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This series is coordinated by Sumi Sexton, MD, Associate Medical Editor.

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Diagnosing and Managing Acute Heart Failure Guidelines: NICE

Clinical Question

How should new onset acute heart failure be identified and treated?

Bottom Line

There is not much new in these guidelines except some caveats on what not to do. Diagnose new acute heart failure with a natriuretic peptide measurement and, if the level is high, follow with transthoracic echocardiography. Do not routinely treat with opiates, nitrates, inotropes, vasopressors, or continuous positive airway pressure ventilation. Almost all of their recommendations are based on very low quality evidence, often from nonrandomized studies. It is not that their recommendations are suspect; it is more of a comment on the state of the evidence for treatment of a very common problem. (Level of Evidence = 5)

Synopsis

These guidelines come from the United Kingdom's National Institute for Health and Care Excellence (NICE). They suggest a two-step method of diagnosing suspected acute heart failure: Perform a single measurement of either serum natriuretic peptides and, if greater than 100 pg per mL (100 ng per L) for B-type natriuretic peptide or 300 pg per mL (300 ng per L) for N-terminal pro-B-type natriuretic peptide, follow with transthoracic echocardiography within 48 hours. Treat with a diuretic and a beta blocker, and consider starting an angiotensin-

converting enzyme inhibitor (or angiotensin receptor blocker if the patient experiences intolerable adverse effects) in patients with reduced ejection fraction. Consider an aldosterone antagonist only in patients who cannot tolerate either of these approaches. The guidelines specifically recommend against several treatment approaches: routine use of opiate, nitrate, inotrope, or vasopressor therapy, and routine noninvasive ventilation (e.g., continuous positive airway pressure ventilation).

Study design: Practice guideline

Funding source: Government

Setting: Various (guideline)

Reference: Dworzynski K, Roberts E, Ludman A, Mant J; Guideline Development Group. Diagnosing and managing acute heart failure in adults: summary of NICE guidance. *BMJ*. 2014;349:g5695.

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Injection Equals Physical Therapy for Shoulder Impingement

Clinical Question

Is corticosteroid injection more effective than physical therapy in the management of nontraumatic shoulder pain?

Bottom Line

Both physical therapy and corticosteroid injection decrease pain and disability by about 50% within one month of beginning treatment. However, average scores will not improve beyond that over the course of the year, and the average person will have pain, disability, and an altered quality of life one year later. Let patients know that neither treatment is a silver bullet for functional shoulder pain and that they are likely to have some long-term problems no matter which treatment they select. (Level of Evidence = 1b)

Synopsis

The investigators enrolled 104 adults who were referred for physical therapy from family medicine or orthopedic clinics. The patients had shoulder pain without evidence of trauma, rotator cuff tear, or cervical spine-related symptoms, and were loosely defined as having "shoulder

impingement syndrome.” The patients (65% men; mean age of 42 years) were randomized, using concealed allocation, to receive six twice-weekly sessions of physical therapy or up to three subacromial injections of triamcinolone acetonide, 40 mg, over the course of a year. The physical therapy consisted of mobilization, stretching, and exercising based on an assessment of the patient’s weakness, mobility, and pain. Home exercises were also prescribed. Patients in both groups improved quickly, with an approximately 50% improvement in shoulder pain and function as measured by the Shoulder Pain and Disability Index by one month, which was maintained in both groups over the subsequent 11 months. Similarly, pain scores and quality of life scores were improved. The average patient in either group still had residual pain and/or disability; 38% of patients in the corticosteroid group had more than one injection.

Study design: Randomized controlled trial (nonblinded)

Funding source: Industry

Allocation: Concealed

Setting: Outpatient (specialty)

Reference: Rhon DI, Boyles RB, Cleland JA. One-year outcome of subacromial corticosteroid injection compared with manual physical therapy for the management of the unilateral shoulder impingement syndrome: a pragmatic randomized trial. *Ann Intern Med.* 2014;161(3):161-169.

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Metformin Associated with Less Need for a Second Medicine

Clinical Question

How well do oral hypoglycemics treat type 2 diabetes mellitus without the addition of a second treatment?

