patients with coronary artery disease include:

LDL – less than 100 mg/dL for all patients, ideal less than 70 mg/dL especially for high-risk patients

HDL – 40 mg/dL or greater

Triglycerides – less than 150 mg/dL

Please refer to the ICSI [Lipid Management in Adults](#) guideline for recommendations on lowering lipid levels.

Obesity

The American Heart Association considers obesity to be a major risk factor for coronary artery disease. Obesity is defined as a body mass index greater than or equal to 30. BMI provides a reasonable indicator of excess body fat that may lead to health problems. Obesity is a major risk factor for cardiovascular disease, certain types of cancer, dyslipidemia, hypertension and type 2 diabetes. Of adults age 20 or older, two-thirds are considered to be overweight or obese and more than one-third are considered to be obese (*Flegal, 2012 [Low Quality Evidence]*).

Waist circumference (WC) is also an important measurement because evidence suggests that abdominal fat is particularly a strong determinant of cardiovascular risk in those with a BMI of 25-34.9 kg/m². Men are at high relative risk if they have a WC greater than 40 inches; women are at high risk if they have a WC > 35 inches.

The initial target goal of weight-loss therapy for overweight patients is to decrease body weight by about 10%. The rationale for this initial goal is that even moderate weight loss, e.g., 10% of initial body weight, can significantly decrease the severity of obesity-associated risk factors.

Hypertension

General health measures include the treatment of hypertension, which is not only a risk factor for development and progression of atherosclerosis, but also causes cardiac hypertrophy, augments myocardial oxygen requirements, and thereby intensifies myocardial ischemia in patients with obstructive coronary disease.

Please refer to the ICSI [Hypertension Diagnosis and Treatment](#) guideline for recommendations regarding blood pressure management. The recommended target blood pressure is 140/90 mmHg or less. Based on current evidence, pursuing blood pressure goals lower than < 140/90 should be considered on an individual patient basis based on clinical judgment and patient preference (*ACCORD Study Group, 2010 [High Quality Evidence], Cooper-DeHoff, 2010 [Meta-analysis]*). Please see ICSI [Hypertension Diagnosis and Treatment](#) guideline for more information.

Diabetes

Diabetes is associated with a marked increase in coronary artery disease. Patients with diabetes without known coronary artery disease have as high risk of a myocardial infarction as patients without diabetes with coronary artery disease. Therefore, patients with diabetes should have aggressive lipid and blood pressure management (similar to patients with coronary artery disease), and should be treated per the recommendations of the ICSI [Diagnosis and Management of Type 2 Diabetes Mellitus in Adults](#) guideline, ICSI [Lipid Management in Adults](#) guideline and ICSI [Hypertension Diagnosis and Treatment](#) guidelines.

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Algorithm Annotations

Please refer to the ICSI [Management of Type 2 Diabetes Mellitus](#) guideline for recommendations regarding management of diabetes.

Every attempt should be made to achieve meticulous glucose control in patients with diabetes, because there is a clear relationship between lower hemoglobin A1c's and lower risk of myocardial infarction (*Haffner, 1998 [Low Quality Evidence]*). In the UKPDS (*United Kingdom Prospective Diabetes Study Group, 1998 [High Quality Evidence]*), obese patients with type 2 diabetes who were treated with metformin showed a statistically significant reduction in rates of myocardial infarction, suggesting metformin as a possible therapy of choice for these patients. A meta-analysis (*Selvin, 2004 [Meta-analysis]*) showed a 20% increase in cardiovascular events and mortality for every 1% increase in HbA1c over 5%.

The Action to Control Cardiovascular Risk in Diabetes (ACCORD) trial showed an increase rate of mortality in the intensive treatment arm compared to the standard arm (hazard ratio of 1.22), and there was a similar increase in cardiovascular deaths (*ACCORD, 2008 [High Quality Evidence]*). Many of these patients were treated with insulin and multiple oral agents, with a target of A1c < 6. There were more hypoglycemic reactions in the intensively treated group, and more weight gain compared to the standard treatment group. Compared to other trials of intensive control, patients in the ACCORD trial may have had diabetes for a longer period of time and started with a higher A1c before entering the intensive treatment arm. Implications for SCAD patients can be summarized in a joint paper published by the American Diabetes Association, the American College of Cardiology, and the American Heart Association (*Skyler, 2009 [Low Quality Evidence]*). In general, older, more frail SCAD patients with more comorbid disease (like chronic kidney disease) may be at greater risk for hypoglycemia and other complications of intensive diabetes therapy; perhaps patients such as these should be allowed higher A1c goals, such as maintaining A1c < 8.0. Other SCAD patients with a more recent diagnosis of diabetes, and those with less risk for hypoglycemia and other complications of intensive treatment will still warrant aggressive therapy to a target of < 7.0. For all patients, lifestyle modification, including exercise, smoking cessation, achieving and maintaining ideal body weight, and proven risk factor reduction (*Boden, 2007 [High Quality Evidence]*) will continue to be the focus of primary and secondary cardiovascular disease prevention. The A1c goal should be individualized based on each patient's particular cardiovascular risk factors.

Hormone Therapy (HT)

The HERS II trial showed no cardioprotective benefit from hormone therapy, and in fact showed an increase in risk of other complications (breast cancer, venous thromboembolism, etc.) (*Hulley, 1998 [High Quality Evidence]*). Risk-benefit analyses unequivocally support NOT starting hormone therapy for primary prevention. Should a patient already on hormone therapy present with acute coronary syndrome or be at risk for venous thromboembolism (e.g., prolonged immobilization), hormone therapy should be discontinued immediately. Clinical judgment is required in making the decision whether to continue hormone therapy in other circumstances.

Cardiac Rehabilitation Referral

Cardiac rehabilitation (CR) services are comprehensive, long-term programs involving medical evaluation, prescribed exercise, cardiac risk factor modification, education and counseling. These programs are designed to limit the physiological and psychological effects of cardiac illness, reduce the risk for sudden death or re-infarction, control cardiac symptoms, stabilize or reverse the atherosclerotic process, and enhance the psychosocial and vocational status of selected patients (*Wenger, 1995 [Guideline]*). CR is considered a class I American Heart Association/American College of Cardiology recommendation for secondary CAD prevention. CR referral is included in the ACC/AHA/AMA performance measures for patients with CAD. A systematic review of randomized controlled trials show that CR decreases mortality rates, cardiovascular mortality rates and hospital admissions compared to usual care (*Drozda, 2011, [Guideline]; Heran, 2011 [Systematic Review]; Smith, 2011 [Guideline]*).

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In a study done at Mayo Clinic's Cardiovascular Health Clinic, it was found that patients who participate in cardiac rehabilitation after having percutaneous coronary intervention found a significant reduction in all-cause and cardiovascular mortality (*Kashish, 2011 [Low Quality Evidence]*).

Patients who are considered eligible for cardiac rehabilitation include those who have experienced one or more of the following conditions as a primary diagnosis sometime within the previous year (*Thomas, 2007 [Guideline]*):

- MI/acute coronary syndrome
- Coronary artery bypass graft surgery
- Percutaneous coronary intervention
- Stable angina
- Heart valve repair/replacement
- Heart transplantation

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6. Assessment Yields High Clinical Risk of Adverse Event?

Some patients are considered to be at high risk for infarction or death on the basis of history, physical examination and initial laboratory findings. Patients presenting with accelerating symptoms of angina (NYHA [New York Heart Association] Class III or IV, see [Appendix C, "Grading of Angina Pectoris"](#)), symptoms of peripheral vascular disease, or symptoms of left ventricular dysfunction should be referred to a cardiologist unless precluded by other medical conditions.

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7. Need for Prognostic Testing?

Prognostic testing is appropriate for patients in whom risk determination remains unclear after initial evaluations have been completed, or in whom cardiac catheterization is deemed inappropriate by the cardiologist. Prognostic testing may precede or follow an initial course of pharmacological therapy (*Shub, 1990 [Low Quality Evidence]*; *Frye 1989 [Low Quality Evidence]*). Please see ACC/AHA guideline on stress testing, which is an excellent resource for determining appropriate testing. Specific test depends on the expertise of your organization (*Balady, 2002 [Low Quality Evidence]*).

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8. Patient/Electrocardiogram Allows Exercise Electrocardiography?

Sensitivity of exercise electrocardiography (Masters 2-Step Exercise Test, Graded Exercise Test, Bicycle Test, Ergometry) may be reduced for patients unable to reach the level of exercise required for near maximal effort, such as:

Baseline ECG abnormalities:

- patients taking beta-blockers;
- patients in whom fatigue, dyspnea or claudication symptoms develop; and
- patients with vascular, orthopedic or neurological conditions who cannot perform leg exercises.

Imaging stress tests have advantages in the following conditions:

- Left bundle branch block (LBBB)
- Wolff-Parkinson-White Syndrome (WPW)
- Pace rhythm

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- Left ventricular hypertrophy (LVH) with strain
- > 1 mm ST segment depression at rest
- Digoxin therapy
- Prior coronary revascularization

This test adds accuracy and localized ischemia, measures LVEF and is useful information when combined with stress.

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9. Perform Exercise Electrocardiography

Most patients with normal resting electrocardiograms who can exercise and are not taking digoxin can undergo standard treadmill exercise testing.

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10. Perform Non-Invasive Imaging Study

A non-invasive imaging study such as myocardial perfusion scintigraphy or stress echocardiography should best meet the patient's needs while providing the most clinical usefulness and cost effectiveness within the clinician's institution. An imaging study should be selected through discussion with the cardiologist or imaging expert (*Frye, 1989 [Low Quality Evidence]*).

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11. Results Yield Moderate to High Risk of Adverse Event?

Exercise electrocardiography and stress test imaging studies may yield results that indicate high, intermediate or indeterminate or low risk of adverse clinical events. Overall, stress testing has moderate diagnostic but solid prognostic value for prediction of cardiovascular events in the next few years. High- and intermediate-risk patients, based on results of stress testing, should have a cardiology consultation for discussion of the risks and benefits of medical therapy, invasive procedures and revascularization options. Patients who are indeterminate risk may benefit from cardiology consultation and/or further non-invasive imaging. Low-risk patients can generally be managed medically, with a good prognosis. Low-risk patients may benefit from angiography if the diagnosis remains unclear; however, angiography is unlikely to alter outcome in these patients.

The main benefit of coronary revascularization is alleviation of angina for the majority of chronic stable CAD patients. The benefit of reduction of myocardial infarction and death prevention is contained to a small group of stable patients with significant angina and/or ischemia burden and high-risk coronary anatomy (including significant left main stenosis, multivessel disease with proximal left anterior descending vessel involvement), specifically if there is a presence of left ventricular dysfunction, severe diffuse disease, or diabetes mellitus. Generally, surgical coronary revascularization for these patients is associated with superior long-term outcomes, including survival benefit over medical therapy and percutaneous revascularization (*Fihn, 2012 [Guideline]*).

The following findings help to determine the risk of future cardiovascular events:

High risk (above 3% annual death or MI)

1. Severe resting left ventricular dysfunction (left ventricular ejection fraction below 35%) not readily explained by non-coronary causes.
2. Resting perfusion abnormalities equal to or more than 10% of the myocardium in patients without prior history or evidence of MI.

