ACCF Complementary Medicine Expert Consensus Document—Online Appendices

Integrating Complementary Medicine Into Cardiovascular Medicine

A Report of the ACCF Task Force on Clinical Expert Consensus Documents (Writing Committee to Develop an Expert Consensus Document on Complementary and Integrative Medicine)

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The recommendations set forth in this report are those of the Writing Committee and do not necessarily reflect the official position of the American College of Cardiology Foundation.

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Appendix III: Internet Sources for Complementary Medicine Information

1. **About ConsumerLab.com**
   www.consumerlabs.com
   ConsumerLab.com, LLC ("CL") provides independent test results and information to help consumers and healthcare professionals evaluate health, wellness, and nutrition products. It publishes results of its tests online and includes listings of brands that have passed testing. Products that pass CL's testing are eligible to bear the CL Seal of Approval. CL addresses a growing need of consumers and healthcare professionals for better information to guide the selection of health, wellness, and nutrition products.

2. **Academy for Guided Imagery**
   www.interactiveimagery.com
   The Academy for Guided Imagery is dedicated to educating and supporting practicing clinicians in their uses of imagery and imagery related approaches to therapy and healing. The Academy is an accredited Post-graduate training provider for health professionals and a source of self-care products and programs for those struggling with a chronic, difficult, or painful illness.

3. **AETNA InteliHealth**
   http://www.intelihealth.com/IH/ihtIH/WSIHW000/8513/8513.html?k=navx408x8513
   This online company provides consumer-friendly health information from Harvard Medical School, University of Pennsylvania School of Dental Medicine and more than 150 top health care organizations. This section of the web site provides information on herbal supplements and other alternative medicine treatments.

4. **Agency for Healthcare Research and Quality**
   "Garlic: Effects on Cardiovascular Risks and Disease, Protective Effects Against Cancer, and Clinical Adverse Effects"
   http://ahrq.gov/clinic/epcsums/garlicsum.htm
   This report summarizes clinical studies of garlic in humans, focusing on cardiovascular-related disease, cancer, and clinical adverse effects.

5. **American Academy of Medical Hypnoanalysis**
   http://aamh.com/

Under the umbrella of AAMH, hypnoanalysis is used by qualified persons in medicine, psychology and other scientific fields to decrease human suffering and promote human welfare.

6. **American Association for Health Freedom**
www.apma.net/about.htm
The American Association for Health Freedom is the political voice for health care practitioners who use nutritional and other complementary therapies in patient care.

7. **American Biologics (Committee for Freedom of Choice in Medicine)**
http://www.americanbiologics.com/abset.htm

8. **American Botanical Council**
http://www.herbalgram.org
The American Botanical Council is a non-profit research and educational organization that promotes the safe and effective use of medicinal plants.

9. **American Herbal Products Association**
www.ahpa.org
The American Botanical Council is a national trade association for the herbal products industry dealing with the many scientific, technical and political issues surrounding the responsible trade of botanicals.

10. **American Holistic Medical Association**
www.holisticmedicine.org
The American Holistic Medical Association is an organization devoted to educating and training physicians in the art and science of holistic medicine.

11. **American Holistic Nurses Association**
http://ahna.org
The American Holistic Nurses Association serves as a bridge between the traditional medical paradigm and universal complementary and alternative healing practices.

12. **American Music Therapy Association**
www.musictherapy.org
The American Music Therapy Association is an established healthcare profession that uses music to address physical, emotional, cognitive, and social needs of individuals of all ages.

13. **American Pharmacists Association**
www.aphanet.org/
The American Pharmacists Association (APhA), is the national professional society of pharmacists, founded originally in 1852 as the American Pharmaceutical Association. The Association provides professional information and education for pharmacists and advocates for improved health of the American public through the provision of comprehensive pharmaceutical care.

The following report, American Dietetic Association/American Pharmaceutical Association Special Report, "A Healthcare Professional's Guide to Evaluating Dietary Supplement," can be accessed at http://www.pharmacist.com/pdf/dietary_supplements.pdf.

14. **American Society of Anesthesiologists**
"What You Should Know About Herbal and Dietary Supplement Use and Anesthesia"
www.asahq.org/patientEducation/herbPatient.pdf
The American Society of Anesthesiologists' document provides questions and answers about herbal dietary supplements, their uses and possible side effects as well as drug interactions.

15. **Biofeedback Certification Institute of America**
www.bcia.org
The Biofeedback Certification Institute of America (BCIA) was formed in January 1981 to establish and maintain professional standards for the provision of biofeedback services and to certify those who meet these standards.

16. **CAM Research Center for Cardiovascular Diseases**
www.med.umich.edu/camrc/index.html
The University of Michigan's Complementary and Alternative Research Center (CAMRC) began in 1998 with a five year, $6.7 million grant from the National Institute of Health (NCCAM) to investigate CAM therapies that may help prevent, manage and treat cardiovascular disease and its associated conditions.

17. **Center for Mindfulness in Medicine Healthcare and Society**
www.umassmed.edu/cfm/
The Center for Mindfulness in Medicine, Health Care, and Society is dedicated to furthering the practice and integration of mindfulness in the lives of individuals, institutions, and society through a wide range of clinical, research, education, and outreach initiatives in the public and private sector.

18. **ClinicalTrials.gov**
www.clinicaltrials.gov
ClinicalTrials.gov provides regularly updated information about federally and privately supported clinical research in human volunteers. ClinicalTrials.gov gives you information about a trial's purpose, who may participate, locations, and phone numbers for more details.

19. **Cochrane Collaboration Database of Systematic Reviews**
http://www3.interscience.wiley.com/cgi-bin/mrwhome/106568753/HOME
The Cochrane Library is a unique source of reliable and up-to-date information on the effects of interventions in health care. Published on a quarterly basis, The Cochrane Library is designed to provide information and evidence to support decisions taken in health care and to inform those receiving care.

20. **Complementary and Alternative Medicine Journals**
www.medbioworld.com/med/journals/complementary.html
This online company provides the largest medical and bioscience reference and resource directory on the Internet. The site is currently ranked #1 for medical and bioscience directories by Google™, with links to 8,200 journals within 80 medical and bioscience specialties; the home pages of 7,000 medical and bioscience associations; and links to over 2,000 bioscience

companies. Other research and reference tools include dictionaries and glossaries, search engines, disease databases, clinical trials, medical guidelines, education and training, and medical journal full-text articles and abstracts.

21. **Directory of Databases**
    www.rosenthal.hs.columbia.edu/Databases.html
    The Directory of Databases is an online feature of The Richard and Linda Rosenthal Center for Complementary and Alternative Medicine. It was designed to facilitate research by both professionals and the public. This may be clinical, biomedical, review, meta-analytical or survey research. The listing is hyperlinked to existing Web sites where available, and to brief information on the resource, such as: how to obtain further details; type of literature covered; whether fee-based access or free; size of the holding; and mode of access. The major bibliographic databases offer comprehensive coverage of alternative and complementary medicine information.

22. **Dr. Andrew Weil's Self Healing Creating Natural Health For Your Body and Mind**
    www.drweilselfhealing.com
    Dr. Andrew Weil's Self Healing online website provides information on Integrative Medicine, expert advice in a newsletter, plus a store with self healing products.

23. **U.S. Food and Drug Administration – (FDA) Dietary Supplements**
    www.cfsan.fda.gov/~dms/supplmnt.html/
    The U.S. Food and Drug Administration is responsible for ensuring that a dietary supplement is safe before it is marketed. The FDA's post-marketing responsibilities include monitoring safety, e.g. voluntary dietary supplement adverse event reporting, and product information, such as labeling, claims, package inserts, and accompanying literature. The Federal Trade Commission regulates dietary supplement advertising.

24. **Food and Drug Administration - Medwatch**
    www.fda.gov/medwatch
    MedWatch is the U.S. Food and Drug Administration's Safety Information and Adverse Event Reporting Program and can be used for reporting a serious adverse event or product problem that you suspect is associated with a drug or medical device you have used, prescribed or dispensed.

    Reporting for Consumers: 800-FDA-4010
    www.fda.gov/medwatch/report/consumer/consumer.htm
    MedWatch is the Food and Drug Administration's (FDA) program for reporting serious reactions and problems with medical products, such as drugs and medical devices.

    Reporting for Healthcare Professionals: 800-FDA-1088
    www.fda.gov/medwatch/report/hcp.htm

25. **Global Academy – Institute for Integrative Medicine**
    www.theglobalacademy.org/int_medicine.asp
    The Global Academy recognizes the value of Integrative Medicine in terms of disease prevention, healing capacity, and greater accessibility. GA strives for acceptance of integrative medicine by leading medical schools and hospitals, insurance companies, and governmental healthcare organizations.

26. **Herb Medicine**
http://www.herbmed.org/index.asp
HerbMed is an interactive, electronic herbal database that provides hyperlinked access to the scientific data underlying the use of herbs for health. It is an evidence-based information resource for professionals, researchers, and general public. HerbMed® is a project of the Alternative Medicine Foundation, Inc.

27. **Herb Research Foundation**
www.herbs.org
The Herb Research Foundation is the world's first and foremost source of accurate, science-based information on the health benefits and safety of herbs---and expertise in sustainable botanical resource development.

28. **Himalayan International Institute of Yoga, Science and Philosophy**
www.himalayaninstitute.org
A leader in the field of yoga, meditation, spirituality, and holistic health, the Himalayan Institute was founded by Swami Rama of the Himalayas. The mission of the Himalayan Institute is Swami Rama's mission—to discover and embrace the sacred link—the spirit of human heritage that unites East and West, spirituality and science, and ancient wisdom and modern technology. The Institute uses time-tested techniques of yoga, Ayurveda, integrative medicine, principles of spirituality, and holistic health.

29. **Integrative Medicine**
www.onemedicine.com
Integrative Medicine is a private, venture capital-backed information services company founded in 1998. The company focuses on the delivery of scientific, online information and advisory services in four main areas: professional clinical information, consumer clinical information, professional training, and the business/implementation of integrative medicine.

30. **International Academy of Alternative and Anti-Aging Medicine**
    Anti-Aging/Alternative Medicine News and Updates
http://www.gvi.com/gviweb/iaam/AntiAgingNews.html
The International Academy of Anti-Aging Medicine, established approximately 20 years ago, produces monthly, on-line anti-aging news and science updates. Using a science-based approach, combined with the input of more than 15 experts in the field of alternative medicine and anti-aging research, and in cooperation with the scientists from the Journal of Longevity, the updates provides a solid path toward anti-aging and rejuvenation.

31. **International Bibliographic Information on Dietary Supplements (IBIDS) Database**
    National Institutes of Health, Office of Dietary Supplements and the National
    Agricultural Library, Food and Nutrition Information Center
http://ods.od.nih.gov/databases/ibids.htm
IBIDS is a comprehensive bibliographic database that helps health care providers, researchers, and consumers find credible, scientific literature on dietary supplements. Visitors may search for either consumer-oriented, professional level (peer-reviewed research) documents, or both. Currently, the database contains dietary supplements citations/abstracts from MEDLINE, AGRICOLA, and AGRIS databases dating from 1986 to the present.

32. **International Society for the Study of Subtle Engergies and Energy Medicine**
www.issseem.org

ISSSEEM was founded to explore the application of subtle energies to the experience of consciousness, healing, and human potential and is designed as a bridging organization for scientists, clinicians, therapists, healers, and laypeople. ISSSEEM encourages experimental exploration of the phenomena long associated with the practice of energy healing.

33. **Intramedicine**
www.intramedicine.com
Intramedicine provides online information and educational services that help physicians and consumers.

34. **MedlinePlus**
www.nlm.nih.gov/medlineplus
MedlinePlus has extensive information from the National Institutes of Health and other trusted sources on over 650 diseases and conditions. There are also lists of hospitals and physicians, a medical encyclopedia and a medical dictionary, health information in Spanish, extensive information on prescription and nonprescription drugs, health information from the media, and links to thousands of clinical trials. MedlinePlus is updated daily and can be bookmarked at the URL: medlineplus.gov. There is no advertising on this site, nor does MedlinePlus endorse any company or product.

35. **MedWeb**
www.MedWeb.Emory.Edu/MedWeb
MedWeb is an online resource maintained by the staff of the Robert W. Woodruff Health Sciences Center Library of Emory University. Some electronic databases and online journals are available only to Emory faculty, staff and students.

36. **The Mind Body Medical Institute**
www.mbmi.org/Default.asp
The Mind Body Medical Institute provides medical services for persons with infertility, heart disease, cancer, and other stress-related health concerns.

37. **National Center for Complementary and Alternative Medicine**, **National Institutes of Health**
http://nccam.nih.gov
The National Center for Complementary and Alternative Medicine (NCCAM) is 1 of the 27 institutes and centers that make up the National Institutes of Health (NIH). The NCCAM Web site includes publications, information for researchers, frequently asked questions, and links to other CAM-related resources and is the public point of contact for scientifically based information on CAM and for information about NCCAM.

Databases located on the NCCAM Web site include: CAM on PubMed, a subset of the National Library of Medicine's PubMed, which provides access to complementary and alternative medicine journal citations; and CHID (the Combined Health Information Database), a reference tool to find patient education materials.

