

centage was calculated; 34.9% of the prevalence of low systolic pressure and 17.9% of the prevalence of low diastolic pressure were associated with cognitive impairment.

Based on study findings, the authors conclude that low blood pressure in very old people may be associated with poor functional status, cardiac insufficiency, and, more importantly, cognitive impairment. It would be expected that low blood pressure is associated with increased mortality in this age group.

Guo Z, Viitanen M, Winblad B: Clinical correlates of low blood pressure in very old people: The importance of cognitive impairment. *J Am Geriatr Soc* 1997;45:701-705.

Intensive insulin treatment: Prognosis after acute MI in patients with diabetes mellitus

A total of 620 patients with diabetes mellitus and acute myocardial infarction were randomly assigned to receive standard treatment plus insulin-glucose infusion for at least 24 hours followed by multi-dose insulin treatment (study group) or to receive standard treatment only (control group). The study group comprised 306 patients; the control group, 314 patients.

The main outcome measure was long-term all-cause mortality. The mean follow-up was 3.4 years (range, 1.6 to 5.6 years). In the treatment group, 102 (33%) patients died, compared with 138 (44%) in the control group (relative risk, 0.72; 95% confidence interval, 0.55 to 0.92; $P=.011$). The effect was most pronounced among the predefined group that included 272 patients without previous insulin treatment and at a low cardiovascular risk (relative risk, 0.49; 95% confidence interval, 0.30 to 0.80; $P=.004$).

Study findings indicate that treatment with insulin-glucose infusion followed by intensive subcutaneous insulin treatment in diabetic patients with acute myocardial infarction improves long-term survival by nearly a third. The effect seen at 1 year appears to last for at least 3.5 years, with an absolute reduction in mortality of

11%. Translated: one life was saved for nine treated patients.

Malmberg K for the DIGAMI (Diabetes Mellitus Insulin Glucose Infusion in Acute Myocardial Infarction) Study Group: Prospective randomised study of intensive insulin treatment on long term survival after acute myocardial infarction in patients with diabetes mellitus. *BMJ* 1997;314:1512-1515.

Impact of asthma on use, cost of healthcare

A population-based historical cohort study was conducted to measure the impact of asthma on the use and cost of healthcare by children in managed care organizations. The study population comprised 71,818 children, aged 1 to 17 years, who were enrolled in a medium-sized staff model health maintenance organization and used services during 1992.

Automated encounter data were used to identify children with one or more asthma diagnoses during 1992. Nonurgent outpatient visits, pharmacy-filled prescriptions, urgent care visits, and hospital days as well as associated costs, were measured. All services were categorized as asthma care or nonasthma care. Marginal cost for asthma (difference in total cost between children with asthma and other children using services, adjusted for covariates) was computed by multivariate regression analysis.

The treated prevalence of asthma was 4.9%. Children with asthma incurred 88% more costs (\$1060.32 vs \$563.81 per year), made 65% more nonurgent outpatient visits (5.75 vs 3.48 per year), and had 2.77 as many prescriptions (11.59 vs 4.19 per year), and had twice as many inpatient days (0.23 d/y vs 0.11 d/y) compared with the general population of children using services. Asthma care represented 37% of all healthcare received by children with asthma, while the remaining 63% were for nonasthma services. Almost two thirds of asthma-related costs were attributable to nonurgent patient care and prescriptions; only one third was attributable to urgent care and hospitalizations. Controlling for age, sex, and comorbidities, the marginal cost

of asthma was \$615.17/y (95% confidence interval, \$502.73, \$727.61), which includes asthma as well as nonasthma services.

These findings show that children with asthma use significantly more health services (and incur significantly more costs) than other children using services, attributable largely to care of asthma. The majority of all healthcare costs for children with asthma were for nonasthma services. Urgent care visits and hospitalizations are less important components of asthma costs in this managed care organization than has been found in other national studies.

Lozano P, Fishman P, VonKorff M, Hecht J: Health care utilization and cost among children with asthma who were enrolled in a health maintenance organization. *Pediatrics* 1997;99:757-764.

Long-term treatment with salmeterol and asthma control

A double-blind, randomized crossover study was conducted to determine the effect of adding the β_2 -agonist salmeterol, 50 μ g twice daily for 6 months, to current treatment in subjects with asthma who control their corticosteroid dose according to a management plan.

Subjects were 101 patients with mild or moderate asthma who take at least 200 μ g of beclomethasone dipropionate or budesonide twice daily. All subjects had stable asthma at entry, with no exacerbations or respiratory tract infection in the previous 6 weeks. The subjects inhaled placebo and salmeterol from identical dry powder inhalers for 6 months, followed by a 1-month washout. Subjects adjusted inhaled steroid dose according to guidelines. A computer program randomized the order of treatment.

Data were available for 87 subjects. When compared with placebo, salmeterol treatment was associated with a 17% reduction in inhaled steroid use (95% confidence interval, 0.12 to 0.22). The number of subjects who had an exacerbation or use of oral steroid in each group was not statistically significant (25% in the group receiving the placebo

vs 16% of the salmeterol-treated group).