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3. Stress ECG findings including equal to or more than 2 mm of ST-segment depression at low workload or persisting into recovery, exercise-induced ST-segment elevation, or exercise-induced ventricular tachycardia or ventricular fibrillation.
4. Severe stress-induced left ventricular dysfunction (peak exercise LVEF below 45% or drop in LVEF with stress equal to or more than 10%).
5. Stress-induced perfusion abnormalities encumbering equal to or more than 10% myocardium or stress segmental scores indicating multiple vascular territories with abnormalities.
6. Stress-induced LV dilation.
7. Inducible wall motion abnormality (involving more than two segments or two coronary beds).
8. Wall motion abnormality developing at low dose of dobutamine (equal or less than 10 mg/kg/min.) or at a low heart rate (equal or less than 120 beats/min.).
9. Coronary artery calcium (CAC) score above 400 Agatston units.
10. Multivessel obstructive coronary artery disease (CAD) (equal to or more than 70% stenosis) or left main stenosis (equal to or more than 50% stenosis) on CCTA.

Intermediate risk (1 to 3% annual death or MI)

1. Mild/moderate resting LV dysfunction (LVEF 35 to 49%) not readily explained by non-coronary causes.
2. Resting perfusion abnormalities in 5 to 9.9% of the myocardium in patients without a history or prior evidence of MI.
3. Equal to or more than 1 mm of ST-segment depression occurring with exertional symptoms.
4. Stress-induced perfusion abnormalities encumbering 5 to 9.9% of the myocardium or stress segmental scores (in multiple segments) indicating one vascular territory with abnormalities but without LV dilation.
5. Small wall motion abnormality involving 1 to 2 segments and only one coronary bed.
6. CAC score 100 to 399 Agatston units.
7. One vessel CAD with equal to or more than 70% stenosis or moderate CAD stenosis (50 to 69% stenosis) in two or more arteries on CCTA.

Low risk (less than 1% annual death or MI)

1. Low-risk treadmill score (score 5 or higher) or no new ST-segment changes or exercise-induced chest pain symptoms; when achieving maximal levels of exercise.
2. Normal or small myocardial perfusion defect at rest or with stress encumbering 5% or less of the myocardium*.
3. Normal stress or no change of limited resting wall motion abnormalities during stress.
4. CAC score below 100 Agatston units.
5. No coronary stenosis above 50% on CCTA.

*Although the published data are limited; patients with these findings will probably not be at low risk in the presence of either a high-risk treadmill score or severe resting LV dysfunction (LVEF below 35%).

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Abbreviations: CAC indicates coronary artery calcium; CAD, coronary artery disease; CCTA, coronary computed tomography angiography; LV, left ventricular; LVEF, left ventricular ejection fraction; and MI, myocardial infarction.

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12. Initiate/Modify Medical Therapy

In 2007 the COURAGE (Clinical Outcomes Utilizing Revascularization and Aggressive Drug Evaluation) trial implemented a rigorous therapeutic program for what has become known as Optimal Medical Therapy (OMT). Over a median of 4.6 years, 2,207 patients with objective evidence of myocardial ischemia were randomized to percutaneous coronary intervention (PCI) plus OMT, or OMT alone. The primary composite outcome (death from any cause or non-fatal MI) and secondary outcomes (death, MI, cardiovascular accident) were no different between the two treatment arms (*Maron, 2010 [Low Quality Evidence]*).

The COURAGE study patients received intensive lifestyle and pharmacologic intervention in clinic settings involving a highly structured clinical team including nurses, dietitians and pharmacists. Such a team approach will likely be necessary to implement the rigorous details of the COURAGE OMT (*Maron, 2010 [Low Quality Evidence]*).

Among patients with SCAD, once low-density lipoprotein (LDL) is controlled under 70 mg/dL with statin therapy, the addition of sustained-release niacin does not show clinical benefit regardless of the favorable increase of HDL from 35 to 42 mg/dL in the AIM-HIGH trial, which includes 3,414 patients over a three-year period (*Boden, 2011 [High Quality Evidence]*).

A large randomized, controlled clinical outcomes trial with dalcetrapib, a cholesteryl ester transfer protein (CETP) inhibitor, was terminated early because of a lack of clinically meaningful efficacy. Unlike with a previous CETP inhibitor torcetrapib, there were no safety concerns with dalcetrapib. Two other CETP inhibitors are under active investigation known as Randomized Evaluation of the Effects of Anacetrapib Through Lipid Modification (REVEAL) HPS2/TIMI55 trial, expected to be closed at 2017 and A Study of Evacetrapib in High-Risk Vascular Disease (ACCELERATE), expected to be completed at 2015.

Clinical evidence is still needed that using a pharmaceutical agent to increase HDL has mortality benefit in the treatment of SCAD.

In summary, a multidisciplinary approach for intensive lifestyle modification and medication therapy is the preferred approach in treating SCAD patients. The initial medication treatment goal for SCAD should include the following:

- For smoking, the goal was cessation.
- For total dietary fat, the goal was < 30% of calories and for saturated fat, < 7% of calories.
- For dietary cholesterol, the goal was < 200 mg/day.
- For physical activity, the goal was 30-45 minutes of moderate intensity five times a week.
- For body weight by BMI for those with a 25-27.5 BMI, the goal is < 25 BMI; for those with > 27.5 BMI, the goal is 10% relative weight loss.
- For blood pressure, the goal was < 140/90 mmHg.
- For LDL cholesterol, the goal was < 100 mg/dL; < 70 mg/dL was preferred for a high-risk group.
- For diabetes HbA1c, the goal was < 7.0%. The A1c goal should be individualized based on each patient's particular cardiovascular risk factors.
- Screen for depression.

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- Receive an annual influenza vaccination.
- Receive a pneumonia vaccination.

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13. Is Medical Treatment Effective?

Medical therapy is proven to be effective in treatment of symptoms and reduction of cardiovascular events in patients who underwent comprehensive cardiovascular evaluation. Although coronary revascularization relieves symptoms almost immediately, the long-term outcomes are equal in the medically treated and in those who receive the percutaneous intervention. A meta-analysis of randomized trials that compared intensive medical treatment of stable CAD patients with initial coronary stenting concluded similar rate of death, MI, unplanned revascularization or angina over 4.3 years of follow-up (*Stergiopoulos, 2012 [High Quality Evidence]*).

Comprehensive therapy including successful risk factor modification is of paramount importance. In the COURAGE trial, the goals of intensive therapy were achieved in over 80% of patients by utilization of protocol driven and administered by a nurse case manager systematic approach. This suggests that secondary prevention model (nurse case manager implementing behavioral assessment, counseling tools and treatment algorithms) is successful in initiating and maintaining positive lifestyle changes, the appropriate use and titration of medications to achieve treatment targets (*Maron, 2010 [Moderate Quality Evidence]*).

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14. Follow Regularly to Assess Risk Factors, Profile, Responses to Treatment

There is no consensus in the literature regarding frequency of follow-up; ongoing management needs and follow-up should be individualized (*Nease, 1995 [Low Quality Evidence]*).

Work group consensus recommends, at a minimum, clinical follow up every 4-6 months during the first year following diagnosis and then every 6-12 months as long as the condition remains stable. Laboratory follow-up consists of a lipid panel yearly and 3-4 months after change in therapy. Basic metabolic panel should be done yearly.

Patients should be strongly encouraged to call their clinician with symptom changes.

Patient perception of symptoms may impact the effect of the symptoms on quality of life and medical management.

Please refer to [Appendix C, "Grading of Angina Pectoris,"](#) for information on grading angina pectoris.

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15. Worsening Angina Pattern?

A new occurrence of angina or a worsening in the chronic stable angina pattern is considered to be present when any of the following occur:

- The symptom complex becomes less stable.
- There is change in frequency, duration, precipitating causes or ease in relief of angina.
- There is evidence of recent myocardial damage.

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16. Change Suggests Need for Cardiology Referral?

When such change is no longer managed by alterations in the pharmacologic therapy prescribed, cardiology consultation or referral for possible invasive intervention may be appropriate (*Gibbons, 2003 [Guideline]; Shub, 1990 [Low Quality Evidence]*).

Please see [Appendix C, "Grading of Angina Pectoris,"](#) for information on grading angina pectoris.

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20. Percutaneous Transluminal Coronary Angioplasty (PCTA), Coronary Artery Bypass Graft (CABG) or Other Revascularization Procedures

The relative benefits of revascularization compared with medical therapy are enhanced by an increase in absolute number of severely narrowed coronary arteries, the degree of left ventricular systolic dysfunction and the magnitude of myocardial ischemia. Among patients with lesser disease, percutaneous transluminal coronary angioplasty and coronary artery bypass graft have not been shown to reduce mortality or the risk of myocardial infarction, but do reduce the symptoms of angina and the intensity of antianginal therapy, as well as increase exercise capacity.

The COURAGE trial was a randomized controlled trial involving 2,287 patients with at least 70% stenosis in *at least one* coronary artery. They were randomized to either percutaneous transluminal coronary angiography (PTCA)/stenting or aggressive medical therapy. These patients were followed for a median of 4.6 years. The primary outcome was death from any cause and non-fatal myocardial infarction. Drug eluting stents weren't used, and some think that may make a difference.

(*Boden, 2007 [High Quality Evidence]; Ryan, 1993 [Low Quality Evidence]; Kirklin, 1991 [Low Quality Evidence]; Frye, 1989 [Low Quality Evidence]; Bourassa, 1988 [Low Quality Evidence]*).

Although the actual intervention of an invasive modality such as angiography, percutaneous transluminal coronary angioplasty or coronary artery bypass graft is outside this guideline and may be found within another, those patients undergoing such procedures may, at best, be restored to a chronic stable anginal pattern, thus continuing to receive medical treatment under the purview of this guideline.

Aggressive modification of cardiac risk factors in the COURAGE trial should be pursued if similar clinical results are to be obtained.

These interventions include (when clinically appropriate):

- Beta-blocker, non-dihydropyridine calcium channel blocker and/or nitrate, with ACE inhibitors or angiotensin receptor blocker.
- Aggressive HMG-CoA reductase Inhibitor (3-hydroxy-3-methyl-glutaryl-CoA reductase inhibitor, statin) therapy alone or in combination to target LDL of 70 mg per deciliter.
- Antiplatelet therapy

(*Boden, 2007 [High Quality Evidence]*)

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21a. Educate Patient on Medication Therapy

Recommendation:

- The use of one aspirin tablet daily (81 mg) is strongly recommended unless there are medical contraindications.

Antiplatelet Therapy

The use of one aspirin tablet daily (81 mg) is strongly recommended unless there are medical contraindications (*Kurth, 2003 [High Quality Evidence]*; *CAPRI, 1996 [High Quality Evidence]*; *Antiplatelet Trialists' Collaboration, 1994 [High Quality Evidence]*; *Fuster, 1993 [Low Quality Evidence]*; *Juul-Möller, 1992 [High Quality Evidence]*; *Ridker, 1991 [High Quality Evidence]*).

The Antithrombotic Trialists' Collaboration is a meta-analysis that analyzed 287 studies involving 135,000 patients for different aspects of antiplatelet therapy. When comparing the 500-1,500 mg versus 160-325 mg versus 75-150 mg daily regimens of aspirin in multiple trials, there was a trend of reduction in vascular events with decreased dose (odds reduction: 19% versus 26% versus 32%, respectively) (*Antithrombotic Trialists Collaboration, 2002 [Meta-analysis]*). Although the meta-analysis concludes that risk of gastrointestinal bleed was similar among doses 325 mg or less, other studies such as the CURE study showed increased bleeding risk with increasing the dose, without any increase in efficacy (*Peters, 2003 [High Quality Evidence]*).

The authors conclude that aspirin dose in the range of 75-150 mg should be given for the long-term prevention of serious vascular events in high-risk patients, and that there may be a reduced benefit when increasing the dose over 150 mg daily. Doses available to most clinicians are in increments of 81 mg; therefore, the recommended dose is 81 mg daily.