38. **National Heart Lung and Blood Institute, (NHLBI) NIH**
www.nhlbi.nih.gov
The National Heart, Lung, and Blood Institute (NHLBI) provides leadership for a national program in diseases of the heart, blood vessels, lung, and blood; blood resources; and sleep disorders. Since October 1997, the NHLBI has also had administrative responsibility for the NIH Woman's Health Initiative. 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. Research is related to the causes, prevention, diagnosis, and treatment of heart, blood vessel, lung, and blood diseases; and sleep disorders.

39. **National Institute for the Clinical Application of Behavioral Medicine**
www.nicabm.com
NICABM sets the standard for excellence in mind body medicine training.

40. **Natural Medicines Comprehensive Database**
www.naturaldatabase.com
The Natural Medicines Comprehensive Database, first released in September 1999, provides evidence-based resource information on prescription and non-prescription drugs and provided information on natural medicines. Leaders in conventional medicine as well as complementary, alternative, and integrative medicine recognize the Database as the go-to resource for the most complete and practical information.

The website also includes a database and web site specifically for patients. The content of the patient-oriented web site is integrated into the professional Web site so health professionals who use www.NaturalDatabase.com instantly have access to all of the patient education info and can print them for a patient at any time.

41. **NIH Consensus Development Program**
http://www.consensus.nih.gov/
The NIH Office of Medical Applications of Research (OMAR) manages the NIH Consensus Development Program, the focal point for evidence-based assessments of medical practice and state-of-the-science on behalf of the medical community and the public. Under this program, OMAR organizes major conferences that produce consensus statements and state-of-the-science statements on controversial issues in medicine important to health care providers, patients, and the general public. NIH Consensus Statements and State of the Science Statements are disseminated widely, and more than 120 NIH Consensus Statements and State-of-the-Science Statements have been issued since the program's inception in 1977. Organizationally, OMAR is under the Associate Director for Disease Prevention in the Office of the Director at NIH.

42. **Office of Dietary Supplements**
http://dietary-supplements.info.nih.gov/
The ODS supports research and disseminates research results in the area of dietary supplements. The ODS also provides advice to other Federal agencies regarding research results related to dietary supplements.

43. **PubMed Literature Database - National Center for Biotechnology Information**
www.ncbi.nlm.nih.gov/pubmed
PubMed, a service of the National Library of Medicine, provides access to over 12 million MEDLINE citations back to the mid-1960's and additional life science journals. PubMed includes links to many sites providing full text articles and other related resources.

Established in 1988 as a national resource for molecular biology information, NCBI creates public databases, conducts research in computational biology, develops software tools for analyzing genome data, and disseminates biomedical information - all for the better understanding of molecular processes affecting human health and disease.

44. **Qigong Institute**
www.qigonginstitute.org

45. **University of Arizona Program in Integrative Medicine**
http://integrativemedicine.arizona.edu
The University of Arizona Program in Integrative Medicine (PIM) was founded by its Director, Andrew Weil, MD, in 1994 with the assistance of a core group of visionary leaders. Integrative Medicine is defined as healing-oriented medicine that takes account of the whole person (body, mind, and spirit), including all aspects of lifestyle. It emphasizes the therapeutic relationship and makes use of all appropriate therapies, both conventional and alternative.

46. **USDA National Agricultural Library, Food and Information Center (FNIC)**
www.nal.usda.gov/fnic
The FNIC website contains over 2000 links to current and reliable nutrition information. The food and human nutrition collection at the National Agricultural Library includes books, audiovisuals, kits, games, hands-on material, manuals, and journal articles.

47. **WebMD Corporation**
www.webmd.com
WebMD Corporation provides services that help physicians, consumers, providers, and health plans navigate the complexity of the healthcare system. The website includes online information, research, and educational services for physicians and consumers. WebMD is also a provider of physician practice management software and related services as well as electronic data interchange services for healthcare providers and health plans.

Dietary Supplements Reference Books:

Blumenthal M, et al. The ABC Clinical Guide to Herbs. American Botanical Council 2002. To order: 512-926-4900.

Brinker F. Herb Contraindications & Drug Interactions, 3rd Edition. Eclectic Medical Publications, 2001. ISBN: 1888483067. Designed to help pharmacists and physicians with herb contraindications and drug interactions. This text also provides information for consumers using herbs.

Peirce A. The American Pharmaceutical Association Practical Guide to Natural Medicine. New York, NY: William Morrow & Co.; 1999, ISBN: 0688161510. This book is a home reference for herbs and natural medicines.

Schultz V, Hansel R, Tyler VE. Rational Phytotherapy: A Physician's Guide to Herbal Medicine. 3rd ed. New York, NY; Springer; 1998.

Appendix IV: Review of the Literature for Cardiovascular Related Integrative Medicine

(Mind/Body approaches only) as referenced from
"The Scientific Basis for Holistic Medicine" by Robert A. Anderson, M.D.

Coronary Artery Disease

1. Angina prognosis/stress (1).

    30 patients with stable angina pectoris and ischemia on stress perfusion imaging underwent continuous ambulatory left ventricular monitoring, during which stress was induced by arithmetic mental calculations. 15/30 developed transient left ventricular dysfunction during the period of the stress. 915 experienced cardiac events over the next year (arrhythmias, MI, bypass surgery, angioplasty) vs. 3/15 who had not demonstrated left ventricular dysfunction with the stress experience (p=.025). At 2 years of follow up, the numbers were similar: 10/15 vs. 4/15 (p less than .025).

2. Angina pectoris post-mycocardial infarction (2).

    377 patients surviving acute myocardial infarction completed a profile of clinical and behavioral measurements. 13% had severe depression, 23% had moderate depression and 64% had low degrees of depression. The RR for followup angina pectoris with severe depression compared to low depression was 3.1 (95% CI 1.58 to 6.16). The risk for angina with high emotional instability was 5.6 (95% CI 2.9 to 10.7) The RR for angina with maintenance of smoking was 2.63 (95% CI 1.23 to 5.6). Depression and emotional instability were of greater significance for the risk for angina than was smoking.

3. Angina/health education (3).

    617 patients less than 65 years of age with a history of angina of >6 months without other serious health problems were assessed for clinical and laboratory information and randomly assigned to a control group ("usual" care) or an intervention group who were given practical relevant advice regarding cardiac risk factors updated every 4 months for 2 years. Overall mortality included 13 from the intervention group and 27 from the control group (OR 2.32, 95% CI 1.18 to 4.53). After adjustment for all determinable factors, the OR for cardiac death was 2.2 in the control group (95% CI 1.06 to 4.57). During the 2-year observation, 54% of the controls became less active and 28% of the interventionees became less active. The percentage engaging in physical activity dropped from 44% to 24% in controls and increased from 38% to 44% in the intervention group (p less than .0001). Angina decreased significantly compared to controls (p less than .0001) and a significant fall in drug use ensued in the intensively treated group (p=.004). Smoking, body mass index and blood pressure remained similar in both groups. Nutritional habits changed compared to the "usual care" group, with increased poultry (p=.02), green vegetables (p=.002), fiber (p=.01), and decreased red meat (p=.005), cookies and sweets (p=.0001), saturated fat (p=.01), and fried foods (p=.045).

4. Angina (4).

    In a group of 40 men with stable angina less than 60 years old, 20 were randomly assigned to an atenolol treatment group and 20 to a progressively increasing high intensity exercise group with daily calisthenics for one year. The atenolol group increased treadmill time 31% v. 72% in the exercise group (p less than .001). The time to 1 mm of ST depression increased 100% in the atenolol group compared to 136% in the exercise group. The overall tolerated heart workload increased in the atenolol group from 6.3 to 7.6 versus the exercise group from 6.3 to 9.5.

5. Angina/placebos (5).

    A meta-analysis of 13 studies of 1,187 patients with angina found subjective improvement in 82% of the patients with treatments over 4 decades which were shown subsequently to be placebos and to possess no specific therapeutic effect. Significant objective measures of improvement were also frequently seen, including improved exercise tolerance, improvements in the EKG and decreased medication use.

6. Angina/loving spousal support (6).

    In a prospective study of 10,000 Israeli men with documented angina, the risk of untoward cardiac events over 5 years was significantly greater in those with high anxiety and low levels of spousal and institutional support v. those with high levels of spousal love and institutional support (p less than .05). Institutional support meant frequent sources of assistance with rides, performance of tasks and financial help. The social support was one of seven predictive risk factors for untoward outcomes, including anxiety, global psychological problems, elevated cholesterol, SBP and DBP, type 2 diabetes and EKG abnormalities.

7. Angina/coronary artery bypass surgery/beliefs (7).

    In patients who had undergone CABG and whose grafts were shown several months later to be patent, 90% relief from angina was achieved. In the 35% of patients in whom follow up studies showed grafts to be closed, 60% relief from angina was still achieved. If relief of angina were totally due to increased oxygen delivery through a patent bypass, there would have been no relief in the 35% whose grafts were occluded.

8. Angina/surgery (8).

    In the 1950s and 1960s internal mammary ligation (ligating the internal mammary artery to force more blood through the natural anastamoses with the myocardium) became popular for persistent angina. Studies showed 70% relief from angina. Single-blind sham operations with randomly selected patients without ligation showed 70% pain relief, improvement in ECGs and greater exercise tolerance in many patients. The procedure was abandoned.

9.   Cardiac complications/reduced heart rate variability (9).

In a study population of 2,500 Framingham subjects free from CAD and CHF at baseline, cardiac events (angina pectoris, MI, coronary heart disease death, or CHF) occurred in 58 subjects during a mean follow-up of 3.5 years. After adjustment for age, sex, cigarette smoking, diabetes, left ventricular hypertrophy, and other relevant risk factors, all heart rate variability measures from ambulatory EKGs except the ratio of low-frequency to high-frequency power were significantly associated with risk for a cardiac event (p=.0016 to .0496). A one standard deviation decrement in the standard deviation of total normal R-R intervals was associated with a hazard ratio of 1.47 for new cardiac events (95% CI 1.16 to 1.86). The estimation of HRV by ambulatory monitoring offers prognostic information beyond that provided by the evaluation of traditional cardiovascular disease risk factors.

10. Arterial insufficiency-intermittent claudication (10).

Regular exercise leads to a marked increase in walking tolerance in 80% of patients with intermittent claudication. The improvement is probably due to improved hemorrheology which occurs with exercise. Drug treatment remains the popular treatment even though exercise is of indisputable benefit.

11. Atherosclerosis/hostility (11).

Proliferation of arterial smooth muscle cells is a key component of atherogenesis. A sample of 225 volunteers, aged 21 to 65 years, was exposed to "frustration", "harassment", or "relaxation", after completing the 50-item Hostility subscale of the Minnesota Multiphasic Personality Inventory (MMPI). Before and after exposure, whole blood was measured for platelet derived growth factor (PDGF), and serum samples evaluated for total and HDL cholesterol concentrations and serum mitogenic activity (SMA) independent of PDGF. BP and pulse were also evaluated. Analyses of SMA revealed an increase in mitogenic effect for cultured arterial smooth muscle cells when hostility was treated as a dichotomous modifier. Among high-hostility subjects, surprisingly, those in the relaxed group and those with a lower educational level were found to have a significantly higher mitogen response (p less than .01), respectively; no significant effects were observed for the low hostility groups. These data suggest that endogenous stresses may occur in high-hostility individuals when "relaxed", to lead to proliferation of arterial smooth muscle cells, as a contribution to atherogenesis. In individuals with lower educational levels and higher hostility scores, lifestyle changes may play a role.

12. Atherosclerosis/cynical distrust (12).

500 healthy premenopausal women were screened for standard cardiovascular risk factors and completed 3 psychological instruments for evaluation of psychological factors of trust, cynicism, anger, anxiety, self consciousness and holding anger in. Mean age was 47. 10 years later, 200 had completed ultrasound evaluation of both carotid intima-media thickness and the intimal plaque index, which is based on the surface area of involvement. Approximately one-half of the subjects had some intimal plaque and none had clinically significant disease. High correlations were found between those who had been or are smokers with three psychological characteristics: basic trait anger; holding anger in; and attitudes of distrust and

cynicism. After controlling for a number of risk factors including smoking, increasing levels of intimal thickening by quartiles showed a progressively closer significant relationship to holding anger in (p=.02), to cynical distrust (p=.04) and to public self-consciousness (p=.05). Women with high plaque scores tended to hold in anger, but this relationship reached only borderline statistical significance. Confirming previous work in men, attitude of cynical distrust and high levels of anger held in were related to increased risk of progressive atherosclerosis.

13. Atherosclerosis/stress, job pay (13).

940 male subjects in the Kuopio, Finland heart study were followed for carotid artery intimal/medial changes by ultrasound after assignment to a group who had highly demanding jobs with low income v. those who had jobs with low demands and high pay. Increase in arterial wall thickening was greater (.32 vs. .26 mm, p=.03) and plaque thickening was greater (.33 vs. .26 mm, p=.088) over a 4 year period in those with high job demands and low incomes.

14. Atherosclerosis/hopelessness (14).

942 men from the Kuopio, Finland study were assessed by interview and completed the 5-point Likert scale for hopelessness. They were then stratified to low, moderate or high hopelessness groups. Ultrasound exams then measured carotid intimal atherosclerotic thickening. Four years later, repeat ultrasounds showed a mean of 19.2% greater increase in maximal intimal thickness in the high hopelessness group v. the combined moderate/low hopelessness groups (p less than .03). Increase in intimal surface roughness index was significantly greater in the above-median group for hopelessness v. the below-median group (p less than .0024). Maximum roughness differences were even more significant (p less than .0003).

