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INSIDE

Financial Disclosure: *Internal Medicine Alert's* editor, Stephen Brunton, MD, is a consultant for Abbott, Amylin, Boehringer Ingelheim, Eli Lilly, Endo, Novartis, and Novo Nordisk. Peer reviewer Gerald Roberts, MD, reports no financial relationship to this field of study.

The Mystery of Warts: Duct Tape, Moleskin or What?

ABSTRACT & COMMENTARY

By Joseph E. Scherger, MD, MPH

Professor, University of California, San Diego

Dr. Scherger reports no financial relationship to this field of study.

Synopsis: *Duct tape is no more effective than moleskin for the treatment of common warts. Occlusion therapy with both for 7 days will give resolution in just over 20% of patients.*

Source: Wenner R, et al. Duct tape for the treatment of common warts in adults: A double-blind randomized controlled trial. *Arch Dermatol.* 2007;143:309-313.

THE HISTORY OF THE TREATMENT OF COMMON WARTS IS A CURIous blend of folklore and science. The mysterious thing about warts is that they spontaneously go away in most patients. When they spontaneously resolve is highly variable, from a few months to years. People, including clinicians, have tried lots of remedies, and when they seem to work, new folklore is created.

In 2002 and 2003, the use of duct tape for common warts became popular after a clinical trial comparing it favorably to cryotherapy.[1,2] Duct tape became part of the medical tool kit of physicians and patients wishing to avoid the traditional use of salicylic acid or liquid nitrogen. Seven days of duct tape occlusion sure was easier than weeks of messy acid treatment or liquid nitrogen which is not available in many primary care offices.

Wenner and his colleagues at the University of Minnesota performed a double-blind randomized controlled trial of duct tape and moleskin on 90 immunocompetent volunteers at the VA hospital in Minneapolis. Both groups wore pads for 7 days, either duct tape or moleskin. The 7-day process was repeated for 2 months or until the wart resolved. Patients were seen at 1 month and 2 months, with a follow-up visit at 6 months.

VOLUME 30 • NUMBER 5 • MARCH 2008 • PAGES 33-40

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Eight of 39 patients in the duct tape group (21%) and 9 of 41 patients in the moleskin group (22%) had complete resolution of the wart by two months. The authors concluded that there was no difference between occlusion therapy with duct tape and moleskin for the treatment of common warts.

COMMENTARY

Controlled clinical trials have a nice way of bringing truth to folklore in medicine. Duct tape received such praise for wart treatment that I suspected we would have medical suppliers carrying it. Now we know it helps in the resolution of common warts, but no more than moleskin, which is designed to be on the skin for extended periods.

So what should we do with warts? I still personally favor liquid nitrogen. Good deep freezing gives rapid results. After 30 years, I have never met a wart I couldn't kill, but sometimes 3-5 applications 2-3 weeks apart are necessary. Salicylic acid remains an option, but I find it messy and uncomfortable over many weeks. Occlusion therapy is simple and sometimes effective, whether with duct tape or moleskin. Just clean the skin and apply it for a week. Repeat as necessary for two months.

Reassure all patients that common warts resolve spontaneously. Our immune systems ultimately take care of the problem. ■

Internal Medicine Alert, ISSN 0195-315X, is published twice monthly by AHC Media LLC, 3525 Piedmont Road., NE, Building. 6, Suite 400, Atlanta, GA 30305.

SENIOR VICE PRESIDENT/GROUP PUBLISHER: Brenda Mooney.

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GST Registration Number: R128870672.

Periodicals postage paid at Atlanta, GA.
POSTMASTER: Send address changes to ***Internal Medicine Alert***, P.O. Box 740059, Atlanta, GA 30374.

Back issues: $21. Missing issues will be fulfilled by Customer Service free of charge when contacted within one month of the missing issue's date.

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United States
1 year *with* free AMA Category 1 credits: $289
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This CME activity is intended for the internist/family physician. It is in effect for 36 months from the date of the publication.