A multicenter case-controlled study by Kelly et al. on 550 incident cases of first-time major upper gastrointestinal bleed showed that the relative risks of bleeding in patients taking plain, enteric-coated and buffered aspirin at average daily dose of 325 mg or less were 2.6, 2.7 and 3.1, respectively (*Kelly, 1996 [Low Quality Evidence]*). The study cites few other endoscopic studies showing the opposite (gastro-protection of enteric-coated aspirin), but explains such differences by differences in trial design and population characteristics.

It remains difficult to conclude whether enteric-coated aspirin is gastro-protective or not, but clinicians should not assume that it is any safer than regular or buffered aspirin, and should treat it with the same level of caution.

Patients for whom aspirin is contraindicated (or insufficient) should be treated with clopidogrel 75 mg daily indefinitely (*Harrington, 2004 [Low Quality Evidence]*). The CHARISMA trial involved 15,603 patients with vascular disease or multiple atherothrombotic risk factors who were randomized to clopidogrel (75 mg daily) plus low-dose aspirin (75-162 mg daily) or placebo plus low-dose aspirin.

After a median follow-up of 28 months, there was no difference between the two groups in the trial's primary composite end point of myocardial infarction, stroke or death from cardiovascular causes, with an increased risk of moderate bleeding in the clopidogrel group. Rate of hospitalization was lower in the clopidogrel group when compared with placebo. Subgroup analysis showed (marginally significant) reduction in primary end point in those with documented atherothrombotic disease on the clopidogrel protocol. In contrast, those without documented atherothrombotic disease and only risk factors on the clopidogrel protocol had higher incidence of death from all causes and from cardiovascular causes. Accordingly, addition of clopidogrel to

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aspirin in stable coronary artery disease patients comes with little benefit and some cost, and should not be recommended on routine basis. However, there may be proven benefits of clopidogrel such as in the setting of acute vascular injury (percutaneous transluminal coronary angioplasty or acute coronary syndromes) or in selected patients with ongoing ischemic events on aspirin therapy (*Bhatt, 2006 [High Quality Evidence]*).

In appropriately selected patients, an aspirin dose of 81 mg is recommended for patients who are on chronic clopidogrel therapy. Different doses of aspirin may apply in the setting of acute coronary syndrome; refer to the [ICSI Diagnosis and Treatment of Chest Pain and Acute Coronary Syndrome \(ACS\)](#) guideline for aspirin dosing.

Examples of precautions/contraindications to aspirin are:

- Patients allergic to aspirin
 - Dose-related intolerance is not a contraindication for taking aspirin
- Patients with gastrointestinal disorders
 - Recent gastrointestinal bleeding and active treatment for peptic ulcer disease are contraindications.
 - The use of H-2 antagonists or proton pump inhibitor (PPI) is not a contraindication to aspirin use.
 - Consideration should be given for low-dose enteric-coated (81 mg) aspirin for patients with a questionable history of gastrointestinal disorders.
- Patients with recent intracranial bleeding
 - Intracranial bleeding within the past six weeks is a contraindication.
 - Any history of intracranial bleeding necessitates evaluation on a case-by-case basis.
- Patients with bleeding disorders or those receiving other anticoagulants
 - Certain patients receiving anticoagulants may justifiably be on aspirin, as well.
- Patients with uncontrolled hypertension
 - Systolic blood pressure is greater than 180 mmHg.
 - Diastolic blood pressure is greater than 110 mmHg.
- Patients regularly taking non-steroidal anti-inflammatory drugs (NSAIDs)
 - Combined use of aspirin and non-steroidal anti-inflammatory drugs may increase the risk of bleeding. Enteric-coated aspirin with careful monitoring for clinical signs of gastropathy may be an acceptable strategy for patients regularly taking non-steroidal anti-inflammatory drugs. Use of non-steroidal anti-inflammatory drugs and COX-2 inhibitors may reduce the cardioprotective benefits of aspirin. Regular, not intermittent, use of non-steroidal anti-inflammatory drugs inhibit the clinical benefits of aspirin. Caution should be used in prescribing COX-2 inhibitors to patients with coronary artery disease, because there is evidence of a class effect on cardiovascular risks (*U.S. Food and Drug Administration, 2006 [Low Quality Evidence]*; *Bresalier, 2005 [High Quality Evidence]*; *Nussmeier, 2005 [High Quality Evidence]*; *Solomon, 2005 [High Quality Evidence]*; *Mukherjee, 2001 [Low Quality Evidence]*).

In patients who have undergone drug-eluting stent (DES) placement for treatment of coronary artery disease, continuation of dual antiplatelet therapy with aspirin and thienopyridine is expected for a period of at least one year in the absence of contraindications (*Grines, 2007 [Low Quality Evidence]*). The

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importance of continued dual antiplatelet therapy during this period should be discussed with patients in an effort to improve compliance, and instructions should be given to contact a health care clinician prior to discontinuation of antiplatelet therapy for elective surgical or dental procedures. Due to the risk of catastrophic stent thrombosis, cessation of antiplatelet therapy should be carefully considered during the first year after drug-eluting stent (DES) implantation and particularly during the first three (post-sirolimus-eluting stent) or six months (paclitaxel-eluting stent). In combination with clopidogrel, the dose of aspirin should be 81 mg. Please refer to the ICSI [Diagnosis and Treatment of Chest Pain and Acute Coronary Syndrome \(ACS\)](#) guideline (Grines, 2007 [Low Quality Evidence]). Aspirin should be prescribed to all patients with stable coronary disease. If the patient is aspirin intolerant, use clopidogrel. See the ICSI [Antithrombotic Therapy Supplement](#) for more information.

Statins – HMG Co Aveductase Inhibitors (3-Hydroxy-3-Methy) – Glutaryl – Co Areductos Inhibition)

Many patients will require both pharmacologic and non-pharmacologic interventions to reach target goals. Target goals for hyperlipidemic patients with coronary artery disease include:

LDL – less than 100 mg/dL for all patients, ideal less than 70 mg/dL especially for high-risk patients

HDL – 40 mg/dL or greater

Triglycerides – less than 150 mg/dL

There is now an *ideal* LDL-C goal of less than 70 mg/dL for patients considered to be very high risk. Several trials have shown clinical benefit using high-dose statins to treat to lower LDL levels. The Treat to Numbers Trial (TNT) assigned 10,001 patients with stable coronary artery disease to either 80 mg atorvastatin with achieved LDL level of 77 mg/dL or a 10 mg dose with LDL level of 101 mg/dL, and followed them for a median of 4.9 years. In the high-dose group there was a 22% relative reduction in the primary outcome of death from coronary heart disease, non-fatal myocardial infarction, cardiac arrest and stroke. There was no reduction in overall mortality due to a 25% increase in non-cardiovascular deaths in the high-dose atorvastatin group. Another concern was significantly higher rates of side effects in the high-dose group, including myalgias and elevated liver enzymes; this higher rate of side effects occurred even with a run-in period that excluded patients intolerant to the study drug (LaRosa, 2005 [High Quality Evidence]). The Prove It TIMI-22 trial compared 4,162 patients with acute coronary syndrome treated with 80 mg of atorvastatin to 40 mg of pravastatin, and followed for a mean of 24 months. The atorvastatin group achieved an LDL level of 62 mg/dL, and the pravastatin group had an average LDL level of 95 mg/dL. There was a 16% reduction in the hazard ratio for the combined primary end point death, myocardial infarction, unstable angina, need for revascularization, and stroke. Most of the benefit occurred within 30 days of randomization and was unaccompanied by further incremental benefit through the end of the follow-up period (Ridker, 2005 [Low Quality Evidence]).

At present the clinician will need to individualize therapy with statins by the degree of risk in their patients, considering a target LDL of 70 or less, especially for patients at highest risks as described by Grundy (Grundy, 2004 [Low Quality Evidence]). Very high risk patients include patients with established cardiovascular disease plus any of the following: 1) multiple major risk factors, such as diabetes; 2) severe or poorly controlled risk factors, especially smoking; 3) metabolic syndrome associated risk factor (triglycerides greater than 200 mg/dL, HDL less than 40 mg/dL); and 4) patients with acute coronary syndromes. The benefits in reducing cardiac events with high-dose statin therapy will need to be weighed against the higher potential for side effects, and the potential for increased non-cardiac mortality as seen in the TNT trial, which is either real or due to chance. Further trials comparing different treatment intensities of statins should bring more clarity regarding which patients benefit most with the least side effects (LaRosa, 2005 [High Quality Evidence]).

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Benefit has been demonstrated in all stable coronary artery disease patients treated with statins, regardless of pretreatment cholesterol levels. This was well demonstrated in the MRC/BHF Heart Protection Study (*Heart Protection Study Collaborative Group, 2002 [High Quality Evidence]*). Simvastatin was shown to reduce major cardiovascular events, including death, non-fatal myocardial infarction, and stroke by 15-20% in the subgroup of patients with pretreatment levels of less than 100 mg/dL. A similar reduction in events was also observed in patients without documented coronary artery disease, but with peripheral vascular disease, diabetes or hypertension.

This recommendation reflects the analysis of the National Cholesterol (NCEP) report, the American College of Cardiology/American Heart Association (ACC/AHA) Chronic Stable Angina guideline, and compelling evidence of mortality reduction from multiple clinical trials (*Grundy, 2004 [Low Quality Evidence]*; *Gibbons, 2003 [Guideline]*; *Heart Protection Study Group, 2002 [High Quality Evidence]*; *Hunninghake, 1998 [High Quality Evidence]*).

Please refer to the ICSI [Lipid Management in Adults](#) guideline for recommendations on cholesterol lowering.

Every effort should be made to ensure all patients with coronary artery disease receive optimal lipid therapy. Statin medications are strongly supported as first-line medications due to compelling evidence of mortality reduction from multiple clinical trials (*Hunninghake, 1998 [High Quality Evidence]*; *Sacks, 1996 [High Quality Evidence]*; *Scandinavian Simvastatin Survival Study Group, 1994 [High Quality Evidence]*).

If patients are intolerant to a statin, clinicians are strongly encouraged to have the patient try other statins in reduced doses before ruling out all statins.

The PROSPER trial showed a significant risk reduction in myocardial infarction in the elderly; therefore, age alone should not preclude treatment. The Heart Protection Study also showed benefit in patients up to age 80 years (*Heart Protection Study Group, 2002 [High Quality Evidence]*; *Shepherd, 2002 [High Quality Evidence]*).

Patients with chronic stable coronary artery disease should be on statin therapy regardless of their lipid levels unless contraindicated.

As-Needed Nitrates

In patients with mild, stable coronary artery disease, drug therapy may be limited to short-acting sublingual nitrates on an as-needed basis. Use of lower dose (e.g., 0.3 mg or one-half of a 0.4 mg tablet) may reduce the incidence of side effects such as headache or hypotension in susceptible patients.

Beta-Blocking Agents

Beta-blockers should be used in all status post-myocardial infarction patients, based on studies showing mortality reduction. They are also the preferred first-line therapy for reducing symptoms of angina in patients with stable coronary artery disease. Drugs with intrinsic sympathomimetic activity should be avoided. Abrupt withdrawal of all beta-blockers should be avoided (*Cucherat, 1997 [High Quality Evidence]*; *Shub, 1990 [Low Quality Evidence]*; *Frye, 1989 [Low Quality Evidence]*).

Ranolazine

Ranolazine is a stand-alone late sodium channel blocker; it relieves stable angina symptoms and increases exercise tolerance. It demonstrates antianginal and anti-ischemic effects without changing hemodynamic parameters (heart rate or blood pressure). Consider the use of ranolazine when beta-blockers, calcium channel blockers and nitrates are not adequately effective or are not tolerated (*Fihn, 2012 [Guideline]*). Ranolazine is not a first-line drug and should be used in conjunction with a cardiologist.