15. Carotid atherosclerosis/cynical distrust, anger (15).

In 119 men with the extent of carotid atherosclerosis established at baseline by ultrasonography, cynical distrust, impatience/irritability and anger-control were assessed. After controlling for LDL-cholesterol, smoking and age, cynical distrust (p=.001) and anger-control (p less than .001) predicted significantly higher progression of atherosclerosis on reassessment at the 2-year point with a RR of 2.0 compared to controls with low distrust and anger-control. Anger control subjects had intense feelings combined with attempts to avoid confrontational expression.

16. Atherosclerosis (16).

In an 11 year follow up study of 1,904 German vegetarian adults, those with medium and high physical activity had a relative risk for ASCVD of .47 and all-cause mortality of .49 compared to those with low physical activity at 1.0 (p=.04).

17. Atherosclerosis (17)

The lowest fitness quartile of 10,000 men had 10-year ASCVD mortality rates 8-fold greater than the highest quartile, and in 3,000 women the lowest fitness quartile mortality rate was 7-fold higher than the highest fitness quartile.

18. Atherosclerosis (18).

   Fitness lowers ASCVD morbidity and mortality. Exercise must be habitual, vigorous and of a continuous type in order to benefit. The active portion of a population, with rare exception, has a significantly lower risk for CAD. Estimates in meta-analysis of many studies would indicate that exercise lowers CAD risk by 33%.

19. Cardiovascular events/depression (19).

   It has been suggested that emerging depressive symptoms may be a better predictor than persistent depressive symptoms. This prospective study of 3,700 men and women age>70 measured depressive symptomatology 3 times (Center for Epidemiologic Studies-Depression Scale) during a 6-year period to distinguish persons who were newly (depressed at baseline but not 3 to 6 years before) and chronically depressed (depressed at baseline and 3 to 6 years before). Their risk of subsequent CVD events and all-cause mortality was compared with that of subjects who were never depressed during the 6-year period. Outcome events were based on death certificates and Medicare hospitalization records. During a median follow-up of 4.0 years, there were 732 deaths and 933 new CVD events. In men, but not in women, newly depressed mood was associated with a RR of CVD mortality of 1.75 (95% CI 1.0 to 3.05), for new CVD events 2.07 (95% CI 1.44 to 2.96), and for new CAD events 2.03 (95% CI 1.28 to 3.24) after adjustment for standard conventional CVD risk factors. The association between newly depressed mood and all-cause mortality was smaller – RR 1.40 (CI 0.95 to 2.07). Chronic depressed mood was not associated with new CVD events or all-cause mortality. Newly depressed older men, but not women, were at twice the risk for having a CVD event vs. those who were never depressed. In men, recent onset of depressed mood is a better predictor of CVD than long-term depressed mood.

20. Cardiac events/stress reduction (20).

   107 patients with CAD and ischemia shown during mental stress testing or ambulatory EKG monitoring were randomly assigned to stress management training, physical exercise or to standard medical treatment (controls) for 4 months. 22 cardiac events (death, recurrent MI, acute ischemia) occurred over 38 months of follow up. The stress management included sixteen 1.5 hour sessions of cognitive education with graded task assignments of monitoring irrational internal autonomic thoughts, generating alternative interpretations of situations and unrealistic thoughts, progressive relaxation and more than 2 sessions of EMG biofeedback. The physical exercise group warmed up 3 times/wk for 16 weeks with 10 minutes of aerobic activity at 50% to 70% of absolute heart rate reserve followed by 35 minutes of jogging at a target intensity of 70% to 80% of heart rate reserve. After adjustment for all confounders, the RR for cardiac events in the stress management group was .26 (p=.04)versus controls and the exercise group RR was .68 v. controls (NS). The stress management group experienced weight loss (p=.02) and decreased severe ventricular wall movement (p less than .004). In the exercise group, treadmill time increased (p less than .001), resting DBP fell and oxygen consumption/unit of time rose (both p=.01) and weight loss was greater (p less than .001).

21. Coronary angioplasty restenosis/hostility (21).

9/15 (56%) patients experiencing restenosis of angioplasty sites had high hostility scores on interview compared to 7/26 (44%) not experiencing restenosis. The RR for restenosis in high hostility patients compared to those with low hostility was 2.5 (95% CI 1.03 to 5.32). The total potential for high hostility scores was highly correlated with the number of arteries restenosed (p=.01). Males more than females had a greater potential for hostility and restenosis (RR2.09, p=.037).

22. Cardiovascular mortality/depression (22).

10,300 men and women from Massachusetts, Connecticut, and Iowa were followed between 1982 and 1988 as part of the Established Populations for Epidemiological Studies of the Elderly trials. Rate of Stroke were 2.3 to 2.7-fold higher in most subgroups with high depression compared to their non-depressed counterparts, after adjustment for site, age, gender and baseline health status (p less than .001 to .05). It also concluded that high levels of depression places patients with diagnosed hypertension at increased risk for stroke in the Iowa cohort (p less than .001) but not in the Massachusetts and Connecticut groups (p less than .001). Rates of cardiovascular death were also elevated in most subgroups.

23. Cardiac disease/comprehensive rehabilitation (23).

Of 40 men hospitalized with myocardial infarction, 20 were randomly assigned to cardiac education and 20 to stress management training. Six-month follow up revealed differences in outcomes. The education group had one individual session followed by 8 group sessions of 2 to 6 patients each. The process involved didactic teaching about coronary artery disease, physical expectations, changing health habits (blood pressure monitoring, smoking, exercise, diet and weight management), and one session teaching about the role of stress without any skills practice. The stress management group included four sessions of instruction and practice in Jacobsen Progressive Relaxation, with advice for b.i.d. practice between sessions; the last four sessions telescoped the Progressive Relaxation muscle groups from 16 combined into 7, incorporated teaching about the recognition and handling of stress and emphasized continued relaxation practice. In 6 months, there were 4 deaths in the education group v. one in the stress management group (NS); and, respectively, more arrhythmias (p than .05), more chest pain (11 vs. 5 days, NS); more reinfarctions (4 vs. 2, NS); "stable status" (5 vs. 13, p less than .05); symptoms with effort (4 vs. 0, NS); and "practicing relaxation at home" (1 vs. 11, p less than .001). When asked "What do you remember from your hospitalization experience which was supposed to help you in recovery?" the numbers were: 9 v. 2 for "nothing special" (p less than .01); 1 vs. 13 for "watch for stress" (p less than .001). Responses to "When stress occurs do you: 'think about your health?'" 1 vs. 8 (p less than .05); "talk with someone who cares?" 0 vs. 7 (p less than .05); "go to sleep/lie down/watch TV?" 9 vs. 2 (p less than .01). The questions about "following a diet?" brought insignificant differences: 7 vs. 10 (NS); "exercising?" 6 vs. 11 (NS); "unable to work because of your heart?" 5 vs. 0 (p less than .01). Didactic education is ineffective compared to experiential teaching.

24. Cardiac recovery/optimism (24).

51 men recovering from coronary artery bypass graft surgery provided psychological information one day prior to surgery, 5 to 8 days post-op and 5 months later. Dispositional optimism assessed before surgery correlated positively with manifestation of problem-focused coping and negatively with denial. Optimists were significantly less likely to develop new Q waves after surgery (p less than .01); less likely to have high AST (transaminase) values after surgery (p less than .05); experienced fewer days before beginning walking (p less than .02); requested more information (p less than .005); had significantly less hostility the day prior to surgery (p less than .005); returned to sexual activity sooner (p less than .001); were more likely at 6 months to have returned to vigorous physical activity (p less than .02); and global assessment of progress found them returning sooner to elements of a quality life at 5 months (p less than .02).

25. Sudden cardiac death/stress (25).

    4,000 men with no prior clinical symptoms of ischemic heart disease, an excess proportion of sudden cardiac deaths occurred on Mondays compared to the other six days of the week (p less than .01). For men with known cardiac disease, this relationship of excess risk of sudden death to Mondays was not apparent.

26. Cardiac Surgery Hospitalization/Guided Imagery (26).

    Guided imagery has a significant and positive impact on pre and post-op anxiety, pain, and length of stay in patients undergoing elective cardiovascular surgery.

27. Coronary artery disease/depression (27).

    Literature and folk wisdom have long linked depression and death; however, only recently have scientific studies examined the relation between them. Beginning in the 1970s, investigators compared mortality among patients treated for major depression and the general population. 9/10 studies found an increased mortality from cardiovascular disease among depressed patients. However, such studies confound the relation between depression and its treatment. Community surveys circumvent this difficulty, but as these studies began to appear, other investigations revealed the strong association between depression and cigarette smoking, which made obvious a need to control for smoking. The first study to do this appeared in 1993, and not only did a relation between depression and mortality persist, but a relation between depression and the development of ischemic disease was revealed. In the past 2 years, 6 more community surveys have followed populations initially free of disease, and 5 have observed an increased risk of ischemic heart disease among depressed persons. Depression has also consistently been associated with a worse outcome in subjects who have preexisting cardiovascular disease. In one well-designed study, patients with depression in the period immediately after a myocardial infarction were 3.5 times more likely to die than nondepressed patients. It is likely that the changes in the autonomic nervous system and platelets that are seen in depression account for a substantial portion of the association.

28. Coronary artery disease/exercise frequency (28).

The Harvard Physicians Health Study had concluded that 1-2 exercise workouts/week reduce CAD risk 28%, 3 to 4 times per week 34% and greater than 5 times per week 44%. 716 nonfatal and 297 fatal MIs occurred in 22,000 physicians between 1982 and 1994. Workout length greater than 25 minutes showed no incremental benefits. Number of workouts appeared to be more predictive than the length of workouts.

29. Coronary artery disease/lifestyle changes (29).

35 of 48 original patients in the Lifestyle Heart Trial completed evaluation at 5 years. 20/28 experimental group patients (10% fat, whole foods, vegetarian diet, aerobic exercise, stress management training, group psycho-social support) made comprehensive lifestyle changes v. 15/20 control group patients made modest changes. Mean absolute percent diameter decrease from baseline was 3.1 in the experimental group (7.9% relative improvement) v. and increase of 11.8 absolute percentage points in controls (27.7% relative worsening) at five years (p=.001). Cardiac events totaled 25 for 38 in the experimental group v. 45 in 20 controls over five years (RR for events in controls 2.47, 95% CI 1.48 to 4.20). The success was related to the degree of adherence to the program (p=.04). Deaths and MI differences were insignificant; angioplasty was lower (p less than .05), cardiac hospitalizations and risk of any event very much lower (p less than .001) in the experimental group/5 years. Cholesterol, LKL-C, HDL-C were insignificantly lower in the experimental group, apolipoprotein A-1 was lower (p=.04) and triglycerides and apolipoprotein B were insignificantly higher; weight loss was significantly better (p=.001).

30. Coronary artery disease/psychosocial interventions (30).

These authors completed a meta-analysis of 23 randomized controlled trials of 3,200 subjects with coronary artery disease, encompassing 2,204 patients experiencing psychosocial interventions and 1,156 controls treated by "routine" care only. Controls showed increased risk of mortality in more than 2 years of follow-up with OR (odds ratio) 1.7 (95% CI 1.09 to 2.64); OR was 1.84 for recurrence of cardiovascular events (95% CI 1.12 to 2.99). The 95% CI is the confidence interval equal to or greater than the accepted cut-off for significance (p less than .05). Benefits were found in reductions in physiological distress in the treatment groups (p less than .001) compared to controls; reductions in systolic blood pressure (p less than .05), heart rate (p less than .01) and cholesterol (p less than .01).

31. Coronary artery disease/depression (31).

1,250 patients with established coronary artery disease were assessed for depression with the Zung Self-rated Depression Scale. Follow-up was as much as 19.7 years. Higher SDS scores were associated with increased risk of cardiac death (p=.002) and all-cause mortality (p less than .001) after controlling for initial disease severity and treatment. Those with moderate to severe depression had an OR (odds ratio) of 1.69 for a heart death and an OR for death from any cause of 1.76 compared to non-depressed patients. The risk for cardiac death remained high more than 5 years after the coronary event (p less than .005). The OR for cardiac death in the moderate/high depression group 5 to 10 years after the coronary event was 1.84, and after 10 years 1.72.

32. Coronary artery disease/rehabilitation exercise in disabled parsons (32).

    88 men aged 42 to 72 who had suffered an MI and who had a physical disability were randomized to a group of 41 who performed home exercise training or to a group of 47 given only routine care for 6 months. Men in the exercise group were required to have the use of more than 2 extremities and more than one arm. They were provided with a wheelchair ramp to transform their wheelchair into a stationary wheelchair ergometer. They exercised for 20 minutes/day fife days/week. Men in the treatment group compared to the routine group had better peak ejection fractions (p=.007) and decreased resting cardiac rates six months later (p=.03).

33. Coronary artery disease, longevity, diabetes/aerobic exercise v. strength training (33).

    Physical inactivity is an independent risk factor for CAD equal in importance to smoking, hypertension and hypercholesterolemia. For CAD, aerobic exercise is of greatest importance. Intensity needs to be at 60% of maximum capacity to improve cardiovascular function. However, there are longevity benefits from activities such as gardening as well as from aerobic exercise. Resistance (strength) training raises catecholamine levels in which increased noradrenalin causes tachycardia, but not an increased oxygen consumption. It is the later which correlates with cardiovascular benefit. Aerobic exercise and strength training exhibit equivalent effects on glucose metabolism in increasing insulin sensitivity increases insulin receptor sites.