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Dementia Is a Death Sentence

ABSTRACT & COMMENTARY

By Allan J. Wilke, MD

Residency Program Director, Associate Professor of Family Medicine, University of Alabama at Birmingham School of Medicine—Huntsville Regional Medical Campus, Huntsville

Dr. Wilke reports no financial relationship to this field of study.

Synopsis: *The onset of dementia heralds death in about 4½ years.*

Source: Xie J, et al. Survival times in people with dementia: analysis from population based cohort study with 14 year follow-up. *BMJ.* 2008;336:258-262. Jan 10 [Epub ahead of print]

While it is accepted that people with dementia have truncated life spans, reported survival times vary from 3 to 9 years. These researchers, using Great Britain's Medical Research Council's Cognitive Function and Ageing Study (MRC CFAS), a multicenter, longitudinal, prospective, population-based, epidemiological study, sought to clarify the issue. The strengths of this database are its size (13,004 participants), its representation (community-dwelling and institutionalized), its prospective design, and its long follow-up (14 years). The participants, who were free of dementia at the time of enrollment, were interviewed and examined. They were re-examined at two-year intervals. Factors associated with mortality present in earlier studies (age, sex, marital status, place of habitation, education level, social class, functional status, self assessment of health, and living in a deprived neighborhood) were recorded. The researchers did not distinguish between types of dementia.

During the study, there were 438 incident cases of dementia (71% female), and 356 of these 438 (81%) died. Dementia was diagnosed at median age 84 years for women and 83 for men. Death occurred at a median age of 90 for women and 87 for men. Both of these were statistically significant. The median survival time for all was 4.5 years (4.6 years for women, 4.1 for men). In multivariate analysis, male gender (Hazard Ratio [HR] 1.4), age at onset, and degree of

dementia predicted shorter survival. Place of habitation, marital status, and mini-mental state examination (MMSE) score did not.

COMMENTARY

As a medical director of a nursing home, I complete death certificates weekly. Although patients with dementia sometimes die of other diseases, such as pneumonia, frequently they just "dwindle" away. When this happens, I list "dementia" as the proximal cause of death. If you are willing to accept that the results of this study, performed in Great Britain, are applicable in your practice, you have been a given a valuable tool to use in your practice with patients and their families. A study performed at Group Health Cooperative, Seattle, WA came to similar conclusions. As devastating as a diagnosis of dementia can be, the uncertainty of how long the patient will be afflicted is also important. Health planners will find this information useful, too.

Curiously, this article was not explicit in the gender breakdown of the cohort. This makes it difficult to say precisely how gender affects the outcome. Using data from an earlier report from this group, we can estimate that about 60% of the cohort was female.

You may be confused why degree of dementia was significant, but MMSE wasn't. Some of this relates to how dementia was measured and what MMSE measures. The researchers used the Blessing Dementia Scale to measure functional performance, including some Activities of Daily Living and changes in personality. MMSE measures cognitive function. As functional capacity declines, demented patients are more likely to become bedbound and less likely to maintain adequate nutrition. Death is surely close behind. ■

CT Scans and Radiation Exposure

ABSTRACT & COMMENTARY

By Mary Elina Ferris, MD

Synopsis: *Increasing use of CT scans has led to an increase of radiation exposure to its recipients, potentially causing up to 2% of new cancers, especially in children.*

Source: Brenner DJ, Hall EJ. *N Engl J Med.* 2007;357:2277-2284.

CT SCANS DELIVER A LARGER RADIATION DOSE THAN conventional X-Rays, for example 50 times more from an abdominal CT scan compared to a single anterior-posterior flat abdominal X-Ray (KUB). For neonates this dose may be even doubled. Radiation doses to a particular organ are mathematically calculated in theory and depend on a number of factors, including size of the patient and number of scans. Radiation-induced damage to DNA or other molecules is usually repaired rapidly by the body's cells, but chromosomal mutations can occur which can potentially induce cancers.