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21b. Nutritional Supplement Therapy

The American Heart Association (*Gibbons, 2003 [Guideline]*) recommends inclusion of omega-3 fatty acids in patients with stable coronary artery disease because of evidence from randomized controlled trials. The GISSI study (*GISSI-Prevenzione Investigators, 1999 [High Quality Evidence]*), using 850 mg of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) daily, showed a 20% overall mortality reduction, and a 45% reduction in sudden death. The JELIS trial used 1.8 grams EPA supplement daily and showed 19% relative reduction in major coronary events after mean follow-up of 4.6 years (*Yokoyama, 2007 [High Quality Evidence]*). Other studies showing benefit include the DART trial and the Lyon trial, and data have been recently summarized by meta-analysis indicating significant reduction in risk of sudden death and overall mortality (*Bucher, 2002 [Meta-analysis]*; *Kris-Etherton, 2002 [Low Quality Evidence]*; *de Lorgeril, 1999 [High Quality Evidence]*; *Burr, 1989 [High Quality Evidence]*).

The recommended daily amount of omega-3 fatty acids in patients with stable coronary artery disease is 1 gram of eicosapentaenoic acid (EPA) plus docosahexaenoic acid (DHA) by capsule supplement or by eating at least two 4-ounce servings per week of fatty fish. The amounts of omega-3 fatty acids in various foods are found in [Appendix D, "Omega-3 Fatty Acids."](#) To obtain the recommended daily amount of 1,000 mg EPA plus DHA per day, patients ought to be counseled in the proper way to interpret the supplement label. The goal is to consume 1,000 mg of EPA plus DHA, but not all omega-3 in a fish oil concentrate is EPA and DHA. The product label defines what constitutes a dose. Because there is variation in doses across products, it is necessary to calculate the EPA and DHA amount per dose, and consume the number of doses that together equate one gram (*Lee, 2008 [Low Quality Evidence]*). For example, if one serving size is two softgels, each serving containing 360 mg EPA plus 240 mg DHA, one would take two servings (four softgels) to attain the recommended dose of at least 1,000 mg of EPA plus DHA per day.

In addition to EPA and DHA supplements, patients with stable coronary artery disease should be encouraged to follow a diet rich in alpha-linolenic acid (ALA). See [Appendix D, "Omega-3 Fatty Acids."](#) According to published data, 1.5 gram-3 grams ALA per day appears to benefit the general population, and those at risk of heart disease also demonstrate benefit (based on level III evidence) (*Kris-Etherton, 2002 [Low Quality Evidence]*). Plant-based sources of omega-3 fatty acids would be ground flax seed, flax seed oil, walnuts, walnut oil, canola oil, soybeans and soybean oil. Fish meals can be difficult for patients to maintain, and there are issues of potential environmental contaminants including mercury, polychlorinated biphenyl (PCB), dioxin and others. Because of this, capsule supplements may be preferred, although there is no uniformity of EPA and DHA content or purity. Patients should consult their health clinicians or nutritionists regarding this issue.

Dietary and non-dietary intake of n-3 polyunsaturated fatty acids may reduce overall mortality, mortality due to myocardial infarction, and sudden death in patients with stable coronary artery disease (*DeFilippis, 2010 [Low Quality Evidence]*).

High doses of vitamin E supplement (greater than 400 IU/day) may increase or cause mortality and should be avoided (*Lee, 2005 [High Quality Evidence]*; *Miller, 2005 [Meta-analysis]*).

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21c. Use of ACE Inhibitors for Risk Reduction

Among patients with stable angina, ACE inhibitors are most beneficial to patients with left ventricular dysfunction post-myocardial infarction, persistent hypertension and diabetes (*HOPE Study Investigators, 2000 [High Quality Evidence]*). Patients with normal left ventricular function who also have hypertension, type II diabetes mellitus or chronic kidney disease should be on ACE inhibitors (*EUROPEAN Trial on Reduction of Cardiac Events with Perindopril in Stable Coronary Artery Disease Investigators 'EUROPA', 2003 [High Quality Evidence]*; *HOPE Study Investigators, 2000 [High Quality Evidence]*). If the patient cannot tolerate ACE inhibitors, a potential substitute would be angiotensin II receptor blockers (*Mann, 2008 [High Quality Evidence]*). Results of the PEACE trial showed no statistically significant benefit for patients with

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stable coronary artery disease with preserved left ventricular function who are receiving "current standard" therapy, including statins (*PEACE Trial Investigators, 2004 [High Quality Evidence]*).

A meta-analysis of five placebo randomized controlled trials involving different ACE inhibitors showed reduction in all-cause and cardiovascular mortality, as well as myocardial infarction, that were statistically significant. The degree of benefit needs to be assessed individually and may depend on patient characteristics (*Danchin, 2006 [Meta-analysis]*).

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21d. Does Patient Need Daily Antianginal Therapy?

The decision to initiate daily drug therapy for coronary artery disease is based upon the symptom complex of the patient in combination with findings from the history, physical examination, laboratory studies and prognostic testing (*ISIS-4, 1995 [High Quality Evidence]*; *Gorlin, 1992 [Low Quality Evidence]*; *Rutherford, 1992 [Low Quality Evidence]*; *SOLVD Investigators, 1991 [High Quality Evidence]*; *Shub, 1990 [Low Quality Evidence]*; *Frye, 1989 [Low Quality Evidence]*).

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21e. Prescribe Antianginal Therapy

Beta-Blocking Agents

Beta-blockers should be used in all status post-myocardial infarction patients, based on studies showing mortality reduction. They are also the preferred first-line therapy for reducing symptoms of angina in patients with stable coronary artery disease. Drugs with intrinsic sympathomimetic activity should be avoided. Abrupt withdrawal of all beta-blockers should be avoided (*Cucherat, 1997 [High Quality Evidence]*; *Shub, 1990 [Low Quality Evidence]*; *Frye, 1989 [Low Quality Evidence]*).

Long-Acting Nitrates

If beta-blockers cannot be prescribed as first-line therapy, nitrates are the preferred alternative first-line therapy because of efficacy, low cost and relatively few side effects. Tolerance to long-acting nitrates is an important clinical issue in some patients and can be avoided by appropriate daily nitrate-free intervals (*Cheitlin, 1999 [Low Quality Evidence]*; *Parker, 1998 [Low Quality Evidence]*; *Frye, 1989 [Low Quality Evidence]*).

Adverse Interactions between Nitrates and Phosphodiesterase-5 Inhibitors

Patients with stable coronary artery disease should be advised that due to potentially life-threatening hypotension, phosphodiesterase-5 inhibitors (such as sildenafil, vardenafil and tadalafil) are contraindicated if they have used nitrates within the last 24 hours.

In any patient evaluated for acute coronary insufficiency, nitrates must also be avoided if there is a history or phosphodiesterase-5 inhibitor use in the previous 24-48 hours (avoid nitrates for 24 hours after sildenafil and vardenafil; avoid nitrates for 48 hours after tadalafil). All other interventions, including all non-nitrate antianginal medications may be used for these patients.

Calcium Channel Blockers

For patients who are unable to take beta-blockers or long-acting nitrates, the use of calcium channel blockers has been shown to be clinically effective in decreasing symptoms of angina. Calcium channel blockers have not been proven to reduce mortality. Because beta-blockers have reduced mortality in the post-myocardial infarction period, they are the preferred agent for patients with stable coronary artery disease (*Shub, 1990 [Low Quality Evidence]*). Dihydropyridines as monotherapy may exacerbate angina during dose initiation or titration.

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21g. Prescribe Additional Therapy

Additional therapy may be necessary in selected patients, but it increases side effects and cost. A combination of beta-blockers and long-acting nitrates is preferred because of cost, efficacy and reduced potential for adverse side effects (*Rutherford, 1992 [Low Quality Evidence]; Akhras, 1991 [High Quality Evidence]; Tolins, 1984 [High Quality Evidence]*). The following factors should be considered when beta-blockers and calcium channel blockers are combined (*Strauss, 1988 [Low Quality Evidence]*):

- This combination may not be better than either agent used alone in maximum tolerated doses.
- If angina persists at the maximum optimal dose of beta-blocker, addition of a calcium channel blocker is likely to reduce angina and improve exercise performance.
- With left ventricular dysfunction, sinus bradycardia, or conduction disturbances, combination treatment with non-dihydropyridine calcium channel blockers and beta-blockers should be avoided or initiated with caution. In patients with conduction system disease, dihydropyridine calcium channel blocker can be considered.
- Monitor peripheral edema if the combination of dihydropyridines and long-acting oral nitrates are needed for symptom control because both are potent vasodilators.
- If side effects prohibit increased doses but symptoms persist, selected patients may need low doses of multiple drug therapy.

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21h. Additional Therapy Effective?

If after several attempts at adjusting the medications, a therapeutic combination is not achieved for the patient, a cardiology consultation or referral may be appropriate.

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The Aims and Measures section is intended to provide protocol users with a menu of measures for multiple purposes that may include the following:

- population health improvement measures,
- quality improvement measures for delivery systems,
- measures from regulatory organizations such as Joint Commission,
- measures that are currently required for public reporting,
- measures that are part of Center for Medicare Services Physician Quality Reporting initiative, and
- other measures from local and national organizations aimed at measuring population health and improvement of care delivery.

This section provides resources, strategies and measurement for use in closing the gap between current clinical practice and the recommendations set forth in the guideline.

The subdivisions of this section are:

- Aims and Measures
- Implementation Recommendations
- Implementation Tools and Resources
- Implementation Tools and Resources Table

Aims and Measures

1. Increase the percentage of patients age 18 years and older with a diagnosis of stable coronary artery disease (SCAD) who are prescribed aspirin and anti-atherosclerotic medications. (*Annotations #21a, 21c*)

Measure for accomplishing this aim:

- a. Percentage of patients with stable coronary artery disease who are prescribed aspirin and anti-atherosclerotic medications.
2. Increase the percentage of patients age 18 years and older with a diagnosis of stable coronary artery disease who understand the self-management of their condition. (*Annotations #2, 21a*)

Measure for accomplishing this aim:

- a. Percentage of patients with stable coronary artery disease who have demonstrated an understanding of how to respond in an acute cardiac event by "teaching back" as to how they would respond in the case of acute cardiac event including the following:
 - Proper use of nitroglycerin
 - Consistent use of aspirin (unless contraindicated), or consistent use of clopidogrel as directed
 - When to call 911
3. Increase the percentage of patients age 18 years and older with a diagnosis of stable coronary artery disease who receive education and an intervention for modifiable risk factors. (*Annotation #5*)

Measures for accomplishing this aim:

- a. Percentage of patients who smoke with documentation in the medical record that advice to quit was provided and/or help to quit was provided.
- b. Percentage of patients with cardiovascular disease who received an annual influenza vaccination.
- c. Percentage of patients with documentation in the medical record of receiving a pneumonia vaccination according to the CDC recommendations.
- d. Percentage of patients with documentation in the medical record of physical activity goal and when the goal was met.
- e. Percentage of patients who were screened for depression using the PHQ-9 (see the ICSI Major Depression in Adults in Primary Care guideline).
- f. Percentage of patients with documentation in the medical record that an LDL was obtained within the last 12 months, with an LDL less than 100 mg/dL. Consider < 70 mg/dL for high-risk patients.
- g. Percentage of patients with a documented blood pressure in the medical record of 140/90 mmHg or less.
- h. Percentage of patients with diabetes with a documented HbA1c of < 7.0% or meeting the patient's HbA1c goal.