34. Coronary artery disease/psychotherapy (34).

    This reviews the effectiveness of creative novation behavior therapy in preventing cancer and coronary heart disease in disease-prone probands, and also its effectiveness in extending life for patients suffering from terminal cancer. In all cases, suitable matched controls were part of the general methodology, and results reported to testify to the effectiveness of the therapy, whether administered a long-term individual therapy, group therapy, or bibliotherapy plus short-term individual treatment. The authors also report the negative effects of psychoanalysis on outcome.

35. Coronary artery disease/emotions-stress (35).

    The reactions to stress are anxiety and anger. 7 aspects of such reactions are statistically related to heart disease: the potential for hostility; becoming angry one or more times/week; expressing anger; irritability at waiting in line; explosive voice; vigorous expression; and competitiveness in games.

36. Coronary artery disease/anxiety (36).

    The emotion of "severe anxiety" expressed in one or more of the prior tests taken by 116 students while in college carried a RR for coronary artery disease susceptibility of 2.5 in adult life compared to those with no severe anxieties (p less than .01) In patients with coronary artery disease, the prior history of having expressed severe anxiety in college was 2.5-fold greater than having expressed feelings of not having severe anxiety. This form of pathological anxiety was frequently linked to marked conflict about hostile impulses.

Contrarily, neither anger-in nor anger-out was found to be associated with a higher incidence of subsequent disease. Failure to express emotion was observed in a variety of subjects who as a group exhibited no predisposition to sickness in later life. Psychological Mastery was predictive of favorable prognosis, and Physiological Mastery, contrary to expectations, did not show statistically significant advantages in that regard. Cardiovascular hyper-reactivity could not be confirmed as a major biologic mechanism responsible for cardiovascular disease. Such hyper-responses were common in association with "anger-in" without evidence of increased susceptibility to cardiovascular disease or other forms of illness.

37. Coronary artery disease/childhood socioeconomic status (37).

   More data from the Kuopio, Finland Study. Retrospective description of childhood socioeconomic status was significantly linked to the risk for adult ischemic heart disease. The adjusted OR for ischemic heard disease on treadmill testing in the highest tertile of low socioeconomic status in childhood compared to the middle tertile was 1.44 (95% CI 1.17 to 1.78) and the lowest tertile 1.35 (95% CI 1.12 to 1.64). Levels of conventional risk factors at middle age did not account for this association.

38. Coronary artery disease/childhood family conditions (38).

   1,500 men recruited from cohorts of ages 42, 48, 54, and 60 in the Kuopio, Finland, Heart Study were assessed for detailed descriptions of their childhood circumstances. Six socioeconomic items turned out to be highly related to ischemic heart disease risks: level of father's education; father's occupational prestige; mother's occupational prestige; having live on a farm; the size of the farm; and self-perceptions of poverty/wealth. The relative risk for ischemic disease was 1.44 in the lowest tertile of socioeconomic circumstances, and 1.35 for the middle tertile compared to the highest tertile. Adjusting for all other identifiable cardiovascular risk factors diminished the strength of the association by 16%.

39. Coronary artery disease/hostility (39).

   192 cases involving a major CAD event (death or MI) were compared to 384 matched controls in the MRFIT study. The presence of the attitude of hostility was rated by voice characteristics, verbal mannerisms and clinical assessment. Stylistic hostility was significantly associated with CAD events (p=.01).

40. Coronary artery disease/hostility (40).

   In 53 CAD patients 18 to 26, high and low hostility groups determined by Ho MMPI scores were studied for reactions to harassment. The high hostility group was formed from 26 who had Ho scores greater than 23 and the low hostility group from 27 whose scores were less than14. Both were then randomly divided into 2 comparative cohorts, the first of which was deliberately harassed during the testing procedure and the second of which was not. Forearm blood flow response, SBP and DBP were all significantly higher in the high hostility-harassed group compared to the high hostility non-harassed and low hostility-harassed and low hostility-non-harassed group (p less than .05). Performance during testing was significantly worse in this same group (p less than .01). These men also demonstrated poor

recovery (p less than .05) and manifested a significant correlation with anger, (p less than .0001), tension (p less than .005), and irritation (p less than .008) vs. the other three groups.

41. Coronary artery disease/isolation (41).

150 men followed for 10 years included some with ischemic heart disease, some with risk factors for IHD and some without risk factors for IHD. Social factors assessed by standard questionnaires included education, social class, marital status, assessment of ADLs, and self-assessed health ratings. 37 subjects died, 20 from IHD. Mortality was predicted by increased age, decreased education, lower social class, increased SBP, increased ventricular irritability, cardiac enlargement, poor self-rated health and increased social isolation (decreased social interactivity level). Equally strong predictors for mortality were: social isolation, decreased self rated status (both p less than .01), ventricular irritability (p less than .001), decreased education, increased age and lower social class (all p less than .05) v. survivors. Decreased social/recreational activity in men with existing IHD was significantly predictive of mortality at (p less than .05); in healthy men with IHD risk factors the significance was even greater, (p less than .01), and in healthy men without risk factors, social/recreational activity was not significant as predictors of future problems.

42. Coronary artery disease, rheumatoid arthritis, low back pain/education (42).

Attained educational level is clearly a variable related to etiology and outcomes in CAD, RA and low back pain. 9-year survival after MI was significantly better in the more highly educated (p less than .01). Risk of dying following recover from an MI for those with greater than 12th grade education was 5.5 compared to 13 for those with less than 10th grade education (p less than .001). Having attained greater than a 12th grade education lowers mortality risk following recovery from an MI more than being treated with propranalol. In 9 years of follow up, morbidity and mortality in RA is substantially less in the better educated. OR for incidence of these 3 illnesses vary from 3:1 with greater than 12 years of education to 6:1 with less than 9 years education.

43. Coronary artery disease/depression (43).

52 patients were given structured psychiatric interviews before undergoing cardiac catheterization and being found to have significant CAD. 7 of 9 meeting DSM III criteria for major depressive disorder (78%) experienced a major CAD event in the ensuing year (MI, CABG, angioplasty or death) compared to 15 of 43 who were not depressed (35%) (p less than .02). The significant predictive effect of depression for a major CAD event was independent of the severity of the CAD, LVEF and the presence/absence of smoking. Depression was the best predictor of major heart problems in the following year.

44. Coronary artery disease/hostility (44).

1,877 Western Electric men, free of cardiovascular disease, completed a 50-item MMPI hostility subscale (Ho). The 10-year incidence of major CAD events (death, MI) was lowest in the 1st quintile (lowest hostility and highest in the middle quintile. The RR for major cardiac events was .68 in men whose Ho score was greater than 10 vs. 1.0 in men whose score was greater than 10 (p=.004).

45. Coronary artery disease/hostility (45).

424 patients having a diagnostic angiogram for suspected CAD completed an MMPI, from which an Ho scale was used to separate them into a high hostility group (scores greater than 10) and low hostility group (scores less than 10). The high hostility subjects had a significantly greater chance of finding more than 1 blocked artery with more than 75% stenosis (71% vs. 56% p less than .01). Only 48% of patients with low hostility had a significant stenosis vs. 70% in the high hostility patients. At each level of hostility, type As had a consistently greater percentage with at least one occluded artery compared to non-type As. The identifying difference appeared to be a much more judgmental attitude in the high hostility group leading them to conclude that other persons are inconsiderate, immoral, selfish and exploitative, and deserved to be punished.

46. Myocardial infarction/exertion (46).

The exercise and exertion history of 1228 patients interviewed after acute MI was compared to that of 218 controls. Heavy v. moderate-light physical exertion in the hour prior to the event incurred a 5.9 RR for an MI (95% CI 4.6 to 7.7). Among people who usually exercised less than one, 1 to 2, 3 to 4, or greater than 5 times per week, the respective RRs for MI of heavy vs. moderate-light exercise were 107 (95% CI 67 to 171), 19.4 (9.9 to 38.1), 8.6 (3.6 to 20.5), and 2.4 (1.5 to 3.7). Regular l-5xlweek exercise protects against the risk of heart attack shortly after marked exertion.

47. Myocardial infarction, stroke (47).

In the 84,000-woman Harvard Nurses Study, 10-year follow up of self-reported exercise histories found that those in the uppermost quintile for brisk walking greater than 3 miles per hour incurred a RR for CAD and stroke of .46 compared to the sedentary quintile. Women walking at less than 3 mph had a RR of .68.

48. Myocardial infarction/grief (48).

1,200 men and 540 women were interviewed within a week after an acute myocardial infarction. A significant relationship to the antecedent death of a loved one (including spouse, sibling, parent, child, grandchild, grandparent, in-law, other close relatives or close friends) was found in the data. The RR (relative risk) of MI in the first 24 hours after the loss of a loved one was 14.0; in the second 24 hours, 8.0; in the third 24 hours, 6.0; and over the ensuing month, 2.0 to 4.0.

49. Myocardial infarction/stress (49).

The incidence of myocardial infarction is 3-fold higher at the hour of 9 a.m. compared to 11 p.m. (p less than .01).

50. Myocardial infarction/stress (50).

Statistics show a 2-fold higher incidence in sudden death at 9 a.m. compared to 5 a.m. and a 2-fold higher incidence of strokes at 8 a.m. to 9 a.m. compared to 3 a.m. to 4 a.m.

51. Myocardial infarction/stress (51).

Out-patient sudden cardiac deaths in 1983 in Massachusetts were disproportionately represented on Mondays 7 a.m. to 11 a.m. (p less than .001).

52. Myocardial infarction/occupational stress (52).

Review: 6 separate studies have found a strong relationship between work stress and increased risk for CAD and MI.

53. Myocardial infarction/stress (53).

Most threatening arrhythmias occurred on Mondays in a study of 683 retired patients. Precise information was garnered from implanted defibrillators with event recorders. There was a significant non-uniformity to the daily distribution of threatening arrhythmias, sudden death and myocardial infarcts (p less than .001) with the major peak on Mondays and a secondary peak later in the week centered around Thursdays. Apparently the pattern of greater stress reactivity on Mondays in the work years is repeated in retirement years, perhaps due to conditioning.

54. Myocardial infarction, illness/stress (54).

A schedule of recent events questionnaire updated and modified from the Holmes-Rahe 1967 landmark Paper is presented. In one study, a mean LCU (Life Change Units) of 130 was highly correlated with subsequent minor illness and a mean of 164 was highly correlated with subsequent major illness (p less than .001) compared to the mean for all subjects (72 LCU). In a second study LCU totals rank-ordered and compared to the number of illness episodes recorded by "blind" health practitioners yielded a correlation coefficient of .12 (p less than .001). A Finnish study of several hundred myocardial infarction patients reported a level of stress points 50% to 100% higher 0 to 6 months prior to infarction compared to an identical 6 to month period a year earlier (p less than .005). Those dying suddenly of CAD events had experienced a rise of 100% to 200% in the prior 6 months compared to an identical 6-month period a year earlier (p less than .005).

55. Myocardial ischemia/stress (55).

126 persons, mean age 59, with documented coronary artery disease and exercise ischemia underwent exercise testing and stress testing. The stress testing involved performing mental arithmetic; giving one minute public speaking presentation with one minute of preparation; tracing a star outline from a mirror image; being subjected to a type A behavior interview; and reading an unfamiliar book passage out loud. Immediately following the physical testing and immediately following the stress testing, radionuclide ventriculography was performed. 22% of subjects experienced an acute cardiac event in the ensuing year. The RR for a cardiac

event with an enhanced ischemic RNV (2.8, p less than .05*)* compared to a non-enhanced RNV. LVEF change during stress was significantly related to event-free survival (RR 2.4, p=.02). RR for a cardiac event from an EKG-defined ischemia was only 1.9 (p=.07), and RR for ambulatory ECG ischemia predicting an event was .75 (p=.47). The best predictor for a cardiac event in CAD patients with ischemia was the enhanced ischemic evidence of poor adaptation under stress.

56. Myocardial infarction/aggression and hostility (56).

862 men who had suffered a first heart attack were enrolled in the Recurrent Coronary Prevention Project within 6 months of their MI. 270 were randomized to enroll in a cardiac education group for 1.5 hours/month, and 592 in small group therapy for 1.5 hours every other week for a year, followed by 1.5 hours monthly. The emphasis in the latter group was on recognition of signs and symptoms of anger, irritation, aggravation, impatience and physical signs of arousal and the practice of changed behaviors in that regard. The techniques utilized included behavioral self-management, and group and therapist support. In 8 years of followup, 8.2% of the cardiac information group died versus 5.8 % of the comprehensive therapy group. Those who at the outset were the most hostile and aggressive experienced the highest rate of second heart attacks. At 8 years, in the 2 groups, self-rated efficacy scores were 4.6 vs. 1.94 respectively (p less than .001); the Novaco Anger scores were .13 vs. .62 (p less than .001); and reduction in self-reported depression 2.41 vs. 1.34 (p less than .001). Observational estimates of the following decreased significantly: type A behavior, hostility, time urgency, impatience (all p less than .001), physical signs (p less than .0 1) and sense of well-being improved (p less than .0 1).

57. Myocardial infarction/optimism-pessimism (57).

Of 122 men experiencing their first MI, their optimist/pessimist attitudes were evaluated. Of the 25 most pessimistic, 21 were deceased at the end of 8 years; of the *25* most optimistic, only 6 were deceased.