For secondary end points, treatment with salmeterol was associated with higher morning and evening peak expiratory flow and forced expiratory volume in 1 second (FEV₁); a reduction in symptoms, use of bronchodilators, and airway responsiveness to methacholine. Also, salmeterol treatment had no effect on serum potassium concentration, 24-hour heart rate, or the final FEV₁ achieved during a salbutamol dose-response study.

Therefore, it is concluded that, in subjects who adjusted their treatment with inhaled steroid according to guidelines, the addition of salmeterol, 50 µg twice daily, was associated with a reduction in use of inhaled steroid and improved lung function and control of symptoms.

Wilding P, Clark M, Coon JT, et al: Effect of long term treatment with salmeterol on asthma control: a double blind, randomised crossover study. *BMJ* 1997;314:1141-1146.

Body mass index as measure of fatness in children

A cross-sectional study evaluated whether body mass index (BMI) is a representative equivalent measure of body fatness independent of age, race, gender, sexual maturation, and distribution of fat in children and adolescents.

Included in the study were 192 healthy subjects (100 boys and 92 girls, 103 white and 89 black) aged 7 to 17 years. The subjects had their height and weight measured in the standard manner, and BMI (kg/m²) was calculated from these values. Dual energy x-ray absorptiometry was used to determine fat mass and percent body fat. Sexual maturation was evaluated by physical assessment. Distribution of fat was determined by the waist-to-hip ratio.

Except for the waist-to-hip ratio, there were no significant differences by gender and ethnic group for any of the demographic or anthropometric variables. White boys had a higher waist-to-hip ratio than black boys. BMI was significantly and positively correlated with age, stage of maturation, and all the anthro-

pometric variables in each race-sex group. The correlation of maturation stage with BMI was stronger than the correlation between age and BMI. A multiple regression analysis showed that BMI, gender, race, sexual maturation, and distribution of fat were all significant independent correlates of the percent body fat (multiple R²=.77). The percent body fat-BMI relationship was dependent on the stage of sexual maturation, gender (for an equivalent BMI, girls have greater amounts of body fat than boys), race (for equivalent BMI, whites have higher body fat than blacks), and waste-to-hip ratio (for equivalent BMI, those with central obesity have greater body fatness than those with peripheral obesity).

BMI was found not to be an equivalent measure of the percent body fat for each race-sex group. When BMI is used as a measure of body fatness in a research or clinical setting, particularly when comparisons are made across race and gender, it may be important to consider the maturation stage, race, gender, and distribution of body fat in the interpretation of the results.

Daniels SR, Khoury PR, Morrison JA: The utility of body mass index as a measure of body fatness in children and adolescents: Differences by race and gender. *Pediatrics* 1997; 99:804-807.

Body weight and prevention of CHD, stroke, diabetes in middle-aged men

In this prospective study of a male cohort, 7735 men, aged 40 to 59 years at screening, were selected from one general practice in each of 24 British towns. They were followed up for an average of 14.8 years to determine the body mass index (BMI) associated with the lowest morbidity and mortality. Specific outcome measures included all-cause death rate, heart attacks, and stroke (fatal and non-fatal) and development of diabetes mellitus, or any of these outcomes (combined end point).

A total of 1271 deaths occurred from all causes, 974 heart attacks, 290 strokes, and 245 new onset diabetes mellitus. All-

cause mortality was increased only in men with a BMI (kg/m²) less than 20.0 and in men with a BMI equal to or greater than 30.0. However, even after age, smoking, social class, alcohol consumption, and physical activity were adjusted for, the risk of cardiovascular death, heart attack, and diabetes increased progressively from an index of less than 20.0.

For the combined end point, the lowest risks were seen for a BMI of 20.0 to 23.9. In never-smokers and former smokers, deaths from any cause rose progressively from a BMI of 20.0 to 21.9 and for the combined end point, from 20.0 to 23.9. Age-adjusted levels of a wide range of cardiovascular risk factors rose or fell progressively from an index of less than 20.0. It appears from these findings that in the middle-aged British men studied, a healthy BMI is about 22.0.

Shaper G, Wannamethee SG, Walker M: Body weight: Implications for the prevention of coronary heart disease, stroke, diabetes mellitus in a cohort study of middle aged men. *BMJ* 1997; 314:1311-1317.

Sleep-disordered breathing in diastolic heart failure

Sleep-disordered breathing is common in congestive heart failure. Although isolated diastolic heart failure (DHF) accounts for up to a third of all cases of congestive heart failure, the prevalence of sleep-disordered breathing in DHF is unknown. Therefore, the authors sought to determine the prevalence and characteristics of sleep-disordered breathing in a group of patients with symptomatic DHF.

The study group comprised 20 subjects (13 women, 7 men; mean age, 65±6.0 years; mean body mass index [BMI] 28±3.2) with symptomatic DHF (New York Heart Association class II or III) and isolated diastolic dysfunction on echocardiograms. All subjects were assessed with lung function tests, modified sleep and health questionnaire, and overnight polysomnography. Significant sleep-disordered breathing was defined as an apnea/hypopnea index (AHI) greater than 10.

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