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Aims and Measures

4. Increase the use of angiotensin-converting enzyme (ACE) inhibitors or angiotensin II receptor blockers (ARBs) in patients with stable coronary artery disease with systolic CHF (ejection fraction less than or equal to 40%), including those patients with a comorbidity diagnosis of chronic kidney disease and/or diabetes mellitus. (*Annotation #21c*)

Measures for accomplishing this aim:

- a. Percentage of patients with a diagnosis of SCAD with systolic CHF (ejection fraction less than or equal to 40%) who are prescribed an ACE inhibitor or ARB.
 - b. Percentage of patients with a diagnosis of stable coronary artery disease and diabetes who are prescribed an ACE inhibitor or ARB.
 - c. Percentage of patients with a diagnosis of stable coronary artery disease and hypertension who are prescribed an ACE inhibitor or ARB.
5. Increase appropriate clinical risk assessment and stress imaging for stable coronary artery disease patients to determine risk stratification prior to decisions on medical therapy and revascularization. (*Annotation #7*)

Measure for accomplishing this aim:

- a. Percentage of patients with documentation in the medical record of prognostic assessment preceding or following a course of pharmacologic therapy.

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Measurement Specifications

Measurement #1a

Percentage of patients with stable coronary artery disease who are prescribed aspirin anti-atherosclerotic medications.

Population Definition

All patients age 18 and older with stable coronary artery disease diagnosis.

Data of Interest

$$\frac{\text{\# of patients prescribed aspirin anti-atherosclerotic medications}}{\text{\# of patients with stable coronary artery disease}}$$

Numerator/ Denominator Definitions

Numerator: Number of stable coronary artery disease patients who are prescribed aspirin anti-atherosclerotic medications.

Contraindications to aspirin use are not defined in the guideline (Annotation #12), but left to the clinician's discretion. Some commonly found contraindications are allergy to the drug and history of bleeding ulcer or gastric hemorrhage. When contraindications are present, they need to be noted in the patient's record.

Denominator: Number of stable coronary artery disease patients. Patients with documented contraindications to aspirin should be excluded from the denominator of this measure.

Method/Source of Data Collection

Review medical records for all patients who have stable coronary artery disease diagnosis and would be eligible for aspirin prescription. Patients with contraindications to aspirin should be excluded from review. Review medical records to determine whether aspirin was prescribed unless contraindicated.

Time Frame Pertaining to Data Collection

Data may be collected monthly.

Notes

This is a process measure, and improvement is noted as an increase in the rate.

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Aims and Measures

Measurement #2a

Percentage of patients with stable coronary artery disease who have demonstrated an understanding of how to respond in an acute cardiac event by "teaching back" as to how they would respond in the case of acute cardiac event, including the following:

- Proper use of nitroglycerin
- Consistent use of aspirin (unless contraindicated), or consistent use of clopidogrel as directed
- When to call 911

Population Definition

All patients age 18 years and older with stable coronary artery disease diagnosis.

Data of Interest

$$\frac{\text{\# of patients who have demonstrated an understanding of how to respond in an acute cardiac event}}{\text{\# of patients with stable coronary artery disease}}$$

Numerator/ Denominator Definitions

Numerator: Number of stable coronary artery disease patients who have demonstrated an understanding of how to respond in an acute cardiac event by "teaching back" as to how they would respond in the case of acute cardiac event, including the following:

- Proper use of nitroglycerin
- Consistent use of aspirin (unless contraindicated), or consistent use of clopidogrel as directed
- When to call 911

Denominator: Number of stable coronary artery disease patients.

Method/Source of Data Collection

Review medical records for all patients who have stable coronary artery disease diagnosis. Review medical records to determine whether they demonstrated an understanding of how to respond in an acute cardiac event by "teaching back" as to how they would respond in the case of acute cardiac event, including the following:

- Proper use of nitroglycerin
- Consistent use of aspirin (unless contraindicated), or consistent use of clopidogrel as directed
- When to call 911

Time Frame Pertaining to Data Collection

Data may be collected monthly.

Notes

This is a process measure, and improvement is noted as an increase in the rate.

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Aims and Measures

Measurement #3a

Percentage of patients who smoke with documentation in the medical record that advice to quit was provided and/or help to quit was provided.

Population Definition

All patients age 18 years and older with stable coronary artery disease diagnosis and smokers.

Data of Interest

$$\frac{\text{\# of patients who received quit smoking advice}}{\text{\# of patients with stable coronary artery disease and smokers}}$$

Numerator/ Denominator Definitions

Numerator: Number of stable coronary artery disease patients and smokers who received advice to quit and/or help to quit was provided.

Denominator: Number of stable coronary artery disease patients and smokers.

Method/Source of Data Collection

Review medical records for all patients who have stable coronary artery disease diagnosis. Review medical records to determine whether they were smokers and received advice to quit and/or help to quit was provided.

Time Frame Pertaining to Data Collection

Data may be collected monthly.

Notes

This is a process measure, and improvement is noted as an increase in the rate.

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Aims and Measures

Measurement #3b

Percentage of patients with cardiovascular disease who received an annual influenza vaccination.

Population Definition

All patients age 18 years and older with stable coronary artery disease diagnosis.

Data of Interest

$$\frac{\text{\# of patients with cardiovascular disease who received an annual influenza vaccination}}{\text{\# of patients with stable coronary artery disease}}$$

Numerator/ Denominator Definitions

Numerator: Number of patients with cardiovascular disease who received an annual influenza vaccination.

Denominator: Number of stable coronary artery disease patients.

Method/Source of Data Collection

Review medical records for all patients who have stable coronary artery disease diagnosis. Review medical records to determine whether they received influenza vaccination within last year.

Time Frame Pertaining to Data Collection

Data may be collected monthly.

Notes

This is a process measure, and improvement is noted as an increase in the rate.

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Aims and Measures

Measurement #3c

Percentage of patients with documentation in the medical record of receiving a pneumonia vaccination according to the CDC recommendations.

Population Definition

All patients age 18 years and older with stable coronary artery disease diagnosis.

Data of Interest

$$\frac{\# \text{ of patients with documented pneumonia vaccination}}{\# \text{ of patients with stable coronary artery disease}}$$

Numerator/ Denominator Definitions

Numerator: Number of stable coronary artery disease patients who had documented pneumonia vaccination.

Denominator: Number of stable coronary artery disease patients.

Method/Source of Data Collection

Review medical records for all patients who have stable coronary artery disease diagnosis. Review medical records to determine whether they had documented pneumonia vaccination.

Time Frame Pertaining to Data Collection

Data may be collected monthly.

Notes

This is a process measure, and improvement is noted as an increase in the rate.

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Aims and Measures

Measurement #3d

Percentage of patients with documentation in the medical record of physical activity goal and when the goal was met.

Population Definition

All patients age 18 years and older with stable coronary artery disease diagnosis.

Data of Interest

$$\frac{\text{\# of patients with physical activity goal and when the goal was met in the record}}{\text{\# of patients with stable coronary artery disease}}$$

Numerator/ Denominator Definitions

Numerator: Number of stable coronary artery disease patients who had documented physical activity goal and when the goal was met.

Denominator: Number of stable coronary artery disease patients.

Method/Source of Data Collection

Review medical records for all patients who have stable coronary artery disease diagnosis. Review medical records to determine whether they had documented physical activity goal and when goal was met.

Time Frame Pertaining to Data Collection

Data may be collected monthly.

Notes

This is a process measure, and improvement is noted as an increase in the rate.

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Aims and Measures

Measurement #3e

Percentage of patients who were screened for depression using the PHQ-9 (see the ICSI Major Depression in Adults in Primary Care guideline).

Population Definition

All patients age 18 years and older with stable coronary artery disease diagnosis.

Data of Interest

$$\frac{\text{\# of patients with PHQ-9}}{\text{\# of patients with stable coronary artery disease}}$$

Numerator/ Denominator Definitions

Numerator: Number of stable coronary artery disease patients who were screened for depression using the PHQ-9 tool. For more information on PHQ-9 tool, see ICSI Major Depression in Adults in Primary Care guideline.

Denominator: Number of stable coronary artery disease patients.

Method/Source of Data Collection

Review medical records for all patients who have stable coronary artery disease diagnosis. Review medical records to determine whether they had PHQ-9 done.

Time Frame Pertaining to Data Collection

Data may be collected semi-annually.

Notes

This is a process measure, and improvement is noted as an increase in the rate.

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Aims and Measures

Measurement #3f

Percentage of patients with documentation in the medical record that an LDL was obtained within the last 12 months with an LDL less than 100 mg/dL. Consider < 70 mg/dL for high risk patient.

Population Definition

All patients age 18 years and older with stable coronary artery disease diagnosis.

Data of Interest

$$\frac{\text{\# of patients with LDL screening in the last 12 months and LDL was less than 100 mg/dL}}{\text{\# of patients with stable coronary artery disease}}$$

Numerator/ Denominator Definitions

Numerator: Number of stable coronary artery disease patients who had LDL screening within the last 12 months and LDL was less than 100 mg/dL.

Denominator: Number of stable coronary artery disease patients.

Method/Source of Data Collection

Review medical records for all patients who have stable coronary artery disease diagnosis. Review medical records to determine whether they had LDL screening done within the last 12 months and it was less than 100 mg/dL.

Time Frame Pertaining to Data Collection

Data may be collected annually.

Notes

This is a process measure, and improvement is noted as an increase in the rate.

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Aims and Measures

Measurement #3g

Percentage of patients with a documented blood pressure in the medical record of 140/90 mmHg or less.

Population Definition

All patients age 18 years and older with stable coronary artery disease diagnosis.

Data of Interest

$$\frac{\text{\# of patients with blood pressure of 140/90 mmHg or less}}{\text{\# of patients with stable coronary artery disease}}$$

Numerator/ Denominator Definitions

Numerator: Number of stable coronary artery disease patients who had blood pressure of 140/90 mmHg or less.

Denominator: Number of stable coronary artery disease patients.

Method/Source of Data Collection

Review medical records for all patients who have stable coronary artery disease diagnosis. Review medical records to determine whether they had blood pressure of 140/90 mmHg or less within the last 12 months.

Time Frame Pertaining to Data Collection

Data may be collected annually.

Notes

This is a process measure, and improvement is noted as an increase in the rate.

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Aims and Measures

Measurement #3h

Percentage of patients with diabetes with a documented HbA1c of < 7.0% or meeting the patient's individualized HbA1c goal.

Population Definition

All patients age 18 years and older with stable coronary artery disease diagnosis and diabetes.

Data of Interest

$$\frac{\# \text{ of patients with HbA1c of } < 7.0\% \text{ or at their individualized goal}}{\# \text{ of patients with stable coronary artery disease and diabetes}}$$

Numerator/ Denominator Definitions

Numerator: Number of stable coronary artery disease patients who had a documented HbA1c of < 7% or who met their individualized goal.

Denominator: Number of stable coronary artery disease patients with diabetes.

Method/Source of Data Collection

Review medical records for all patients who have stable coronary artery disease diagnosis. Review medical records to determine whether they had a documented HbA1c goal that was met or an HbA1c < 7%.

Time Frame Pertaining to Data Collection

Data may be collected monthly.

Notes

This is a process measure, and improvement is noted as an increase in the rate.

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Aims and Measures

Measurement #4a

Percentage of patients with diagnosis of SCAD with systolic CHF (ejection fraction less than or equal to 40%) who are prescribed an ACE inhibitor or ARB.

Population Definition

All patients age 18 years and older with stable coronary artery disease diagnosis.