58. Myocardial infarction/depression (58).

80 of 552 male myocardial infarction patients manifested persistent depression. Significant relationships were found predictive of depression after infarction, including serious arrhythmias early in the course of the MI (p less than .034); recurrent infarction (p less than .001); dyspnea (p less than .000 1), persistent angina (p less than .000); significant chest pain for greater than 1 year compared to less than 1 month (p less than .000 1); stressful personal life events (p less than .032); stressful occupational life events (p less than .048); denial (.001); and exhaustion and fatigue (p less than .0001), all before the infarction. Fatigue and exhaustion had the strongest relationship.

59. Myocardial infarction/depression (59).

One week post-myocardial infarction, 222 hospitalized patients completed the Beck Depression Inventory (BDI) and the NIH Diagnostic Interview Schedule (DIS). 68 had BDI scores greater than 10 and 35 met the criteria for major depression on the DIS. Over the next

6 months, the RR for dying was 5.7 in the depressed group compared to the group not depressed (p.0006).

60. Myocardial infarction/depression (60).

In a Mayo Clinic study of 380 patients with CAD, those manifesting psychological stress upon entering a cardiac rehabilitation program had a RR of 3.5 for a subsequent cardiac event in the following 24 months compared to those not under stress. Approximate figures suggest that 12,000 deaths occur yearly among depressed patients who survive a first MI.

61. Myocardial infarction/depression (61).

Within one week post-myocardial infarction, 222 hospitalized patients completed the Beck Depression Inventory (BDI) and the NIMH Diagnostic Interview Schedule (DIS). 68 had BDI scores greater than 10 and 35 met the criteria for major depression on the DIS. Over the next 18 months, 19 of the depressed patients died. For 12 dying within 6 months, the scores on the NIMH Diagnostic Interview Schedule predicted mortality with a hazard ratio of 5.74 (p less than .0006). After controlling for premature ventricular contractions, Killip class and previous MI, the OR (odds ratio) for mortality within 18 months among those with high BDI scores and major depression on the 015 was 6.64 (.0026) compared to those not depressed. For those who were both depressed and had greater than 10 premature contractions/hour during recovery, the OR for dying in 18 months was 6.97 (p less than .00001). Post-myocardial depression is a major predictor of mortality within 18 months.

62. Myocardial infarction/depression (62).

409 Danish men and 321 women, born in 1914, underwent physical and psychological examinations in 1964 and 1974, establishing their cardiovascular baseline risk factors, disease status and level of depression. Initial myocardial infarction was observed in 122 participants, and there were 290 deaths during follow-up, which ended in 1991. A 2-SD difference in depression score was associated with RR of 1.7 (p less than .005) for MI and 1.6 (p less than .001) for all-cause mortality. These findings were unchanged after controlling for risk factors and signs of disease at baseline. There were no sex differences. High levels of depression were associated with increased risks of MI and mortality. The progressive relationship between depression scores and risk, the long-lasting nature of the effect, and stability of the depression measured across time suggest that this risk factor is best viewed as a continuous variable that represents a chronic psychological characteristic rather than a discrete and episodic psychiatric condition.

63. Myocardial infarction/depression (63).

Secondary analysis was performed on data from two studies that used the Beck Depression Inventory (BDI) to assess depression symptoms during hospitalization: a prospective study of post-MI risk and a randomized trial of psychosocial intervention (control group only). The sample included 613 men and 283 women who survived a heart attack to be discharged from the hospital and receive usual post-hospital care. Multivariate logistic regression analysis was used to assess the risk of 1-year cardiac mortality associated with baseline BDI scores. There were 157 men and 133 women with BDI scores _l0 (greater than mild-moderate symptoms of

depression); 8.3% of the depressed women died of cardiac causes v. 2.7% of the nondepressed. For depressed men, the rate of cardiac death was 7.0% vs. 2.4% of the nondepressed. Increased BDI scores were significantly related to cardiac mortality for both genders (OR for women was 329 [95% CI 1.02 to 10.59]*); for men, the OR was 3.05 (95% CI 129 to 7.17). Control for other multivariate predictors of mortality (age, Killip class, the interactions of gender by non-Q wave MI, gender by left ventricular ejection fraction, and gender by smoking) did not change the impact of the BDI for either gender. Depression in hospital after MI is a significant predictor of 1-year cardiac mortality for women as well as for men, and its impact is largely independent of other post-MI risks. Previous studies have found this relationship in men; this study confirms similar relationships in women. The greater than 3-fold excessive risk for dying in both women and men who were depressed is greater than most of the other more conventionally recognized risk factors for death after myocardial infarction. The depression factor is still far from being recognized in conventional circles of medicine.

64. Myocardial infarction/grief (48).

1,200 men and 540 women were interviewed within a week after an acute myocardial infarction. A significant relationship to the antecedent death of a loved one (including spouse, sibling, parent, child, grandchild, grandparent, in-law, other close relatives or close friends) was found in the data. The RR (relative risk) of MI in the first 24 hours after the loss of a loved one was 14.0; in the second 24 hours, 8.0; in the third 24 hours, 6.0, and over the ensuing month, 2.0 to 4.0.

65. Myocardial infarction/anger (64).

1,623 patients including 501 women were interviewed within 4 days of having a myocardial infarction. A history of the frequency of experiencing anger in the previous year and the intensity and timing of anger in the 26 hours prior to infarction was obtained. Patients completed the Onset Anger Scale and the anger subscale of the State-Trait-Personal Inventory. RR of having a myocardial infarct within 2 hours of an anger episode (using the previous year as a comparison) was 2.3 (95% CI 1.7 to 3.2). High scores on the anger scale of the Personal Inventory predicted an RR of 1.9 (95% CI 1.3 to 2.7). Being angry more than doubled the risk of heart attack in people who already had heart disease; the heightened risk lasted for some two hours after the anger was aroused.

66. Myocardial infarction/prayer (65).

Of 400 patients admitted to a CCU with suspected MI, one-half selected at random were prayed for by organized prayer groups across the US; a control group was not prayed for. Patients and staff were blinded. Of 17 evaluative categories, significant overall differences emerged (p less than .000 1). All favored the prayer group; of these, 6 were statistically significant: deaths 0 vs. 3, CPR incidents 3 v. 14 (p less than $.O^2$), mechanical ventilation 0 vs. 14 (p less than .002), congestive heart failure 8 v. 20, need for diuretics (p less than .05) and need for antibiotics 3 vs. 16 (p less than .OOS). Duration of hospitalization and mean time spent in the CCU were similar.

67. Myocardial infarction/education (66).

Among 1,739 men surviving greater than 3 years after MI who had had complex ventricular premature beats during an hour of deliberate monitoring while hospitalized, the RR for sudden coronary death was greater than 3.0 in those with less than 8 years of formal education compared to 1.0 for those with greater than 9 years of education (p less than .01).

68. Myocardial infarction/education, isolation, and stress (67).

In 2,320 male survivors of acute MI, 3-year risk of dying was significantly higher in stressed, isolated and low educated groups (p less than .001). Mortality in the group with low levels of both stress and isolation: 2.5% (4%, 3.7% and 2.2% for greater than a 10th grade education, 10 to 12th grade education and greater than 12th grade education, respectively); mortality in the group with high levels of stress or isolation: 8.0% (13%, 9% and 6% for the 3 education levels); mortality in the group with high levels of both stress and isolation factors: 15% (16%, 15.5%, 11%). The differences in high and low categories in all comparisons were significant at the p less than .001 level.

69. Myocardial infarction/social support (68).

In 120 men and 40 women undergoing coronary angiography for chest symptoms, the RR for discovery of ASCVD with low levels of support was 1.74 vs. 1.5 for those with high support. As an element of social support, the perception of being loved was much more important than the size of the support network (p.02).

70. Myocardial infarction/emotional support (69).

Review of 34 controlled studies. Surgical or coronary patients who are provided information and/or emotional support to help master the medical crisis do better than patients with "usual care." Thirteen studies using hospital stay as an outcome measure found that psychological intervention providing patient information and support shortened the hospital stay of the usual care group (mean 9.92 days) by two full days. Psychological care is not only humane but cost effective.

71. Myocardial infarction/confidant, income (70).

1,368 medically treated CAD patients with greater than 75% stenosis were studied for survival compared to income and companionship. In those greater than 40 years of age, 5-year survival was .91 for the greater than $40,000 income/year group compared to .76 for the greater than $10,000/year group (p less than .002). For men who were married, had a confidant, or were married and had a confidant as well, S-year survival was .82 compared to .50 in those who were unmarried or without a confidant (p less than.0001).

72. Myocardial infarction/emotional support (71).

Of 194 patients in the original Alameda County Study (72) who suffered myocardial infarctions, 39 died during 6 months of follow up. 21/39 had no one whom they could count on for emotional support; 14/39 had one person, and 4/39 had 2 or more persons. The RR of

dying in the 0 emotional support group was 2.9 compared to those in the greater than 1 support person group (P=.02). The global mortality risk was 2.3 for men in the most socially isolated groups compared to the most socially integrated, and 2.8 for women.

Cholesterol

1. Hyperlipidemia (73).

   21 volunteers age 18 to 22 were randomized to be controls or subjects who performed stair climbing exercise for 7 weeks, beginning with one ascent/day and culminating in 7 ascents/day, spending 135 seconds each time. VO 2max increased 11% (p less than .018), time-to-exhaustion increased 8% (p less than .0005), HDL increased 5% (p less than .05) and chol/HDL ratio decreased 12% (p less than .0027). 2.25 minutes of daily exercise is manageable for everyone if they choose to do it.

2. Cholesterol, lipids/fitness (74).

   The VO 2max of 330 healthy senior Army officers, as an index of fitness, was positively related to HDL-C (p=.0004) and inversely related to triglycerides (p=.036).

3. Cholesterol/exercise (75).

   Of 553 men and 166 women completing a five-year aerobic exercise program, cholesterol/HDL ratios decreased from 6.3 to 5.4 and 5.6 to 3.5 respectively. HDL-Cs increased from 36.7 to 40.4 and from 46.7 to 56.1 mg/dl respectively and total cholesterols dropped from 214 to 196 and from 239 to 193, respectively. Women's HDL-Cs continued to increase through the 5 years of the follow up, but men's increases were essentially only initial (p=.03 for difference). LDL-Cs dropped 34% in women versus 15% in men (p=.0001 for difference).

4. Cholesterol, lipid factors/marital status, women (76).

   Blood lipids were determined in 351 healthy women employed in an Israeli industry. 87 former spouses were each matched to 3 married women for age, number of children, smoking status, and white/blue collar job description. Additionally controlling for coffee consumption, seisure-sport activity and number of cigarettes/day, in the more than 45 age group, serum cholesterol (p less than .05), cholesterol/HDL-C ratio (p less than .05), LDL (p less than .05) and triglyceride (p less than .05) levels were all significantly higher in the single subjects than the levels in married counterparts. No differences emerged for women greater than 45.

5. Lipids, blood viscosity/stress (77).

   44 young adult volunteers were randomly assigned to perform deliberately frustrating cognitive tasks for 20 minutes or sit quietly for 20 minutes. Compared to baseline, the mean changes in the stressed group included increase in: SBP of 10 mmHG and DBP of 6 mmHg (p less than .001), pulse rate of 13/min (p less than .001), cholesterol, LDL-C (p less than .01), total plasma proteins (p less than .01), plasma viscosity (p=.05), whole blood viscosity

(p less than .001), and a decrease in plasma volume (p less than .001). Hematocrit and hemoglobin concentrations also significantly increased due to the increased hemoconcentration. Quietly sitting controls showed no significant changes. Many of these factors contribute to known risks for cardiovascular disease.

6. Cholesterol (78).

    Depression on the Beck Depression Inventory, cholesterol and weight of 1,020 men 50 to 89 were measured. The depression scores were inversely correlated with serum cholesterols. In men over 70, depression was 3-fold more common in those with low cholesterol (16%) compared to those with higher concentrations (6%, p less than .033).

7. Cholesterol/meditation (79).

    44 drug-free subjects were entered into a study of meditation with determination of baseline cholesterols and blood pressures which were normal to slightly elevated. 23 were assigned to the Transcendental Mediation group and 21 to the control group. After 10 months, fasting cholesterols dropped from 234 to 205 mg% in the intervention group versus 231 to 228 mg% in controls (p less than .001) and systolic blood pressures dropped from 126 mmHg to 119 mmHg v. 124 mmHg to 123 mmHg respectively (p less than .05) and DBP (diastolic blood pressure) dropped from 83 mmHg to 78 mmHg v. 83 mmHg to 84 mmHg respectively (p less than .001).

Congestive Heart Failure

1. Congestive heart failure/exercise (80).

    The effect of exercise training on quality of life and exercise capacity was studied in 67 patients (mean age 66 yrs and mean left ventricular ejection fraction: 26.5%) with mild to moderate chronic heart failure. Patients were randomly allocated to either a training group or to a control group. After participating in an exercise program for 12 weeks, a significantly larger decrease in Feelings of Being Disabled (a subscale of the Heart Patients Psychological Questionnaire) (p less than .042), and a significantly larger increase in the Self-Assessment of General Well-Being (SAGWB) (p less than .0000) were observed in the training group. Exercise duration and anaerobic threshold were increased in the training group only (p less than .001). The increase in exercise time was related to both Feelings of Being Disabled and SAGWB. Supervised exercise training improved both quality of life and exercise capacity and can be safely performed by congestive heart failure patients.