Most scientific information about radiation-induced cancers comes from studies of 25,000 survivors of the atomic bombs dropped on Japan in 1945, who have now been followed more than 50 years. Although their exposure was in a single dose, rather than cumulative, and involved total body radiation rather than specific organs, their outcomes have been used to determine safety levels for exposure. Their average radiation exposure was equivalent to 2-3 CT scans, and significant increases in subsequent cancer risk have been found. Studies of workers in the nuclear power industry who have been exposed to the equivalent of one CT scan and above also show a gradually increasing cancer risk, similar to the atomic bomb survivors. Growing children are thought to be more radiosensitive since they have a larger number of dividing cells. Data from pediatric atomic bomb survivors show more cancer risk also because they have more years of life to express potential cancers.

Lifetime cancer risk from estimated organ radiation doses have been calculated for a single typical CT scan of the head or abdomen, ranging from 0.08% for a neonate to zero for a 70-year-old. Although individual risk is small, with the widespread use of CT scans in the population it may account for 1.5 to 2% of new cancer diagnoses. Increasing use of multiple CT scans would thus theoretically lead to even more cancers attributable to this exposure.

COMMENTARY

The potential hazards of radiation exposure from CT scans is an increasing concern as the utilization of these scans rises exponentially, from 3 million in 1980 to over 2 million in the U.S. today. In Japan they are utilized even more frequently, where there are 3 times more CT scanners per population than in the U.S. For children, CT scans provide the advantage of the brief time of the procedure (often less than 1 second), which can avoid the need for anesthesia to keep the child from moving during the study. CT scans are also being increasingly used in asymptomatic adults for screening purposes.

As alarming as this radiation exposure may appear, it's also important to note that no large epidemiologic studies linking actual CT exposure to subsequent cancers have yet been done, although some are underway.

CT scans can provide crucial diagnostic information and have saved many lives; the authors of this study note that the "use of CT represents probably the single most important advance in diagnostic radiology." Nonetheless, many CT scans may be ordered without clear scientific evidence and as part of defensive medicine. Clinicians need to be aware of the potential carcinogenic exposure from multiple CT scans, and should carefully consider the risk-benefit ratio when choosing CT scans for diagnostic assistance. ■

Warfarin vs Clopidogrel Plus Aspirin for Atrial Fibrillation

ABSTRACT & COMMENTARY

By John P. DiMarco, MD, PhD

Professor of Medicine, Division of Cardiology, University of Virginia, Charlottesville

This abstract first appeared in the January edition of Clinical Cardiology Alert. *Dr. DiMarco is a consultant for Novartis, and does research for Medtronic and Guidant.*

Source: Hohnloser SH, et al. Incidence of stroke in paroxysmal versus sustained atrial fibrillation in patients taking oral anticoagulation or combined antiplatelet therapy: An ACTIVE W substudy. *J Am Coll Cardiol*. 2007;50:2156-2161.

THE ATRIAL FIBRILLATION CLOPIDOGREL TRIAL WITH Irbesartan for Prevention of Vascular Events (ACTIVE W) is a noninferiority trial comparing anticoagulation with warfarin to therapy with aspirin plus clopidogrel for stroke prevention in patients with atrial fibrillation. ACTIVE W enrolled 6706 patients and is the largest atrial fibrillation anticoagulation trial completed to date. Patients in ACTIVE W could have either paroxysmal atrial fibrillation or sustained (ie, persistent or permanent) atrial fibrillation. ACTIVE W was halted when warfarin anticoagulation was observed to be superior to aspirin and clopidogrel. In this paper, Hohnloser and colleagues look at the stroke rates in paroxysmal vs other types of atrial fibrillation and examine the effects of anticoagulation in these subsets.

In ACTIVE W, 1202 patients had paroxysmal atrial fibrillation, 891 patients had persistent atrial fibrillation, and 4604 had permanent atrial fibrillation. In this paper, the patients with persistent or permanent atrial fibrillation were analyzed together as a sustained atrial fibrillation group. Patients with paroxysmal atrial fibrillation were slightly younger, had a shorter history of atrial fibrillation, more commonly had hypertension as their primary cardiac diagnosis, and had less valvular disease, heart failure, and diabetes compared to ACTIVE W patients with sustained atrial fibrillation. Their mean CHADS 2 risk score was also lower (1.79 ± 1.03 vs 2.04 ± 1.12).