Data of Interest

$$\frac{\text{\# of patients with prescription for an ACE inhibitor or ARB}}{\text{\# of patients with stable coronary artery disease with systolic CHF (ejection fraction less than or equal to 40%)}}$$

Numerator/ Denominator Definitions

Numerator: Number of patients who had a prescription for an ACE inhibitor or ARB.

Denominator: Number of stable coronary artery disease patients with systolic CHF (ejection fraction less than or equal to 40%).

Method/Source of Data Collection

Review medical records for all patients who have stable coronary artery disease diagnosis with systolic CHF (ejection fraction less than or equal to 40%). Review medical records to determine whether they had a prescription for an ACE inhibitor or ARB.

Time Frame Pertaining to Data Collection

Data may be collected annually.

Notes

This is a process measure, and improvement is noted as an increase in the rate.

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Aims and Measures

Measurement #4b

Percentage of patients with a diagnosis of stable coronary artery disease and diabetes who are prescribed an ACE inhibitor or ARB.

Population Definition

All patients age 18 years and older with stable coronary artery disease diagnosis and chronic kidney disease.

Data of Interest

$$\frac{\text{\# of patients with a prescription for an ACE inhibitor or ARB}}{\text{\# of patients with stable coronary artery disease and chronic kidney disease}}$$

Numerator/ Denominator Definitions

Numerator: Number of patients who had a prescription for an ACE inhibitor or ARB.

Denominator: Number of stable coronary artery disease patients and chronic kidney disease.

Method/Source of Data Collection

Review medical records for all patients who have stable coronary artery disease diagnosis and chronic kidney disease. Review medical records to determine whether they had a prescription for an ACE inhibitor or ARB.

Time Frame Pertaining to Data Collection

Data may be collected annually.

Notes

This is a process measure, and improvement is noted as an increase in the rate.

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Aims and Measures

Measurement #4c

Percentage of patients with a diagnosis of stable coronary artery disease and hypertension who are prescribed an ACE inhibitor or ARB.

Population Definition

All patients age 18 years and older with stable coronary artery disease diagnosis, and hypertension.

Data of Interest

$$\frac{\text{\# of patients with prescription for an ACE inhibitor or ARB}}{\text{\# of patients with stable coronary artery disease and hypertension}}$$

Numerator/ Denominator Definitions

Numerator: Number of patients who had a prescription for an ACE inhibitor or ARB.

Denominator: Number of stable coronary artery disease patients and hypertension.

Method/Source of Data Collection

Review medical records for all patients who have stable coronary artery disease diagnosis and hypertension. Review medical records to determine whether they had a prescription for an ACE inhibitor or ARB.

Time Frame Pertaining to Data Collection

Data may be collected annually.

Notes

This is a process measure, and improvement is noted as an increase in the rate.

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Aims and Measures

Measurement #5a

Percentage of patients with documentation in the medical record of prognostic assessment preceding or following a course of pharmacologic therapy.

Population Definition

All patients age 18 years and older with stable coronary artery disease diagnosis.

Data of Interest

$$\frac{\# \text{ of patients with prognostic assessment preceding or following a course of pharmacologic therapy}}{\# \text{ of patients with stable coronary artery disease}}$$

Numerator/ Denominator Definitions

Numerator: Number of patients who had prognostic assessment preceding or following a course of pharmacologic therapy.

Denominator: Number of stable coronary artery disease patients.

Method/Source of Data Collection

Review medical records for all patients who have stable coronary artery disease diagnosis. Review medical records to determine whether they had prognostic testing preceding or following a course of pharmacologic therapy.

Time Frame Pertaining to Data Collection

Data may be collected quarterly.

Notes

This is a process measure, and improvement is noted as an increase in the rate.

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Implementation Recommendations

Prior to implementation, it is important to consider current organizational infrastructure that address the following:

- System and process design
- Training and education
- Culture and the need to shift values, beliefs and behaviors of the organization.

The following system changes were identified by the guideline work group as key strategies for health care systems to incorporate in support of the implementation of this guideline:

- Develop systems for providing patient education around:
 - Proper use of nitroglycerin
 - Consistent use of aspirin (unless contraindicated) or consistent use of clopidogrel as directed
 - When to call 911

Education should also provide for patient to "teach back" in order to demonstrate their understanding of what they should do in an acute cardiac event.

- Develop/provide patients education materials around use of aspirin (unless contraindicated) and interventions around modifiable risk factors.
- Provide patient education around the use and benefits of angiotensin-converting enzymes (ACE inhibitors) and/or angiotensin II receptor blockers (ARBs).

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Implementation Tools and Resources

Criteria for Selecting Resources

The following tools and resources specific to the topic of the guideline were selected by the work group. Each item was reviewed thoroughly by at least one work group member. It is expected that users of these tools will establish the proper copyright prior to their use. The types of criteria the work group used are:

- The content supports the clinical and the implementation recommendations.
- Where possible, the content is supported by evidence-based research.
- The author, source and revision dates for the content are included where possible.
- The content is clear about potential biases and when appropriate conflicts of interests and/or disclaimers are noted where appropriate.

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Implementation Tools and Resources Table

Author/Organization	Title/Description	Audience	Web sites/Order Information
AMA Foundation	Health information translation: provides a number of medical conditions translated in a variety of languages.	Patients and Families; Health Care Professionals	http://www.healthinfotranslations.com
American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR)	The American Association of Cardiovascular and Pulmonary Rehabilitation provides current, cutting-edge, health care information, education and legislation supporting optimal care of cardiac and pulmonary patients.	Health Professionals working in the care of cardiac and pulmonary patients	http://www.aacvpr.org
American College of Cardiology	The American College of Cardiology is a trusted source of up-to-date clinical cardiovascular and health policy information.	Health Care Professionals	http://www.acc.org/media/media.htm
American Diabetes Association	The American Diabetes Association is leading the fight against the deadly consequences of diabetes and fighting for those affected by diabetes. The association funds research to prevent, cure and manage diabetes; delivers services to hundreds of communities; provides objective and credible information; and gives voice to those denied their rights because of diabetes.	Patients and Families	http://www.diabetes.org
American Heart Association	The American Heart Association is a national voluntary health agency whose mission is "building healthier lives, free of cardiovascular diseases and stroke."	Patients and Families	http://my.americanheart.org/portal/professional/ourmission
Call It Quits Referral Program	Call It Quits Referral Program (Providers) – The Call it Quits Referral Program (formerly the MN Clinic Fax Referral Program) enables health care providers to use a single form and fax number to refer patients who use tobacco to quitline support. All Minnesota residents – whether covered by a health plan or not – have access to free support to quit.	Health Care Professionals	http://www.preventionminnesota.com/doing_page.cfm?oid=7234
National Heart, Lung and Blood Institute	The institute plans, conducts, fosters and supports an integrated and coordinated program of basic research, clinical investigations and trials, observational studies, and demonstration and education projects.	Patients and Families; Health Care Professionals	http://www.nhlbi.nih.gov/

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Resources Table

Author/Organization	Title/Description	Audience	Web sites/Order Information
National Institutes of Health	Helping to lead the way toward important medical discoveries that improve people's health and save lives, NIH scientists investigate ways to prevent disease as well as the causes, treatments and even cures for common and rare diseases.	Patients and Families; Health Care Professionals	http://www.nih.gov/
National Tobacco Quitline	This national service for individuals attempting to quit tobacco use is offered across the United States.	Counseling for individuals attempting to cease tobacco use	1-800-QUIT-NOW (1-800-784-8669) http://www.smokefree.gov
Preventive Cardiology Nurses Association (PCNA)	This professional association provides educational tools for both health care providers and patients and all areas of cardiovascular care.	Cardiovascular Nursing Professionals and Individuals with all types of heart disease	http://www.pcna.net
QUITPLAN	QUITPLAN Services is a free, professional counseling service that has helped over 19,000 Minnesotans successfully quit tobacco. The program is funded by a portion of the Minnesota Tobacco Settlement.	Patients and Families	https://www.quitplan.com
Society for Medical Decision Making	Society for Medical Decision Making	Health Care Professionals	http://www.smdm.org
U.S. Department of Health and Human Service	Active Your Way	Patients and Families	http://www.health.gov/paguidelines/adultguide/default.aspx
U.S. Food and Drug Administration	What You Need to Know About Mercury in Fish and Shellfish (trifold brochure)	Health Care Professionals	http://www.fda.gov/Food/FoodborneIllnessContaminants/BuyStoreServeSafeFood/ucm110591.htm
WomenHeart	National coalition for women with heart disease to improve the health and quality of life of women living with or at risk of heart disease, and to advocate, through legislation, for their benefit.	Women with Heart Disease	http://www.womenheart.org

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- References
- Appendices

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Links are provided for those new references added to this edition (author name is highlighted in blue).

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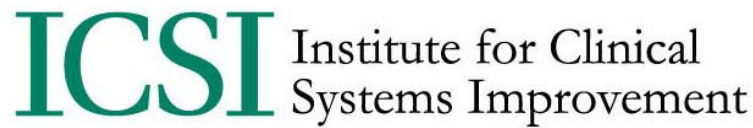
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Appendix A – ICSI Shared Decision-Making Model



The technical aspects of Shared Decision-Making are widely discussed and understood.

- **Decisional conflict** occurs when a patient is presented with options where no single option satisfies all the patient's objectives, where there is an inherent difficulty in making a decision, or where external influencers act to make the choice more difficult.
- **Decision support** clarifies the decision that needs to be made, clarifies the patient's values and preferences, provides facts and probabilities, guides the deliberation and communication and monitors the progress.
- **Decision aids** are evidence-based tools that outline the benefits, harms, probabilities and scientific uncertainties of specific health care options available to the patient.

However, before decision support and decision aids can be most advantageously utilized, a Collaborative Conversation™ should be undertaken between the provider and the patient to provide a supportive framework for Shared Decision-Making.

Collaborative Conversation™

A collaborative approach toward decision-making is a fundamental tenet of Shared Decision-Making (SDM). The Collaborative Conversation™ is an inter-professional approach that nurtures relationships, enhances patients' knowledge, skills and confidence as vital participants in their health, and encourages them to manage their health care.

Within a Collaborative Conversation™, the perspective is that both the patient and the provider play key roles in the decision-making process. The patient knows which course of action is most consistent with his/her values and preferences, and the provider contributes knowledge of medical evidence and best practices. Use of Collaborative Conversation™ elements and tools is even more necessary to support patient, care provider and team relationships when patients and families are dealing with high stakes or highly charged issues, such as diagnosis of a life-limiting illness.

The overall framework for the Collaborative Conversation™ approach is to create an environment in which the patient, family and care team work collaboratively to reach and carry out a decision that is consistent with the patient's values and preferences. A rote script or a completed form or checklist does not constitute this approach. Rather it is a set of skills employed appropriately for the specific situation. These skills need to be used artfully to address all aspects involved in making a decision: cognitive, affective, social and spiritual.

Key communication skills help build the Collaborative Conversation™ approach. These skills include many elements, but in this appendix only the questioning skills will be described. (For complete instruction, see O'Connor, Jacobsen "Decisional Conflict: Supporting People Experiencing Uncertainty about Options Affecting Their Health" [2007], and Bunn H, O'Connor AM, Jacobsen MJ "Analyzing decision support and related communication" [1998, 2003].)

1. Listening skills:

Encourage patient to talk by providing prompts to continue such as "go on, and then?, uh huh," or by repeating the last thing a person said, "It's confusing."

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Appendix A – ICSI Shared Decision-Making Model

Paraphrase content of messages shared by patient to promote exploration, clarify content and to communicate that the person’s unique perspective has been heard. The provider should use his/her own words rather than just parroting what he/she heard.