2. Congestive heart failure/stress (81).

    Specific "triggers," such as intense psychological stress, may precipitate MI and sudden death. Muscle sympathetic nerve activity, heart rate, mean arterial pressure, forearm blood flow, and renal blood flow were measured during mental stress testing with mental arithmetic and Stroop color word test in 27 patients with CHF, NYHA class III or IV, and 26 age-matched healthy controls. CHF patients had increased resting muscle sympathetic nerve activity and heart rate in both patients with CHF and controls, although the magnitude of increases tended to be blunted in patients with CHF. Nevertheless, absolute levels of

sympathetic activity in patients with heart failure remained significantly higher than levels in controls during mental stress. The decrease in renal blood flow in CHF patients was similar to that of controls, despite greater resting renal vasoconstriction. The increase in forearm blood flow during mental stress testing in patients with heart failure was blunted compared to that of control subjects. Patients with CHF do not have augmented muscle sympathetic nerve activity responses to mental stress, despite elevated resting levels of sympathetic activity, but they do have markedly higher absolute levels of sympathetic nerve activity during mental stress as well as at rest which contributes to a higher risk of mortality. This higher level of sympathetic resting activity can be modified with behavioral methods including biofeedback and meditation.

3. Congestive heart failure/biofeedback (82).

    40 patients with congestive heart failure were randomized to a control group or to an intervention group engaging in one session of thermal biofeedback augmented by imagery of hand warming and muscle relaxation. In the intervention group mean increases were: skin temperature 3.1 degrees F (p less than .005), cardiac output .3L/min (p less than .005), oxygen consumption 19ml/min (NS); and decreases: systemic vascular resistance 162 dyne-sec-cm to the fifth power (p less than .005), respiratory rate 5/min (p less than .005) and plasma epinephrine 51 pg/ml to 37 pg/ml (NS) compared to no changes in the controls. Since physiological changes with biofeedback tend to become habitual and constant with repeated practice even outside time periods of conscious attention, biofeedback would appear to be very helpful adjunctive treatment.

4. Congestive heart failure/ exercise (83).

    21 NYHA class III patients with a mean LVEF of 22% and 9 healthy controls engaged in a supervised aerobic walking program for 52 weeks. They were tested at intervals for 6-minute walking distance, progressive bicycle ergometry to subjective exhaustion, completion of a quality of life questionnaire and standard gamble test. Controls experienced insignificant changes except for an increase in positive emotions (p=.02). 15/21 heart patients completed the year; mean increase in walking distance was 10% to 15% (p less than .001); peak power on ergometry testing increased (p less than .001); Vo 2max increased (p less than .001); quality of life scores improved significantly (p less than .001); and the gamble scores improved (p less than .001). Aerobic exercise is not only *not* contraindicated in congestive heart failure, but a supervised program improves cardiac performance.

5. Congestive heart failure/anger (84).

    In 27 subjects with established coronary artery disease, left ventricular ejection fraction decreased 5% to 7% during times when patients for 15 minutes recounted stressful incidents to which they had responded with anger. This recollection eroded left ejection fraction significantly more than physical exercise (2%), mental arithmetic testing (0%) and a speech stressor experience (0%) (p=.05). Anger, entrained by an attitude of hostility, functionally deteriorates left ventricular pump action in minutes.

Hypertension

1. Hypertension/social support (85).

    Laboratory research indicates that the presence of a supportive other can reduce physiological responses to a stressor. Male and female subjects gave an impromptu speech and received either standardized supportive or non-supportive feedback from a male or female confederate. BP and heart rate were monitored continuously during baseline and speech periods. Speakers with a supportive female audience showed a SBP increase of 25 mmHg over baseline. Those with a non-supportive female audience rose 36 mmHg. A supportive male audience led to increases of 32 mmHg, and a non-supportive male audience 28 mmHg. There was no significant effect of gender of subject. Results indicate that social support provided by women reduced cardiovascular changes for both male and female speakers compared with presence of a non-supportive female audience. Social support from men did not. These findings would be consistent with the notion that married men are healthier because they marry women. Women may not profit as much from marriage or suffer as much from separation, in terms of health outcomes, because the support they gain or lose is the less effective support of a man. These findings render more plausible the possibility that differences in social support might contribute to health differences, through the dampening of cardiovascular responses to stress.

2. Hypertension, hyper-responsive neurohypophyseal-pituitary-adrenal axis/childhood attachment (86).

    This study test the hypothesis that early loss of a parent, coupled with poor quality family relationships, would result in long-term increased cardiovascular and cortisol reactivity to stress. In 30 university students who had lost one parent before age 16, and 31 control subjects who had not, blood pressure (BP) was measured continuously during 5-minute baseline and recovery periods, and during each of 2 tasks — viewing a 7-minute video clip depicting the death of a parent, and giving a 3-minute impromptu speech (1-hour rest between tasks). Salivary cortisol samples were collected immediately before each task, and at 5 and 20 minutes post task. Quality of family relationships (FR) was measured using the Moos Family Environment Scale. Analysis revealed that higher BP was present across all experiments in those who had experienced either parental loss or poor quality FR both tasks (p less than .0S for all tasks). Increased cortisol during the movie was found in poor quality FR subjects, whereas all others showed decreases. Cortisol during the speech increased in loss subjects and decreased in non-loss subjects. These results imply that both childhood loss of a parent and poor quality of caretaking are associated with long-term increases in adult BP and distorted neurohormonal responses to stress.

3. Hypertension/anger (87).

    This study prospectively examined the relationship between anger expression style and incident hypertension in a sample of middle-aged men. 540 initially normotensive men from eastern Finland underwent a medical examination and completed a series of psychological questionnaires at baseline and at 4-year follow-up. Anger expression was assessed by Spielberger's Anger-out and Anger-in scales. At follow-up, 104 men (19.4%) were hypertensive (SBP greater than or equal to 165 mmHg and/or DBP 95 mmHg). Statistical

analyses revealed that each 1-point increase in Anger-out (anger expression) was associated with a 12% increase in risk of hypertension after 4 years of follow-up (p less than .002), which corresponded to an OR of 2.0 for hypertension among men with scores in the top tertile of the Anger-out scale v. those with scores in the bottom tertile (95% CI 1.20 to 3.38). Each 1-point increase on the Anger-in scale also was related to a 12% increased risk of hypertension (p less than .01). Adjustments for BMI, smoking, alcohol consumption, physical activity, a positive parental history of hypertension, and baseline resting DBP had little impact on the findings. These data provide strong epidemiological evidence for a positive relationship between anger expression style and subsequent hypertension, independent of known risk factors. Extreme expression of anger or failure to recognize and express anger has adverse cardiovascular consequences.

4. Blood pressure/exercise speed (88).

   In 7,000 male runners, running speed had 13-fold greater impact on SBP and a 2.8-fold greater impact on DBP than weekly mileage. In 1,800 women, speed had a 5.7-fold greater impact on SBP than weekly mileage.

5. Hypertension (89).

   In 863 Dutch men and women age 65 to 84 with established hypertension, the quartile of lowest physical activity had significantly higher blood pressures than the highest quartile after controlling for age, sex and weight. The most significant measure appeared for those who gardened (p less than .03). The lowest quartile compared to the highest also had a significantly lower HDL-C (p less than .045).

6. Hypertension (90).

   In 4,800 men and 1,200 women age 20 to 65 who were normotensive at entry, the 72% who were unfit by treadmill testing demonstrated a RR of 1.5 for hypertension after all adjustments for sex, age, follow up interval, baseline BP and baseline BMI, v. the 28% who were fit, after 1 to 12 years of follow up (median 4 years). Sedentary persons have a 20% to 50% increased risk for hypertension.

7. Hypertension (91).

   In a study of 5,463 University of Pennsylvania alumni 1962 to 1985, 739 developed hypertension. The OR for hypertension in sedentary or physically inactive persons v. the most active or fit was 1.52. The RR for hypertension in a group involved in weekly sports play was .70 to .88 (p—.OO[26]). Collegiate sports history did not affect the risk for high blood pressure. Also highly significant as risk factors were excess weight (p less than .0001), weight gain since college (p less than .0005) and parental history of hypertension (p less than .000l).

8. Hypertension (92).

In a meta-analysis of 30 BP studies, the better designed trials generally found a 6 mmHg to 7 mmHg reduction in both SBP and DBP with appropriate exercise.

9. Hypertension (93).

    46 Afro-American men age 35 to 76, whose mean pre-treatment blood pressure was greater than 180/110, were treated with medication to lower pressures close to less than 140/90. One-half were randomly assigned to ride exercise bicycles three times a week for 16 weeks, starting at 5 to 10 minutes at 600/0 of maximum heart rate and increasing to 20 to 60 minutes at nearly 800/0 of maximum heart rate plus antihypertensive medication or to antihypertensive medication alone. 18/23 men in the exercise group completed 16 weeks of exercise, and 14 completed 32 weeks. After 16 weeks, exercisers lowered their SBP only slightly, but 0BPs fell from 88 mmHg to 83 mmHg versus the sedentary hypertensives whose DBP rose from 88 mmHg to 90 mmHg (p=.002). DBP remained signficantly lower after 32 weeks of exercise, even with substantial reductions in the dose of antihypertensive medication. Interventricular septum thickness (p =.03), left ventricular mass (p=.02), and the mass index (p=.04) decreased after 16 weeks in exercisers, versus no significant change in sedentary controls. Regular exercise reduced blood pressure and left ventricular hypertrophy in African-American men with severe hypertension, even in the face of decreased medications for many.

10. Hypertension/endurance exercise (94).

    In 33 patients with mild to moderate hypertension, mean age 64, a 9-month study compared the benefits of high, moderate and low intensity exercise to sedentary controls. Moderate exercise consisted of walking, jogging, running and bicycling to 73% of VO 2max, 45 to 60 minutes 3 times per week. Low intensity exercise consisted of 1 hour of walking at 53% of VO 2max 3 times per week. SBP in the low intensity exercise group decreased significantly compared to sedentary controls (p less than .05) and mean arterial pressure also decreased significantly and equally in both low and moderate exercise groups (p less than .01 to .05). Low to moderate intensity endurance exercise at 53% of VO 2max was as effective as higher intensity exercise in reducing blood pressures in patients with mild to moderate hypertension. The moderate group achieved a significant increase in VO 2max (p less than .05).

11. Blood pressure/mood (95).

    197 healthy college students were evaluated with psychological test instruments, ascertaining levels of primary moods, including anger, sadness and happiness. Blood pressures were determined at night by automatic periodic recordings; those with high anger scores had significantly higher diastolic BP at night (p less than .0l); those with high happiness and pleasantness scores had significantly lower diastolic blood pressures (p less than .001). Heart rate was not significantly different.

12. Hypertension/biofeedback (96).

    In an open trial, mean SBP in 7 hypertensive patients fell from 165 mmHg to 148 mmHg following treatment with a mean of 22 sessions and compared to the mean of 5 control blood pressure measurements before treatment.

13. Hypertension/biofeedback (97).

    20 patients in an open trial of biofeedback relaxation exercises underwent 30-minute sessions
    of Yogic relaxation exercises reinforced by biofeedback weekly for 3 months. As a group,
    the mean BP dropped from 121 mmHg to 101 mmHg. Four patients did not finish. Drugs
    were stopped in 5 patients and reduced 33% to 60% in an additional 7 patients.

14. Hypertension/biofeedback (98).

    20 hypertensive patients were enrolled in regular relaxation and biofeedback sessions; results
    were compared to 20 controls matched for age and sex. Most patients were on drug
    treatment. Initial mean blood pressures of 159/100 in the biofeedback group were reduced to
    139/86 mmHg at the end of treatment (p less than .001), compared to a reduction in controls
    from 163/99 mmHg to 163/97 mmHg (p greater than .1). At 9 to 12 months of follow up, the
    mean BP in the treatment group was 144/87 (p less than .01) v. 164/98 in controls (p greater
    than .1).

15. Hypertension/biofeedback (99).

    A group of *5* patients with established hypertension is monitored for a 7-week run-in period
    during which patients took their blood pressures and mailed in the results daily. Then over a
    period of three weeks they were taught with biofeedback to voluntarily raise and lower their
    systolic blood pressure. The mean rise of the subjects in their SBP-raising efforts was 15%
    and the mean fall in their SBP-decreasing efforts was 11%. Heart rate, respiratory rate,
    muscle tension and EEG did not change. They then monitored their pressures at home for 3
    months during which patients mailed in the results daily. The mean SBP fell from 153 mmHg
    in the run-in period to 135 mmHg and mean DBP decreased 7.5 mmHg in rechecks at 3
    months' follow up. The SBP fall in each patient was significant (p less than .01) and DBP
    fall was significant in two patients (p less than .01). At home the patients were able to reduce
    mean SBP from 141 mmHg to 125 mmHg.

16. Hypertension/biofeedback (100).

    Review. Several well-controlled studies demonstrate significant and lasting reduction in
    blood pressures. A number also demonstrate, after biofeedback training, much quicker return
    to baseline after exposure to a variety of stresses in the laboratory. Benefits require long-term
    practice, and raise issues of motivation.

17. Hypertension/biofeedback (101).

    8 male hypertension patients were seen for 9 weekly 2-hour sessions of biofeedback training
    after 3 weekly sessions which served as a BP baseline. Home readings were obtained 5 times
    daily and recorded. Mean pressures after treatment were 143/85 mmHg, which compared to
    149/93 mmHg at entry.