During a median follow-up of 1.3 years, there were 25 strokes and 4 non-CNS systemic embolic events among the 1202 patients with paroxysmal atrial fibrillation, compared with 136 strokes and 20 non-CNS systemic embolic events in the 5495 patients with sustained atrial fibrillation. This yields an embolic event rate of 2.0 per 100 patient years in patients with paroxysmal atrial fibrillation compared with 2.2 in patients with sustained atrial fibrillation (relative risk 0.87, 95% confidence interval 0.59 to 1.30, $P = 0.50$). After adjusting for baseline variables, the relative risk was 0.94. There was no difference in the incidence of stroke and non-CNS systemic embolism according to treatment allocation, based on the type of atrial fibrillation. Oral anticoagulation was superior to clopidogrel plus aspirin for the prevention of stroke and non-CNS embolism in both types of atrial fibrillation. The relative risk for stroke or non-CNS systemic embolism was 2.09 in the aspirin plus clopidogrel group among those with sustained atrial fibrillation and 1.61 among those with paroxysmal atrial fibrillation. Bleeding rates were higher on clopidogrel and aspirin, but there was no difference in bleeding rates based on the pattern of atrial fibrillation.

Hohnloser et al concluded that patients with paroxysmal and sustained atrial fibrillation have similar risks for stroke and non-CNS embolism, and that oral anticoagulation is more effective than antiplatelet therapy in both types of atrial fibrillation.

■ COMMENTARY

The prior evidence for recommendations of anticoagulation in patients with paroxysmal, as opposed to sustained, atrial fibrillation are based on only a small number of patients in randomized clinical trials. These trials used an older definition of paroxysmal atrial fibrillation and were conducted almost 20 years ago. Since then, stroke rates in all patients with atrial fibrillation have declined, with the decline possibly due to better therapy of hypertension and associated conditions. In this paper, however, Hohnloser et al show that paroxysmal atrial fibrillation, using a current definition, carries the same risk for stroke as does sustained atrial fibrillation, at least in patients with enough atrial fibrillation to warrant entry into the trial.

The major questions in dealing with patients with paroxysmal atrial fibrillation is the lower limit of frequency or duration of atrial fibrillation that is required to increase the risk of stroke. This paper shows that paroxysmal or self-terminating episodes have approxi-

mately the same prognostic significance as sustained episodes, but the paper does not provide a true estimate of atrial fibrillation burden in these patients. It is still unknown whether patients with only rare or very short episodes are also at increased risk. In clinical practice, an estimate of total atrial fibrillation burden is impossible in most patients since it is well recognized that silent episodes of atrial fibrillation are frequent. There is, however, a study ongoing that is using pacemaker memory to document the prevalence of symptomatic and asymptomatic runs of atrial fibrillation (correlating this with the risk for stroke). ■

Pharmacology Update

Niacin/simvastatin Extended-Release Tablets (Simcor®)

By William T. Elliott, MD, FACP, and James Chan, PharmD, PhD

Dr. Elliott is Chair, Formulary Committee, Northern California Kaiser Permanente; Assistant Clinical Professor of Medicine, University of California, San Francisco; Dr. Chan is Pharmacy Quality and Outcomes Manager, Kaiser Permanente, Oakland, CA.

Drs. Chan and Elliott report no financial relationship to this field of study.

THE FDA HAS APPROVED EXTENDED RELEASE NIACIN plus simvastatin as a combination product. Along with niacin/lovastatin that was approved in 2001, this represents the second niacin/statin combination for the treatment of hyperlipidemia. The new product combines two widely used drugs, simvastatin and extended-release niacin (Niaspan). It is marketed by Abbott Laboratories, Inc. as Simcor.