Reflection of feelings usually can be done effectively once trust has been established. Until the provider feels that trust has been established, short reflections at the same level of intensity expressed by the patient without omitting any of the message’s meaning are appropriate. Reflection in this manner communicates that the provider understands the patient’s feelings and may work as a catalyst for further problem solving. For example, the provider identifies what the person is feeling and responds back in his/her own words like this: *“So, you’re unsure which choice is the best for you.”*

Summarize the person’s key comments and reflect them back to the patient. The provider should condense several key comments made by the patient and provide a summary of the situation. This assists the patient in gaining a broader understanding of the situations rather than getting mired down in the details. The most effective times to do this are midway through and at the end of the conversation. An example of this is, *“You and your family have read the information together, discussed the pros and cons, but are having a hard time making a decision because of the risks.”*

Perception checks ensure that the provider accurately understands a patient or family member, and may be used as a summary or reflection. They are used to verify that the provider is interpreting the message correctly. The provider can say *“So you are saying that you’re not ready to make a decision at this time. Am I understanding you correctly?”*

2. Questioning Skills

Open and closed questions are both used, with the emphasis on open questions. Open questions ask for clarification or elaboration and cannot have a yes or no answer. An example would be *“What else would influence you to choose this?”* Closed questions are appropriate if specific information is required such as *“Does your daughter support your decision?”*

Other skills such as summarizing, paraphrasing and reflection of feeling can be used in the questioning process so that the patient doesn’t feel pressured by questions.

Verbal tracking, referring back to a topic the patient mentioned earlier, is an important foundational skill (Ivey & Bradford-Ivey). An example of this is the provider saying, *“You mentioned earlier...”*

3. Information-Giving Skills

Providing information and **providing feedback** are two methods of information giving. The distinction between providing information and giving advice is important. Information giving allows a provider to supplement the patient’s knowledge and helps to keep the conversation patient centered. Giving advice, on the other hand, takes the attention away from the patient’s unique goals and values, and places it on those of the provider.

Providing information can be sharing facts or responding to questions. An example is *“If we look at the evidence, the risk is...”* Providing feedback gives the patient the provider’s view of the patient’s reaction. For instance, the provider can say, *“You seem to understand the facts and value your daughter’s advice.”*

Additional Communication Components

Other elements that can impact the effectiveness of a Collaborative Conversation™ include:

- Eye contact
- Body language consistent with message
- Respect

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Appendix A – ICSI Shared Decision-Making Model

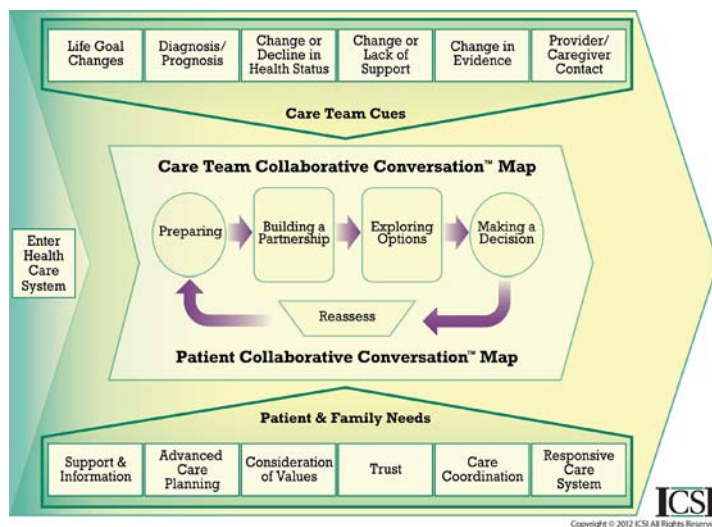
- Empathy
- Partnerships

Self-examination by the provider involved in the Collaborative Conversation™ can be instructive. Some questions to ask oneself include:

- Do I have a clear understanding of the likely outcomes?
- Do I fully understand the patient’s values?
- Have I framed the options in comprehensible ways?
- Have I helped the decision-makers recognize that preferences may change over time?
- Am I willing and able to assist the patient in reaching a decision based on his/her values, even when his/her values and ultimate decision may differ from my values and decisions in similar circumstances?

When to Initiate a Collaborative Conversation™

A Collaborative Conversation™ can support decisions that vary widely in complexity. It can range from a straightforward discussion concerning routine immunizations to the morass of navigating care for a life-limiting illness. Table 1 represents one health care event. This event can be simple like a 12 year-old coming to the clinic for routine immunizations, or something much more complex like an individual receiving a diagnosis of congestive heart failure. In either case, the event is the catalyst that starts the process represented in this table. There are cues for providers and patient needs that exert influence on this process. They are described below. The heart of the process is the Collaborative Conversation™. The time the patient spends within this health care event will vary according to the decision complexity and the patient’s readiness to make a decision.



Regardless of the decision complexity there are cues applicable to all situations that indicate an opportune time for a Collaborative Conversation™. These cues can occur singularly or in conjunction with other cues.

Cues for the Care Team to Initiate a Collaborative Conversation™

- **Life goal changes:** Patient’s priorities change related to things the patient values such as activities, relationships, possessions, goals and hopes, or things that contribute to the patient’s emotional and spiritual well-being.

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Appendix A – ICSI Shared Decision-Making Model

- **Diagnosis/prognosis changes:** Additional diagnoses, improved or worsening prognosis.
- **Change or decline in health status:** Improving or worsening symptoms, change in performance status or psychological distress.
- **Change or lack of support:** Increase or decrease in caregiver support, change in caregiver, or caregiver status, change in financial standing, difference between patient and family wishes.
- **Change in medical evidence or interpretation of medical evidence:** Providers can clarify the change and help the patient understand its impact.
- **Provider/caregiver contact:** Each contact between the provider/caregiver and the patient presents an opportunity to reaffirm with the patient that his/her care plan and the care the patient is receiving are consistent with his/her values.

Patients and families have a role to play as decision-making partners, as well. The needs and influencers brought to the process by patients and families impact the decision-making process. These are described below.

Patient and Family Needs within a Collaborative Conversation™

- **Request for support and information:** Decisional conflict is indicated by, among other things, the patient verbalizing uncertainty or concern about undesired outcomes, expressing concern about choice consistency with personal values and/or exhibiting behavior such as wavering, delay, preoccupation, distress or tension. Generational and cultural influencers may act to inhibit the patient from actively participating in care discussions, often patients need to be given “permission” to participate as partners in making decisions about his/her care.

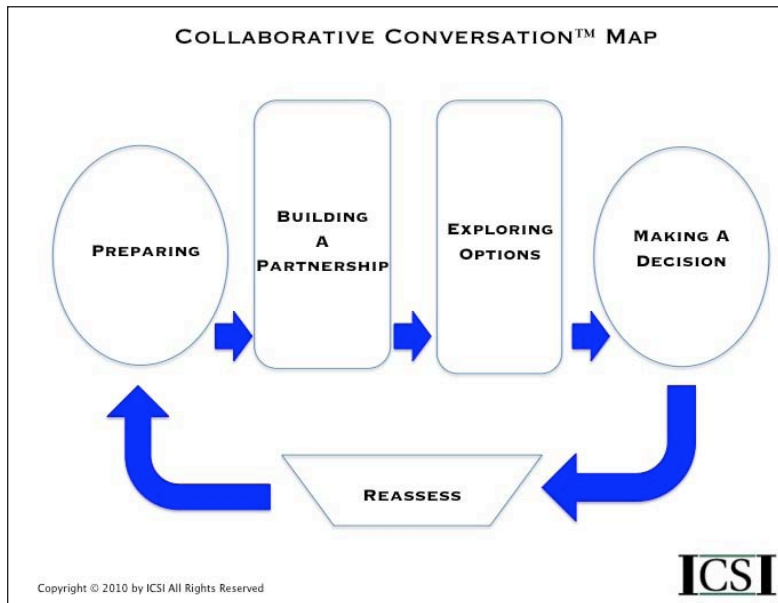
Support resources may include health care professionals, family, friends, support groups, clergy and social workers. When the patient expresses a need for information regarding options and his/her potential outcomes, the patient should understand the key facts about options, risks and benefits, and have realistic expectations. The method and pace with which this information is provided to the patient should be appropriate for the patient’s capacity at that moment.

- **Advance Care Planning:** With the diagnosis of a life-limiting illness, conversations around advance care planning open up. This is an opportune time to expand the scope of the conversation to other types of decisions that will need to be made as a consequence of the diagnosis.
- **Consideration of Values:** The personal importance a patient assigns potential outcomes must be respected. If the patient is unclear how to prioritize the preferences, value clarification can be achieved through a Collaborative Conversation™ and by the use of decision aids that detail the benefits and harms of potential outcomes in terms the patient can understand.
- **Trust:** The patient must feel confident that his/her preferences will be communicated and respected by all caregivers.
- **Care Coordination:** Should the patient require care coordination, this is an opportune time to discuss the other types of care-related decisions that need to be made. These decisions will most likely need to be revisited often. Furthermore, the care delivery system must be able to provide coordinated care throughout the continuum of care.
- **Responsive Care System:** The care system needs to support the components of patient- and family-centered care so the patient’s values and preferences are incorporated into the care he/she receives throughout the care continuum.

The Collaborative Conversation™ Map is the heart of this process. The Collaborative Conversation™ Map can be used as a stand-alone tool that is equally applicable to providers and patients as shown in Table 2.

Appendix A – ICSI Shared Decision-Making Model

Providers use the map as a clinical workflow. It helps get the Shared Decision-Making process initiated and provides navigation for the process. Care teams can use the Collaborative Conversation™ to document team best practices and to formalize a common lexicon. Organizations can build fields from the Collaborative Conversation™ Map in electronic medical records to encourage process normalization. Patients use the map to prepare for decision-making, to help guide them through the process and to share critical information with their loved ones.



Evaluating the Decision Quality

Adapted from O'Connor, Jacobsen "Decisional Conflict: Supporting People Experiencing Uncertainty about Options Affecting Their Health" [2007].

When the patient and family understand the key facts about the condition and his/her options, a good decision can be made. Additionally, the patient should have realistic expectations about the probable benefits and harms. A good indicator of the decision quality is whether or not the patient follows through with his/her chosen option. There may be implications of the decision on patient's emotional state such as regret or blame, and there may be utilization consequences.

Decision quality can be determined by the extent to which the patient's chosen option best matches his/her values and preferences as revealed through the Collaborative Conversation™ process.

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Appendix B – Comorbid Conditions

Medical Conditions

Condition	Recommended Treatment (and alternative)	Avoid
Systemic hypertension	Beta-blockers (calcium channel blockers)	
Migraine or vascular headaches	Beta-blockers (non-dihydropyridine calcium channel blockers)	
Asthma or COPD w/ bronchospasm	Non-dihydropyridine calcium channel blockers	Gradual titration with low initial doses may allow some patients to tolerate beta-blockers; careful monitoring is required.
Hyperthyroidism	Beta-blockers	
Raynaud's syndrome	Long-acting, slow-release calcium antagonists	Beta-blockers
Diabetes mellitus	ACE inhibitors, beta-blockers (particularly if prior myocardial infarction) or long-acting, slow-release calcium channel blockers Optimize medical therapy per the ICSI Management of Type 2 Diabetes Mellitus guideline	
Mild peripheral vascular disease	Beta-blockers or calcium channel blockers	
Severe peripheral vascular disease with rest ischemia	Calcium channel blockers	Beta-blockers

Cardiac Arrhythmias and Conduction Abnormalities

Sinus bradycardia	Dihydropyridine calcium channel blockers, long-acting, slow-release forms	Beta-blockers, non-hydropyridine calcium channel blockers
Sinus tachycardia (not due to heart failure)	Beta-blockers	
Supraventricular tachycardia	Non-hydropyridine calcium channel blockers or beta-blockers	
Atrioventricular block	Dihydropyridine calcium channel blockers, long-acting, slow-release forms	Beta-blockers, non-hydropyridine calcium channel blockers
Rapid atrial fibrillation (with digitalis)	Non-hydropyridine calcium channel blockers or beta-blockers	
Ventricular arrhythmias	Beta-blockers	

Special Conditions

Hypertrophic cardiomyopathy	Beta-blockers, non-dihydropyridine calcium channel blockers especially verapamil	Nitrates, dihydropyridine calcium channel blockers
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Appendix C – Grading of Angina Pectoris

Grading of Angina Pectoris by the New York Heart Association Classification System

Class I

Cardiac disease without resulting limitation of physical activity.