18. Hypertension/biofeedback (102).

This is a summary of Elmer Green's early experience, methods and success in treating hypertension in 12 subjects. 11/12 were able to discontinue their use of antihypertensive medications. At follow up, one-half still had blood pressures at or below those recorded at the close of biofeedback training. He quotes the advice to Olympic athletes to "learn to relax at every stroke."

19. Hypertension/biofeedback (103).

8 normotensive adults and 8 hypertensive adults underwent EMG biofeedback and autogenic-type training for 12 to 20 one-hour sessions. Both normotensive and hypertensive groups significantly decreased their muscle tension levels from baseline (p less than .05). Only the hypertensive group decreased the mean SBP, from 145 mmHg at baseline to 131 mmHg (p less than .05), DBP from 90 mmHg to 81 mmHg (p less than .005) and MAP (mean arterial pressure) from 106 to 93 mmHg (p less than .05). Mean urinary cortisol in the hypertensive group fell 20% from 69 to 56 ug/gm of creatinine (p less than .001) and plasma cortisol fell 23% from 15 pg/dl to 12 pg/dl (p less than .005).

20. Hypertension/biofeedback (104).

Blood pressure, heart rate, stroke volume, cardiac output and total peripheral resistance were measured in 10 hypertensive and 6 normotensive subjects before and after a comprehensive stress management program including 9 weekly thermal biofeedback sessions and home BP monitoring. Baseline SBP (p less than .01), DBP (p less than .001) and pulse (p less than .05) decreased significantly after participation in the program. Reactivity to a psychological stressor (oral quiz) was also significantly lower as shown in lower SBP, DBP, heart rate and cardiac output (all p less than .05).

21. Hypertension/biofeedback (105).

26 of 40 subjects with hypertension (65%) met the criteria for success after biofeedback treatment. Mean arterial pressure decreased from 107 to 96 mmHg with the initial 6 weeks of biofeedback treatment. At 1, 2, and 3 years of follow up, 50%, 60%, and 50%, respectively, of those following up retained their criteria for successful treatment (p=.004, .003 and NS, respectively). Collectively, significant success was achieved in those following up (p less than .001). Forehead EMG readings were significantly reduced after treatment and at 1 year (p=.001 and p less than .015, respectively). At one year of follow up, anxiety was significantly less (p=.03) and urinary cortisol and aldosterone were significantly less (p=.008 and p=.05 respectively).

22. Hypertensioni/biofeedback (106).

21 unmedicated hypertensives were randomly allocated to 1) a behavioral treatment group utilizing thermal biofeedback, deep muscle relaxation and anxiety management training; 2) a placebo attention group; or 3) a control group of untreated patients. Effects on 7 normotensives were also monitored. Immediate results after treatment revealed significant

reduction in SBP and DBP only in the behavioral group (p less than .001). At 6 months, SBP and DBP were still significantly lower (p less than .02 and p less than .01)

23. Hypertension/biofeedback assisted relaxation, diuretics (107).

30 hypertensive patients were relegated to either treatment with a diuretic (Maxide, n=10), or to biofeedback combined with diuretic treatment (n=20). The Maxide group at 4 and 8 weeks did not lower mean arterial pressure significantly; the combined treatment group showed a decline in mean arterial pressure (p=.01). One of the Maxide group and 11 in the combined group met the criteria for success (p for difference = .02).

24. Hypertension, stroke/Qigong (108).

244 hypertensive patients, whose mean BP prior to treatment was 175/108 mmHg, were taught Qigong to be practiced regularly. Mean duration of hypertension had been 5.8 years. Results were compared to those of a control group not treated with Qigong. Elements emphasized in the Qigong were tranquil mind, relaxed body and smooth breathing. In follow up, total stroke mortality on the Qigong was 19% compared to 42% in controls (p less than .0 I). In the consistently-practicing Qigong subgroup (practicing more than 75% of the time) mortality was 11% vs.29% in the inconsistent group (p less than .001). Differences between the inconsistent and control groups was (NS). Consistent Qigong and drug therapy significantly prevented stroke (p less than .01 and less than .05) respectively.

25. Hypertension/progressive relaxation, meditation (109).

127 hypertensive African-American subjects, age 55 to 85, were randomly assigned to 3 months of: 1) Transcendental Meditation; 2) progressive muscle relaxation; or 3); a lifestyle modification education control group. Baseline mean blood pressure was 179/104. Significant reduction in SBP (11 mmHg) and DBP (6.4 mmHg) occurred at the end of the study in the TM group compared to education controls (p less than .0003 and less than .00005 respectively). The progressive relaxation group compared to the education group lowered SBP 5 mmHg and DBP 3.3 mmHg (p less than .054 and less than .025 respectively). The TM subjects experienced twice the SBP reductions (p=.02) and DBP reductions (p=.03) of the progressive muscle relaxation subjects. All these results were equivalent to reductions commonly obtained with medication.

26. Hypertension/stress/relaxation (110).

192 men and women aged 35 to 64 had 2 or more of these risk factors for CAD: smoking greater than .5 packs of cigarettes/day; BP greater than 140/90; total serum cholesterol greater than 6.3mmol/L. They were randomly assigned to either a control group (health education advice) or behavior modification (health education advice plus group sessions one hour/week for 8 weeks including breathing exercises, meditation training, relaxation education and stress management technique.

27. Hypotension/biofeedback (111).

Two patients with cervical spinal cord lesions with debilitating postural hypotension which had confined them to bed rest, because all procedures to prevent fainting on sitting had failed, were treated with auditory and visual biofeedback for voluntary increases in blood pressure. Within several weeks, both learned to increase their SBP markedly from baseline, and achieved and maintained the ability to maintain acceptable blood pressures when erect. After biofeedback training they learned to increase their sitting SBP 20 mmHg to 70 mmHg. At first both pulse and SBP increased, but with continued practice their responses gradually elicited SBP rise without pulse increase. Hyperpnea or performing the Valsalva maneuver alone did not effect blood pressure, but when these accompanied the application of the biofeedback learning, even larger SBP increases occurred. Their initial mental images which enabled them to increase SBP included becoming angry about their condition (paraplegia), getting excited about sexual intercourse, or imagining their BP being a horse in an exciting horse race. After considerable practice, they no longer used these images to arouse their sympathetic nervous system and emotions, but successfully raised their SBP at will whenever they wanted to.

28. Hypertension/hypnosis (112).

The effect of 9 hypnosis sessions at 1/2-day intervals on 6 non-medicated hypertensive patients and 9 on medications was compared to 6 controls. Basal mean pressures were established in a series of five separated readings before treatment. Jacobsen's Progressive Relaxation was used, followed by a hypnotic exercise in which the subjects were asked to close their eyes, imagine being in their own bed in their own home at night, relaxing their mind and about to drop off to sleep in a deep inner relaxation. They were then presented a picture of breathing slowly and deeply, and slowly walking down a long stairway. "You are learning how muscle and inner relaxation are achieved. You will be able from now on to bring about the relaxation yourself." BP was recorded post-session. Controls reported at the same intervals to sit quietly for comparable lengths of time. In the no-drug group, post-session mean SBP fell 17% versus baseline by the eighth session (p less than .01); post-session mean DBP fell 20% versus baseline by session 9 (p less than .01). In the drug-treated group, SBP fell a mean of 16% by session 3 (p less than .01) and DBP by 14% by sessions 6 to 9 (p less than .01). Controls showed no change.

29. Hypertension/stress (113).

In 40 men with mild to moderate hypertension, the rises in SBP and DBP when faced with a problem-solving task were significantly greater when their work was externally paced v. self-pacing: rises of 38 mmHg vs. 20 mmHg in SBP (p less than .005); and 16 vs. 10 mmHg in DBP, (p less than .005) were seen, respectively. Implications in better management styles seem clear here.

30. Hypertension/stress (114).

Blood pressure surges are known to be corre1ated~with sudden death, myocardial infarction and other cardiovascular complications. In 48 coronary artery disease patients, a standard true/false personality test was used to separate subjects into high and low defensiveness groups. Their blood pressures were monitored in two stress situations: mental mathematical calculations, and public speaking. At baseline and at the conclusion of each period of

exposure to stress, seven measures of cardiac function were checked, including systolic and diastolic blood pressure, pulse rate, cardiac output, and peripheral resistance. With the two stress experiences, systolic blood pressure rose a mean of 33 mmHg and 44 mmHg, and DBP 125 mmHg and 21 mmHg, respectively. All outcome measures rose significantly with both experiences (p less than .00l to pc00001). The cardiac function measures in the group with a high measure of emotional defensiveness were significantly more distorted compared to the low defensiveness group (p~=.06 to ~.0006) during mathematical calculations and p=.04 to p=.001 with public speaking. Analysis of BP changes only were highly significant in the highly defensive v. the less defensive (p less than .00008).

31. Hypertension/Stress (115).

    This cross-sectional study of 200 white-collar women with full time jobs involving high or low strain, and with or without children, was conducted to determine whether large family responsibilities and their combination with high job strain were associated with an increase in ambulatory blood pressure (BP). Job strain was measured using the Karasek Job Content Questionnaire. Subjects were selected from a population of 3,200 women of all ages. Mean BPs were calculated from records of ambulatory BP monitors worn for 24 hours including a full a working day. Different measures of family responsibilities were used, based on the number of children and their ages, and domestic work. Among women holding a university degree (n=69), those with large family responsibilities bad increases in SBP and DBP of 2.7-5.7/1.8 mmHg to 4.0 mmHg, respectively (p is less than or equal to .05). Increases in diurnal SBP and DBP reached 8. 1 to 10.9/5.5 to 7.1 mmHg (p is less than or equal to .0l) among women having both large family responsibilities and high job strain. These results were independent of confounders. There was no significant association among women without a university degree (n= 130). Large family responsibilities were associated with significant increases in diurnal SBP and DBP in white-collar women holding university degrees. In these women, the combined exposure of large family responsibilities and high job strain tended to have a greater effect on BP than the exposure to only one of these factors.

32. Hypertension/white coat (116).

    419 hypertensives stopped all antihypertensive medications and conventional blood pressures were recorded for 4 to 8 weeks in this European study. Enrollment in the study required diastolic levels between 95 mmHg and 114 mmHg at the last of these baseline readings. All then began lisinopril 10mg daily and were randomized to a conventional BP reading group or a daytime ambulatory BP reading group. Pressures were recorded over a 182-day time period. If warranted, lisinopril was increased, hydrochlorothiazide added and ultimately amlopidine added to target control at diastolic BP 80 mmHg to 89 mmHg. 26% of the ambulatory patients stopped medications compared to 7% of the conventional group (p less than .001). 27% of ambulatory patients required multiple drugs versus 43% of the conventional reading group (p less than .001). The differences can be attributed to "white coat" hypertension. Ambulatory monitoring could save 20% of the long-term health-care hypertension costs.

33. Hypertension/stress-work (117).

In a study of 288 hourly blue collar workers employed for a minimum of 10 years, worker ratings of 6 of 15 stressful work conditions were significant predictors of DBP. Those with elevated pressures were significantly related to reporting: little opportunity for promotion (p=.02); little opportunity for participating in work decisions (p=.03); uncertain job future (w.[02]); unsupportive coworkers (p=.02); unsupportive foreman (p=.03); difficulty communicating with others (p.03); and overall dissatisfaction on the job (p=.01). The cohort reporting high job satisfaction was significantly related to low diastolic pressures (p less than .01).

34. Hypertension/stress-socioecological factors (118).

1,000 Detroit white and black men and women were recruited for this study. 246 blacks were from a high stress neighborhood (many separated families, high crime, unstable housing, low income) and 262 from a low stress neighborhood; 250 whites from a high stress neighborhood and 242 from a low stress neighborhood. Significantly higher SBP and DBP were found in black men under high stress (p less than .02); significantly higher DBP in black women under high stress (p less than .05); and significantly higher SBP in white women with high stress.

35. Hypertension/stress (92).

In a meta-analysis of numerous case-control, cross-sectional and prospective studies, the relationship between stress and hypertension is persistent after controlling for age, race, body mass index, type A behavior, family history of hypertension, physical activity, urinary sodium excretion and alcohol consumption.

36. Hypertension/white coat effect (119).

Mean SBP and DBP readings of 1,710 hypertensive patients who took or had taken their blood pressures at home were 13 mmHg and 8 mmHg lower than readings in the physician's office. Differences were most marked in women, SBP (p less than .00l) and DBP (p less than .05). Office BP in patients under pharmacological treatment decreased from 166/101 to 145/86 mmHg and home BP decreased from 153/94 to 139/85 mmHg (both p less than .000 I). Some patients with mild to moderate blood pressure may be unnecessarily under drug treatment on the basis of office readings only.

37. Hypertension, emotional state/music (120).

10 subjects chose 1/5 taped music programs to which they listened with earphones for 30 minutes. They completed the Emotion Condition Rating assessing depression, sadness, despair, psychological isolation/defensiveness, anxiety, apprehension and tension, difficulty in medical management and pre-occupation with pain and physical suffering. Acting as their own controls before and after, DBP decreased from 80mmHg to 75 mmHg, SBP from 11 mmHg to 109 mmHg and heart rate from 74/mm to 67/mm (all p less than .001).

38. Hypertension (121).

   43 office psychotherapy patients demonstrating acute anxiety, depressions and anger were studied for the association of these emotions with blood pressure. Significant rise in SBP and DBP (p less than .01 – p less than .05) occurred in all 3 emotional states.

