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## Low-Dose CT Screening Decreases Mortality in Heavy Smokers

### Clinical Question

What evidence supports screening smokers for lung cancer to reduce mortality?

### Bottom Line

In patients with a significant (greater than 50 pack-year) history of smoking, yearly screening for lung cancer using low-dose computed tomography (CT) will extend their lives. A significant proportion of screened patients will have a false-positive finding or a finding not related to lung cancer. As with many screening programs, there is likely a societal benefit to overall decreased mortality, although the likelihood of benefit to any individual will be small. (Level of Evidence = 1a)

### Synopsis

This systematic review focused on the effectiveness of CT screening of smokers for lung cancer, hoping that early detection would decrease lung cancer–related mortality as well as all-cause mortality. The investigators searched several databases, including the Cochrane Library, and reference lists from identified articles to find four English-language studies. These studies enrolled current or former smokers 50 years or older and compared annual CT screening with chest radiography or usual care. Only one of the four trials was deemed to be of good quality, and the conclusions from this review stem from this single study. It was also the largest study by a factor of 10. In this study of more than 53,000 patients screened yearly for three

years and then followed for an additional 3.5 years, there was a 20% decrease in lung cancer–related mortality and a 6.7% decrease in mortality by any cause (95% confidence interval, 1% to 27%). The other smaller studies did not find a benefit to screening. False-positive results were common. CT screening also frequently identified other clinically significant abnormalities that were not lung cancer in 7.5% of patients. These "screenomas" probably resulted in further testing, and the benefits or harms were not reported. The rate of overdiagnosis could not be calculated.

**Study design:** Systematic review

**Funding source:** Government

**Setting:** Other

**Reference:** *Humphrey LL, Deffebach M, Pappas M, et al. Screening for lung cancer with low-dose computed tomography: a systematic review to update the U.S. Preventive Services Task Force recommendation. Ann Intern Med. 2013;159(6):411-420.*

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## JNC 8 Report on Prevention, Evaluation, and Treatment of Hypertension

### Clinical Question

What are the best methods to prevent, detect, evaluate, and treat hypertension?

### Bottom Line

See the Synopsis section for a summary of the updated hypertension treatment recommendations from the Eighth Joint National Committee (JNC 8). (Level of Evidence = 1a)

### Synopsis

Recommendations for target goals: (1) For the general population, 60 years or older, the goal is to treat to a systolic blood pressure of less than 150 mm Hg and a diastolic blood pressure of less than 90 mm Hg. (2) For the ►

general population, younger than 60 years, the goal is to treat to a systolic blood pressure of less than 140 mm Hg and a diastolic blood pressure of less than 90 mm Hg. (3) In adults 18 years or older with chronic kidney disease—defined as an estimated or measured glomerular filtration rate less than 60 mL per minute per 1.73 m<sup>2</sup> in individuals younger than 70 years—and in patients at any age with albuminuria (> 30 mg of albumin per g of creatinine), treat to a systolic blood pressure of less than 140 mm Hg and a diastolic blood pressure of less than 90 mm Hg. (4) In adults 18 years or older with diabetes mellitus, treat to a systolic blood pressure of less than 140 mm Hg and a diastolic blood pressure of less than 90 mm Hg.

Recommendations for drug choice: (1) In the general nonblack population, including patients with diabetes, the appropriate initial choice is a thiazide diuretic (any type, including hydrochlorothiazide or chlorthalidone), calcium channel blocker, angiotensin-converting enzyme (ACE) inhibitor, or angiotensin receptor blocker (ARB). Initial treatment with a thiazide diuretic is most effective in improving heart failure outcomes. Beta blockers and alpha blockers are not recommended for initial treatment. (2) In the general black population, including those with diabetes, the appropriate initial choice is a thiazide diuretic or calcium channel blocker. (3) In adults 18 years or older with chronic kidney disease, the appropriate initial choice is an ACE inhibitor or an ARB. In black patients with chronic kidney disease without proteinuria, the initial choice is less clear and can be a thiazide diuretic, calcium channel blocker, ACE inhibitor, or ARB. (4) Do not use an ACE inhibitor and an ARB together.

**Study design:** Practice guideline

**Funding source:** Foundation

**Setting:** Various (guideline)

**Reference:** James PA, Oparil S, Carter BL, et al. 2014 Evidence-based guideline for the management of high blood pressure in adults: report from the panel members appointed to the Eighth Joint National Committee (JNC 8). *JAMA*. 2014;311(5):507-520.