Indications

Niacin/simvastatin is indicated to reduce elevated total cholesterol, LDL-cholesterol, Apo B, non-HDL cholesterol and triglycerides (TG) or to increase HDL-cholesterol in patients with primary hypercholesterolemia and mixed dyslipidemia when monotherapy with simvastatin or niacin extended-release is considered inadequate. It is also indicated to treat hypertriglyceridemia (Fredrickson type IV hyperlipidemia) when simvastatin or niacin alone is inadequate.[1]

Dosage

The recommended starting dose for either naïve patients or those switching from extended-release niacin is 500 mg of niacin and 20 mg of simvastatin once daily. Maintenance dose ranges from 1000/20 mg to 2000/40 mg. The dose may be titrated by increments not exceeding 500 mg of niacin every 4 weeks. Doses above 2000/40 mg are not recommended. The tablets should be taken at bedtime with a low-fat snack. Aspirin or ibuprofen taken 30 minutes before dosing may minimize flushing.[1]

Niacin/simvastatin is available as 500/20 mg, 750/20 mg, and 1000/20 mg tablets.

Potential Advantages

Niacin/simvastatin 1000/20 mg and 2000/40 mg combinations are more effective in reducing non-HDL-C than simvastatin 20 mg alone. Niacin/simvastatin is more effective, in general, than simvastatin in reducing TG and increasing HDL-C.1 Niaspan has been associated with less flushing than the immediate-release niacin formulations and may be associated with less hepatotoxicity than other sustained-release niacin preparations such as Slo-Niacin and Nicobid.2 The combination offers a more potent statin than the previously available combination (lovastatin/niacin).

Potential Disadvantages

Flushing is a common adverse event associated with niacin occurring in 59% of subjects in a controlled clinical study. This is often accompanied with dizziness, syncope, tachycardia, palpitations, shortness of breath, sweating, chills, and/or edema. Niacin is contraindicated in patients with active liver disease or peptic ulcer disease. Niacin can increase blood glucose, uric acid levels, prothrombin time and decrease platelet counts. Glucose levels should be closely monitored in diabetic or potentially diabetic patients particularly during the first few months. Myopathy and/or rhabdomyolysis have been reported with the combination of simvastatin and niacin (≥1 gram). Patients should be monitored for muscle-related symptoms (eg, pain, tenderness, weakness) after initiation of therapy or dose increase. Periodic assessment of creatine kinase levels may be appropriate. Additional benefit of niacin over simvastatin alone on cardiovascular mortality or morbidity has not been established.[1]

Comments

The combination of a statin with niacin results in significant reduction in TG and elevation of HDL-C not achieved with a statin alone. The addition of niacin (1000 mg or 2000 mg daily) to simvastatin 20 mg compared to simvastatin 20 mg alone resulted in the following changes at 24-weeks; non-HDL-C (-13.6% and -19.5% vs -5%), LDL-C (-11.9% and -14.3% vs -6.7%), total-C (-8.8% and -11.1% vs -4.5%), TG (-26.5% and -38.0% vs -15.3%), ApoB (-13.2% and -18.5% vs -5.6%), HDL-C (+20.7% and +29.0% vs +7.8%). Niacin/simvastatin

(1000/40 mg and 2000/40 mg) only showed significant changes in TG and HDL-C compared to simvastatin 80 mg. Overall, niacin/simvastatin was superior to simvastatin alone in lowering TG and raising HDL-C. Flushing is the most annoying adverse event of niacin affecting about 60% of patients. The cost of niacin/simvastatin is about 11% higher than niacin/lovastatin at equal milligram doses (eg, 1000 mg/20 mg), $3.36 compared to $3.03 per tablet respectively. At roughly equipotent doses (ie, 1000/20 mg niacin/simvastatin and 1000/40 mg niacin/lovastatin) niacin/simvastatin is about a 4% less costly, $3.36 compared to $3.52.

Clinical Implications

In comparison with the previously available niacin/statin product, niacin/simvastatin provides a product with the identical niacin formulation but with twice the statin potency. The maximum recommended dose of both niacin/lovastatin and niacin/simvastatin are 2000/40 mg. While the benefit of combination therapy in terms of cardiovascular mortality and morbidity has not been established, the addition of extended-release niacin to background statin therapy has been reported to induce atherosclerosis regression as measured by carotid intima-media thickness (CIMT) and slowed the progression of atherosclerosis among individuals with known coronary heart disease and moderately low HDL-C.[3,4]

References

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4. Taylor AJ, et al. Circulation. 2004;110(23):3512-3517.