39. Hypertension/anxiety (122).

   A total of 1,125 subjects (500 men, 625 women) with normal blood pressures were followed for 20 years as part of the Framingham study. Initial parameters measured included indicators of anxiety, anger, expression of anger, blood pressure, heart rate, relative weight, age, hematocrit, alcohol intake, smoking history, education and glucose tolerance. Subsequent hypertension was defined as blood pressure greater than 160/95 mmHg, or being placed on antihypertensives. Middle-aged men who went on to develop hypertension had significantly greater anxiety levels (p=.02) compared to men who remained normotensive. In older men and in women, anxiety, anger and expression of anger were not found to be independent predictors of hypertension.

40. Cardiovascular response/mood (123).

   32 subjects studied while seated and during physical standing exercise for the cardiovascular effects of imagery. Imagery clearly affected cardiovascular patterns (p less than .001). DBP increased significantly with anger (p=.005). Exceeding changes with happiness, sadness and fear. Anger was distinctly the opposite of relaxation. Sadness, happiness and fear responses were similar to those in seated control circumstances. All four emotions raised SBP above the two control readings (p less than .001) but the results could not differentiate them. Increases in heart rate were greater than in both the control state and relaxation circumstance (p less than .001). Fear and anger had significantly greater increases than sadness and especially happiness. Emotional levels were self-rated chosen on an analogue scale. Subjects engaged in one trial each using imagery from the past to induce the desired emotional state and reproduce it in imagery for 2 minutes. Sadness interfered with normal cardiovascular adjustments during exercise; other emotional states did not. SBP was significantly higher in anger during exercise than the other 3 emotional states (p less than .001). SBP recovered faster during fear than during anger during exercise. Anger and fear increased SBP and heart rate significantly during exercise (p less than .001), anger exceeding fear.

41. Hypertension/racial discrimination (124).

   4,076 patients with hypertension (821 black men, 1,143 black women, 1,006 white men and 1,106 white women), age 25 to 37 were assessed for a number of determinant factors. In black men, a significant correlation existed for those reporting themselves to have been the victims of racial discrimination; their mean BPs were 7 mmHg higher (95% CI 4.5 to 8.8). In blacks not reporting discrimination, mean BP was .5 mmHg lower (95% CI -4.3 to 3.3). Discrimination appears to be a significant factor in the well-known hypertensive proclivity in blacks.

42. Blood pressure/pets (125).

    784 pet owners had lower SBP (p less than .21) and DBP (p less than .37) and triglycerides
    (p less than .48) than 4,957 non pet-owners. The former get more exercise.

43. Hypertension/stress (126).

    Only one patient in 7 whose blood pressure is medication-controlled as measured in the
    physician's office is controlled when monitored under work stress.
    Mean Blood Pressure= <u>Systolic BP - Diastolic BP</u> + Diastolic BP

    Hyperventilation for 30 seconds eliminates central control mechanisms and is a major
    method for assessing response to stress reduction. There is no reduction in sudden death or
    heart attack incidence with drug management of blood pressure. There is a decrease in the
    incidence of strokes.

44. Hypertension/"white coat" monitoring (127).

    171 patients identified as having hypertension by three outpatient DBP readings greater than
    90 mmHg underwent 24-hour ambulatory BP monitoring. 58 were identified as having
    "white coat" hypertension because their average 24-hour DBP was less than 85 mmHg and
    greater than 15 mmHg less than the average of their three hypertensive office readings. 40
    white coat patients were paired against 40 normotensive controls. The comparable 24-hour
    DBP readings were equivalent to within 2 mmHg. 51 of the "white coat" patients were
    matched to 51 confirmed hypertensive patients {within a variance of 3 mmHg). White coat
    subjects had more BP variability throughout the day than the normotensives (p less than .05),
    greater left ventricular septal thickness (p less than .05) and higher levels of renin,
    aldosterone and insulin (p less than .01) and norepinephrine (p less than .05). Compared to
    confirmed hypertensive patients, white coat subjects had significantly higher renin levels (p
    less than .01). Other comparisons were not significantly different. The authors postulate that
    lifestyle issues may be more important in white coat patients.

45. Blood pressure/speech (128).

    111 cardiovascular disease patients (33 had hypertension, 78 coronary artery disease)
    underwent trials of automatically triggered BP and pulse measurements at frequent intervals
    before and during a six-minute period of reading out loud. Subjects read slowly and rapidly
    in randomly selected order. Coronary prone behavior was assessed using a validated
    Structured Interview. Heart rate, mean arterial pressure and BPs were significantly lower in
    periods of slow speech compared to periods of rapid speech (p less than .0001). Coronary-
    prone behavior had no effect on the rate of speech. Baseline measures and post-verbalization
    measures showed no differences, and all subjects spoke significantly faster during rapid
    compared to slow speech (p less than 000l).

46. Hypertension (129).

    Ninety-six hypertensive patients age 16 to 60 who were otherwise healthy were exposed to a
    series of treatments by one healer from a panel of eight in double-blind fashion. End points

were SBP, DBP, pulse rate and weight. Each healer treated 6 patients over one week's time. One half (n=48) were randomly selected to receive the treatments and the remainder acted as an untreated control group. All patients continued their usual medical treatment. Neither patients nor attending physicians knew who received the treatment and who did not. Each healer engaged in relaxation; followed by attunement with the higher power or infinite being; followed by visualization or affirmation of the patient being in a perfect state of health; followed by an expression of thanks to God or the Source of all power and energy. Significant improvement in SBP was observed in the healer treated group whose pressures improved in 92.3% vs. 73.7% of the control group (p=.0144). DBP, pulse rates and weights remained unchanged.

47. Hypertension/healing (130).

120 hypertensive patients were divided into 3 subgroups containing equal numbers of persons on antihypertensive medications. Group I) received treatment by laying-on-of-hands; 2) received distant healing; 3) received no healing efforts (controls). Groups 2) and, 3) were treated behind one-way mirrors so that patients and experimenters were unaware whether a healer was present. Treatments lasted 20 minutes and were given once weekly times 15 weeks. 12 healers provided the treatments. In the 3 weeks between screening and the first session, mean fall in SBP and DBP were 13 mmHg and 5mmHg, respectively (p less than .05). After 15 weeks the mean drop in SBP and DBP in all 3 groups was significant (p less than .001). There was no difference in groups 2) and 3), suggesting that the changes may have been explained by a placebo effect.

Miscellaneous

1. Coronary heart disease/placebo (131;132).

The Coronary Drug Project was carried out to evaluate the efficacy and safety of several lipid-influencing drugs in the long-term treatment of coronary heart disease. The five-year mortality in 1103 men treated with clofibrate was 20.0 per cent, as compared with 20.9 per cent in 2789 men given placebo (P = 0.55). Good adherers to clofibrate, i.e., patients who took 80 per cent of more of the protocol prescription during the five-year follow-up period, had a substantially lower five-year mortality than did poor adherers to clofibrate (15.0 vs. 24.6 per cent; P = 0.00011). However, similar findings were noted in the placebo group, i.e., 15.1 per cent mortality for good adherers and 28.3 per cent for poor adherers (P = 4.7x10-16). These findings and various other analyses of mortality in the clofibrate and placebo groups of the project show the serious difficulty, if not impossibility, of evaluating treatment efficacy in subgroups determined by patient responses (e.g., adherence or cholesterol change) to the treatment protocol after randomization. Similar results were also shown in BHAT and CHF STAT.

2. Survival of patients improvement/optimism (133).

Objective: To study the association between explanatory style, using scores from the Optimism-Pessimism (PSM) scale of the Minnesota Multiphasic Personality Inventory (MMPI), and self-reported health status, using scores from the 36-Item Short-Form Health Survey (SF-36). PATIENTS AND METHODS: A total of 447 patients who completed the

MMPI between 1962 and 1965 as self-referred general medical outpatients and also completed the SF-36 thirty years later compose the current study sample. The associations between the scores on the SF-36 and the MMPI PSM scale were evaluated by analysis of variance and linear regression analysis. RESULTS: Of 447 patients, 101 were classified as optimistic, 272 as mixed, and 74 as pessimistic. Scores on all 8 health concept domains from the SF-36 were significantly poorer in the pessimistic group than in both the optimistic and the mixed group. CONCLUSION: A pessimistic explanatory style, reflected by higher PSM scale scores, was significantly associated with a self-report of poorer physical and mental functioning on the SF-36 30 years later.

3. Diagnostic tests/disability (134).

Laboratory tests are purported to affect patients even if they have no diagnostic values. We tested this hypothesis by measuring clinical outcomes of 176 patients thought clinically to have nonspecific chest pain. They were randomly allocated either to have a routine electrocardiogram and serum creatine phosphokinase tests (test group) or to have all diagnostic tests withheld (no-test group). Fewer patients in the tests group (20%) reported short-term disability after the index visit than patients in the no-test group (46%) (p = 0.001). Logistic discriminant analysis confirmed that the use of diagnostic tests was an independent predictor of recovery. Patients in the test group felt that care was "better than usual" more often (57%) than patients in the no-test group (31%) (p = 0.001). After the index visit, the two groups were equally worried about serious disease and equally sparing in their use of other medial care for chest pain.

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Appendix V: Dietary Supplement Intake Form

Your healthcare professional needs the following information about your usual supplement and dietary habits to develop a personal plan for you. Please complete all sections completely and accurately.

NAME: _____

AGE: _____   DATE: _____

1) **What kind of supplements do you use? (Check al that apply)**
   ❑ none
   ❑ multivitamin/mineral supplement
   ❑ herbal or botanical supplement
   ❑ amino acid or protein supplement
   ❑ fiber supplement
   ❑ other (see question 14 checklist at end of this form)

2) **How long have you used this (these) supplement(s)?**
   ❑ 1 month or less
   ❑ 3 months
   ❑ 6 months
   ❑ 1 year
   ❑ more than 1 year (specify) _____

3) **How long do you plan to use this (these) supplement(s)?**
   ❑ Indefinitely
   ❑ 1 year
   ❑ 6 months
   ❑ 3 months
   ❑ 1 month or less

4) **What are your primary reason(s) for taking this (these) supplement(s)?**
   ❑ for its preventive effect against disease/medical condition
   ❑ to help treat a disease/medical condition
   ❑ general wellness
   ❑ energy
   ❑ weight loss
   ❑ pregnancy/lactation
   ❑ other (specify) _____

   If used to treat specific medical condition: What are your symptoms?
   _____
   _____
   _____
   _____

5) **How long have you had the symptoms/medical condition?**
   ❑ 1 week or less
   ❑ 1 month
   ❑ 3 months
   ❑ 6 months
   ❑ 1 year
   ❑ more than 1 year (specify): _____
   _____
   _____

6) **Have symptoms improved since you started taking this (these) supplement(s)?**
   ❑ Yes (explain how) _____
   _____
   _____
   ❑ No

7) **Are you currently taking or have you recently taken any over-the-counter or prescription medications, including oral contraceptives?**
   ❑ Yes
   (specify)_____
   _____
   _____
   ❑ No

8) **Do you have any additional illnesses or medical conditions?**
   ❑ Yes
   (specify)_____
   _____
   _____
   ❑ No

9) **Are you pregnant or breast feeding?**
   ❑ Yes
   ❑ No

10) **Do you drink alcohol?**
   ❑ Yes
   ❑ No
   If yes, how often?
   ❑ rarely
   ❑ occasionally
   ❑ often
   ❑ never
   If yes, how much at one sitting?
   ❑ 1 glass
   ❑ 2 glasses
   ❑ 3 glasses or more

11) Do you smoke?
❑ Yes
❑ No

If yes, how often and how much?
❑ 1-5 cigarettes, cigars, pipes per day
❑ 1 pack per day
❑ 2 packs per day
❑ more than 2 packs per day

12) Are you allergic to any medications, foods, plants, or flowers?
❑ Yes (specify)

_____
❑ No

13) Are you on a self- or medically-prescribed eating plan/diet?
❑ Yes (specify)

_____
❑ No

14) What specific supplement(s) do you take, amount/dose you take, and how often do you take it?

Supplement	Amount/Dose	Number of Doses (per day or week)
Aloe	_____	_____
Amino Acid(s)	_____	_____
Black cohosh	_____	_____
Bee pollen	_____	_____
Calcium	_____	_____
Cat's claw	_____	_____
Chondroitin	_____	_____
Chromium	_____	_____
Coenzyme Q10	_____	_____
Creatine	_____	_____
"Andro"/DHEA	_____	_____
Dong quai	_____	_____
Echinacea	_____	_____
Evening primrose oil	_____	_____
Feverfew	_____	_____
Fiber	_____	_____
Fish oil/DHA	_____	_____
Folic acid	_____	_____
Garlic	_____	_____
Ginger	_____	_____
Ginkgo biloba	_____	_____
Ginseng	_____	_____
Goldenseal	_____	_____
Grape seed extract	_____	_____
Iron	_____	_____
Kava kava	_____	_____
Ma huang/Ephedra	_____	_____
Milk thistle	_____	_____
Multiple vitamin/mineral	_____	_____
Peppermint	_____	_____
Pyruvate	_____	_____
St. John's wort	_____	_____
Saw palmetto	_____	_____
SAM-e	_____	_____
Valerian	_____	_____
Vitamin B complex	_____	_____
Vitamin C	_____	_____
Vitamin D	_____	_____
Vitamin E	_____	_____
Other	_____	_____

Appendix VI: Compendia

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Appendix VII: Review Articles

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