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## No Benefit to Addition of Stenting for Treatment of Atherosclerotic Renal Artery Stenosis

### Clinical Question

Does the use of renal artery stenting combined with aggressive medical therapy improve outcomes in patients with severe atherosclerotic renal artery stenosis?

### Bottom Line

In patients with severe atherosclerotic renal artery stenosis and hypertension or chronic kidney disease, renal artery stenting does not provide an additional benefit when added to comprehensive medical therapy that includes blood pressure and diabetes mellitus management, and antiplatelet and lipid therapies. (Level of Evidence = 1b)

### Synopsis

These investigators enrolled 947 patients with severe atherosclerotic renal artery stenosis (60% stenosis or more). Eligible patients also had systolic hypertension while taking two or more antihypertensive medications or chronic kidney disease. Using concealed allocation, patients were randomized to receive stenting plus medical therapy or medical therapy alone. Medical management included antiplatelet agents, antihypertensives, and lipid-lowering therapies. Specifically, all patients received candesartan (Atacand) with or without hydrochlorothiazide, as well as the combination pill amlodipine/atorvastatin (Caduet). Diabetes was managed according to clinical practice guidelines. The two groups had similar comorbidities at baseline. Overall, 90% of patients in each group had hyperlipidemia and approximately 30% had diabetes. The primary outcome was a composite of death from cardiovascular or renal causes, stroke, myocardial infarction, hospitalization for acute heart failure, worsening renal insufficiency, or the need for permanent dialysis. At a median follow-up of 43 months, there was no significant difference detected between the two groups in the composite outcome (hazard ratio = 0.95; 95% confidence interval, 0.76 to 1.17) or its individual components. All-cause mortality was also similar (hazard ratio = 0.80; 95% confidence interval, 0.58 to 1.12). ▶

**Study design:** Randomized controlled trial (nonblinded)

**Funding source:** Industry plus government

**Allocation:** Concealed

**Setting:** Outpatient (any)

**Reference:** *Cooper CJ, Murphy TP, Cutlip DE, et al.; CORAL Investigators. Stenting and medical therapy for atherosclerotic renal-artery stenosis. N Engl J Med. 2014;370(1):13-22.*

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## Platelet-Rich Plasma May Minimally, If at All, Benefit Patients with Knee Osteoarthritis

### Clinical Question

Is the injection of platelet-rich plasma beneficial in the management of symptomatic knee osteoarthritis in adults?

### Bottom Line

Compared with normal saline or hyaluronic acid, multiple intra-articular injections of platelet-rich plasma significantly improved knee function but did not reduce perceived pain or improve patient satisfaction in adults with symptomatic knee osteoarthritis. (Level of Evidence = 1a–)

### Synopsis

These investigators thoroughly searched Medline, Embase, the Cochrane Register, and bibliographies of retrieved citations for studies that evaluated the effectiveness of intra-articular platelet-rich plasma for the treatment of knee osteoarthritis in adults. They included only high-quality randomized controlled trials and cohort studies of patients 18 years or older, with a minimum of 24

weeks of follow-up. No language restrictions were applied. Outcome assessments occurred using previously validated scoring tools for function, pain, and patient satisfaction. Two individuals independently critiqued potential articles for inclusion and methodologic quality. Discrepancies were resolved by consensus discussion with a third reviewer.

Six trials (N = 577 patients) met the inclusion criteria, including four randomized trials and two comparative control groups. Platelet-rich plasma preparation techniques varied among studies, but all six included multiple injections. Five of the studies used hyaluronic acid as the control injection and one used normal saline. After 24 weeks, functional scores improved significantly in the platelet-rich plasma groups compared with the control groups, but there were no significant differences between treatment groups and control groups with respect to pain scores and patient satisfaction. The platelet-rich plasma groups had a significantly higher incidence of adverse events compared with the control groups, although all the complications were nonsevere and self-limited. A formal analysis found minimal heterogeneity in the results among the various trials. No formal evaluation was performed to assess for publication bias.

**Study design:** Meta-analysis (other)

**Funding source:** Industry plus government

**Setting:** Various (meta-analysis)

**Reference:** *Khoshbin A, Leroux T, Wasserstein D, et al. The efficacy of platelet-rich plasma in the treatment of symptomatic knee osteoarthritis: a systematic review with quantitative synthesis. Arthroscopy. 2013;29(12):2037-2048.*

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