Bottom Line

In this retrospective analysis, which benefits from large numbers of patients but suffers from possible biases, patients who initially took an oral hypoglycemic other than metformin (Glucophage) were significantly more likely to require a second oral agent. If prescribed a sulfonylurea,



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they were more likely to experience a cardiovascular event over the following year; if prescribed a thiazolidinedione or a dipeptidyl peptidase-4 inhibitor (gliptin), they incurred significantly more out-of-pocket cost of treatment. Despite guideline recommendations and good evidence of benefit, more than 40% of newly diagnosed patients were not prescribed metformin. (Level of Evidence = 2b)

Synopsis

This study evaluated a data set of one of the national health insurers in the United States. The researchers identified 15,516 patients who were started on a single oral hypoglycemic medicine. They analyzed subsequent prescriptions and hospitalizations for at least one year. Only 57.8% of patients received metformin as their initial therapy, which is recommended by most guidelines based on clear evidence of benefit. About one in four patients initially receiving metformin was eventually prescribed a second oral medicine, which was significantly less than those who started on a sulfonylurea (37.1%), a thiazolidinedione (39.6%), or a gliptin (36.2%). Patients started on a sulfonylurea were more likely than those taking other drugs to be subsequently started on insulin (9.1% vs. 5.1% to 6.2%). Patients started on a sulfonylurea were more likely to experience a cardiovascular event or a diagnosis of hypoglycemia. Patients initially prescribed a thiazolidinedione or a gliptin paid significantly more out of pocket.

Study design: Cohort (retrospective)

Funding source: Industry

Setting: Outpatient (any)

Reference: Berkowitz SA, Krumme AA, Avorn J, et al. Initial choice of oral glucose-lowering medication for diabetes mellitus: a patient-centered comparative effectiveness study. *JAMA Intern Med.* 2014;174(12):1955-1962.

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Low-Carbohydrate Diet Better Than Low-Fat Diet to Reduce Cardiovascular Risk Factors and Cause Weight Loss

Clinical Question

Is a low-fat or a low-carbohydrate diet more effective in causing weight loss and improving cardiovascular disease risk?

Bottom Line

More than 40 years ago, Dr. Robert Atkins wrote his first book advocating for a low-carbohydrate diet to cause and sustain weight loss. This study (of mostly women) found that a low-carbohydrate diet—though not as severe a diet as the Atkins approach—caused an average 3.5 kg (7.7 lb) greater weight loss than a low-fat diet. Both diet approaches were undertaken without any caloric restriction; in other words, these were low-carbohydrate and low-fat, not low-calorie, diets. (Level of Evidence = 1b–)

Synopsis

The 148 participants were volunteers from the general public: 88% were women and 50% were black. They were randomized, concealed allocation uncertain, to a diet of fewer than 40 g of carbohydrates per day (the Atkins diet suggests fewer than 20 g per day) or a diet aimed to keep fat to less than 30% of daily energy intake, which is in line with the diet recommended by the National Cholesterol Education Program in the United States. Neither diet included a specific calorie goal.

Participants in both groups received significant counseling consisting of individual weekly sessions with a dietitian for the first four weeks followed by small-group counseling sessions every other week for the next five months. At 12 months, the low-carbohydrate diet group lost an average of 3.5 kg more than the low-fat diet group (–5.3 vs. –1.8 kg [–11.7 vs. –4.0 lb]). They also had greater reductions in fat mass and higher gains in lean mass. Although total cholesterol levels did not markedly change in either group, high-density lipoprotein levels increased significantly more in the low-carbohydrate group, and triglyceride levels decreased significantly more in that group, as well. Blood pressure, glucose levels, and insulin levels were not different between the groups.

Study design: Randomized controlled trial (nonblinded)

Funding source: Government

Allocation: Uncertain

Setting: Outpatient (any)

Reference: Bazzano LA, Hu T, Reynolds K, et al. Effects of low-carbohydrate and low-fat diets: a randomized trial. *Ann Intern Med.* 2014;161(5):309-318.

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