Class II

Slight limitation of physical activity – comfortable at rest, but ordinary physical activity results in fatigue, palpitation, dyspnea, or anginal pain.

Class III

Marked limitations in physical activity – comfortable at rest, but less than ordinary physical activity causes fatigue, palpitation, dyspnea, or anginal pain.

Class IV

Inability to carry on any physical activity without discomfort – or symptoms at rest.

Source: ACC/AHA/ACP-ASIM Chronic Stable Angina Guidelines

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Appendix D – Omega-3 Fatty Acids

Omega-3 fatty acids are found in fish oil and in some vegetable oils, nuts, seeds and soy. You can get omega-3 fatty acids from some foods or from over-the-counter and prescription supplements. Fish oil contains two important omega-3 fatty acids: **EPA** (eicosapentanoic acid) and **DHA** (docosahexanoic acid). Plant sources provide **ALA** (alpha-linolenic acid). Studies of EPA and DHA suggest that:

- doses of up to 1,000 mg per day reduce risk of heart attacks in high-risk patients; and
- doses of 2,000 mg-4,000 mg per day lower serum triglyceride levels, particularly for patients with triglyceride levels over 500 mg/L.

Tips for Getting More Omega-3 Fatty Acids

- Select fish from the chart below and eat at least 7 ounces per week. Prepare fish by grilling, baking, broiling or poaching.
- Omega-3 fatty acid supplements should be refrigerated and eaten with food. This will reduce the possibility of a mild fishy aftertaste.
- For those who cannot or will not consume fish-based products, an alternate source of omega-3 in the form of ALA from may be found in plant sources (level III evidence).
- Use vegetable oils that are high in omega-3 fatty acids. Examples are canola oil, soybean oil, flaxseed oil and walnut oil.
- Add walnuts or ground flaxseed to cereals, yogurt and salads. Whole flaxseeds will not work as well – they simply pass through the body undigested.
- Snack on edamame (steamed soybeans, sold fresh or frozen).

(Kris-Etherton, 2002 [Low Quality Evidence])

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Appendix D – Omega-3 Fatty Acids

Amounts of EPA+DHA in Fish and Fish Oils and the Amount of Fish Consumption Required to Provide ~1 g of EPA+DHA Per Day

	EPA+DHA Content, g/3-oz Serving Fish (Edible Portion) or g/g Oil	Amount Required to Provide ~1 g of EPA+DHA per Day, oz (Fish) or g (Oil)
Fish		
Tuna		
Light, canned in water, drained	0.26	12
White canned, in water, drained	0.73	4
Fresh	0.24-1.28	2.5-12
Sardines	0.98-1.70	2-3
Salmon		
Chum	0.68	4.5
Sockeye	1.05	2.5
Pink	1.09	2.5
Chinook	1.48	2
Atlantic, farmed	1.09-1.83	1.5-2.5
Atlantic, wild	0.9-1.56	2-3.5
Mackerel	0.34-1.57	2-8.5
Herring		
Pacific	1.81	1.5
Atlantic	1.71	2
Trout, rainbow		
Farmed	0.98	3
Wild	0.84	3.5
Halibut	0.4-1.0	3-7.5
Cod		
Pacific	0.24	12.5
Atlantic	0.13	23
Haddock	0.2	15
Catfish		
Farmed	0.15	20
Wild	0.2	15
Flounder/Sole	0.42	7
Oyster		
Pacific	1.17	2.5
Eastern	0.95	3
Farmed	0.37	8
Lobster	0.07-0.41	7.5-42.5
Crab, Alaskan King	0.35	8.5
Shrimp, mixed species	0.27	11
Clam	0.24	12.5
Scallop	0.17	17.5
Capsules		
Cod liver oil*	0.19	5
Standard fish body oil	0.30	3
Omega-3 fatty acid concentrate	0.50	2
Omacor (Pronova Biocare) †	0.85	1

Data from the USDA Nutrient Data Laboratory. The intakes of fish given above are very rough estimates because oil content can vary markedly (> 300%) with species, season, diet, and packaging and cooking methods.

* This intake of cod liver oil would provide approximately the Recommended Dietary Allowance (RDA) of vitamin A and twice the RDA for vitamin D.

† Not currently available in the United States.

Permission granted by Wolters Kluwer, Kris-Etherton PM, Harris WS, Appel LJ. Consumption, fish oil, omega-3 fatty acids, and cardiovascular disease. *Circulation* 2002;106:2747-57.

Appendix E – Alpha-Linolenic Acid Content of Selected Oils, Seeds and Nuts

Source of ALA	ALA	Amount needed by men to meet recommendation (1.6 g ALA/d)	Amount needed by women to meet recommendation (1.1 g ALA/d)
	<i>g/tbsp</i>	<i>tbsp</i>	<i>tbsp</i>
Pumpkin seeds	0.051	31.4	21.6
Olive oil	0.103	15.5	10.7
Walnuts, black	0.156	10.3	7.05
Soybean oil	1.231	1.3	0.89
Rapeseed oil	1.302	1.2	0.84
Walnut oil	1.414	1.1	0.78
Flaxseeds	2.350	0.68	0.47
Walnuts, English	2.574	0.62	0.43
Flaxseed oil	7.249	0.22	0.15

From reference 60.1 tbsp oil = 13.6 g; 1 tbsp seeds or nuts = 28.35 g.

Permission granted by the American Journal of Clinical Nutrition. Gabauer SK, Psota TL, Harris WS, Kris-Etherton PM. n-3 fatty acid dietary recommendations and food sources to achieve essentiality and cardiovascular benefits. *Am J Clin Nutr* 2006;83:1526S-35S.

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ICSI has long had a policy of transparency in declaring potential conflicting and competing interests of all individuals who participate in the development, revision and approval of ICSI guidelines and protocols.

In 2010, the ICSI Conflict of Interest Review Committee was established by the Board of Directors to review all disclosures and make recommendations to the board when steps should be taken to mitigate potential conflicts of interest, including recommendations regarding removal of work group members. This committee has adopted the Institute of Medicine Conflict of Interest standards as outlined in the report, *Clinical Practice Guidelines We Can Trust* (2011).

Where there are work group members with identified potential conflicts, these are disclosed and discussed at the initial work group meeting. These members are expected to recuse themselves from related discussions or authorship of related recommendations, as directed by the Conflict of Interest committee or requested by the work group.

The complete ICSI policy regarding Conflicts of Interest is available at <http://bit.ly/ICSICOI>.

Funding Source

The Institute for Clinical Systems Improvement provided the funding for this guideline revision. ICSI is a not-for-profit, quality improvement organization based in Bloomington, Minnesota. ICSI's work is funded by the annual dues of the member medical groups and five sponsoring health plans in Minnesota and Wisconsin. Individuals on the work group are not paid by ICSI but are supported by their medical group for this work.

ICSI facilitates and coordinates the guideline development and revision process. ICSI, member medical groups and sponsoring health plans review and provide feedback but do not have editorial control over the work group. All recommendations are based on the work group's independent evaluation of the evidence.

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All ICSI documents are available for review during the revision process by member medical groups and sponsors. In addition, all members commit to reviewing specific documents each year. This comprehensive review provides information to the work group for such issues as content update, improving clarity of recommendations, implementation suggestions and more. The specific reviewer comments and the work group responses are available to ICSI members at <http://bit.ly/SCAD>.

The ICSI Patient Advisory Council meets regularly to respond to any scientific document review requests put forth by ICSI facilitators and work groups. Patient advisors who serve on the council consistently share their experiences and perspectives in either a comprehensive or partial review of a document, and engaging in discussion and answering questions. In alignment with the Institute of Medicine's triple aims, ICSI and its member groups are committed to improving the patient experience when developing health care recommendations.

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Acknowledgements

ICSI Patient Advisory Council

The work group would like to acknowledge the work done by the ICSI Patient Advisory Council in reviewing the Stable Coronary Artery Disease guideline and thank them for their suggestions to improve the guideline.

Invited Reviewers

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ICSI Document Development and Revision Process

Overview

Since 1993, the Institute for Clinical Systems Improvement (ICSI) has developed more than 60 evidence-based health care documents that support best practices for the prevention, diagnosis, treatment or management of a given symptom, disease or condition for patients.

Audience and Intended Use

The information contained in this ICSI Health Care Guideline is intended primarily for health professionals and other expert audiences.

This ICSI Health Care Guideline should not be construed as medical advice or medical opinion related to any specific facts or circumstances. Patients and families are urged to consult a health care professional regarding their own situation and any specific medical questions they may have. In addition, they should seek assistance from a health care professional in interpreting this ICSI Health Care Guideline and applying it in their individual case.

This ICSI Health Care Guideline is designed to assist clinicians by providing an analytical framework for the evaluation and treatment of patients, and is not intended either to replace a clinician's judgment or to establish a protocol for all patients with a particular condition.

Document Development and Revision Process

The development process is based on a number of long-proven approaches and is continually being revised based on changing community standards. The ICSI staff, in consultation with the work group and a medical librarian, conduct a literature search to identify systematic reviews, randomized clinical trials, meta-analysis, other guidelines, regulatory statements and other pertinent literature. This literature is evaluated based on the GRADE methodology by work group members. When needed, an outside methodologist is consulted.

The work group uses this information to develop or revise clinical flows and algorithms, write recommendations, and identify gaps in the literature. The work group gives consideration to the importance of many issues as they develop the guideline. These considerations include the systems of care in our community and how resources vary, the balance between benefits and harms of interventions, patient and community values, the autonomy of clinicians and patients and more. All decisions made by the work group are done using a consensus process.

ICSI's medical group members and sponsors review each guideline as part of the revision process. They provide comment on the scientific content, recommendations, implementation strategies and barriers to implementation. This feedback is used by and responded to by the work group as part of their revision work. Final review and approval of the guideline is done by ICSI's Committee on Evidence-Based Practice. This committee is made up of practicing clinicians and nurses, drawn from ICSI member medical groups.

Implementation Recommendations and Measures

These are provided to assist medical groups and others to implement the recommendations in the guidelines. Where possible, implementation strategies are included that have been formally evaluated and tested. Measures are included that may be used for quality improvement as well as for outcome reporting. When available, regulatory or publicly reported measures are included.

Document Revision Cycle

Scientific documents are revised every 12-24 months as indicated by changes in clinical practice and literature. ICSI staff monitors major peer-reviewed journals every month for the guidelines for which they are responsible. Work group members are also asked to provide any pertinent literature through check-ins with the work group midcycle and annually to determine if there have been changes in the evidence significant enough to warrant document revision earlier than scheduled. This process complements the exhaustive literature search that is done on the subject prior to development of the first version of a guideline.

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