CME Questions

10. Which is the most effective in treating common warts?
a. duct tape occlusion for 7 days, repeat as necessary for 2 months
b. moleskin occlusion for 7 days, repeat as necessary for 2 months
c. cryotherapy with liquid nitrogen, repeat as necessary every 3 weeks
d. salicylic acid applied daily for 6 weeks
e. all are equally effective

11. Choose the incorrect response. In the study of dementia and mortality:
a. survival time for women was less than men.
b. the median age of onset of dementia in men was 83 years.
c. mini-mental status examination score did not predict death.
d. men were more likely to die than women.
e. the median age of death in women was 90 years.

12. Compared to a single anterior-posterior flat abdominal X-Ray (KUB), how much more radiation may be delivered to a single organ with an abdominal CT scan?
a. 10 times more
b. 20 times more
c. 30 times more
d. 40 times more
e. 50 times more

Answers: 10 (e); 11 (a); 12 (e)

CME Objectives

The objectives of *Internal Medicine Alert* are:
- to describe new findings in differential diagnosis and treatment of various diseases;
- to describe controversies, advantages, and disadvantages of those advances;
- to describe cost-effective treatment regimens;
- to describe the pros and cons of new screening procedures.

Clinical Briefs

By Louis Kuritzky, MD, Clinical Assistant Professor, University of Florida, Gainesville

Dr. Kuritzky is a consultant for GlaxoSmithKline and is on the speaker's bureau of GlaxoSmithKline, 3M, Wyeth-Ayerst, Pfizer, Novartis, Bristol-Myers Squibb, AstraZeneca, Jones Pharma, and Boehringer Ingelheim.

Does Published Evidence Reflect the Whole Story?

Currently, when industry applies to the FDA for new drug licensing, they must register all trials performed, whether published or not. The evidence base readily available to clinicians often does not contain all of these trials; hence concern has been raised that non-published trials might have outcomes less favorable to sponsor interests, thereby providing a more rosy portrait of efficacy in the published literature than in the total evidence base.

Turner et al chose to consider clinical trials of FDA-approved antidepressants. They examined 74 studies that had been registered with the FDA. Among these clinical trials, half were positive, and all but 1 of these was published. Of the remaining 37 negative trials, 22 were not published. Some of the negative trials (n = 11) that were published portrayed outcomes in an overly optimistic light according to the assessment of the authors.

"Publication bias" is the term used to account for the variability in likelihood that a study will achieve published status due to some particular characteristic, rather than on the merits of its scientific integrity alone. Trials with a positive outcome (Drug A is better than Drug B for Disease X) are more likely to be published than negative trials (Drug A failed to improve the outcome of disease X); a failed trial (Drug A did not achieve its primary endpoint, but secondary endpoints are favorably hypothesis-generating) has historically fared similarly.

The authors suggest the efficacy of antidepressants as demonstrated in published clinical trials is more robust than would be concluded on the basis of the entirety of clinical trial experience. ■

Turner EH, et al. N Engl J Med. 2008;358:252-260.

Vitamin E levels and Physical Decline with Aging

Most of us anticipate that our older years will be associated with a decline in physical function. The graying of America is associated with a decline to the level of disability for some, which reduces quality of life and taxes the health care system. The SPPB (Short Physical Performance Battery) is a tool that quantifies the progression of functional decline.

Using a suburban population of seniors (>age 65) from Florence, Italy, investigators followed 698 subjects for 3 years. In addition to monitoring with the SPPB, the micronutrients vitamin B6, vitamin B12, vitamin D, vitamin E, and folate were measured.

After adjustment for confounders, multivariate analysis found a significant relationship between lower vitamin E levels and physical decline, but none of the other micronutrients demonstrated a meaningful relationship after multivariate analysis.

Based upon this data, the authors conclude that a relationship between lower vitamin E levels and physical decline has been demonstrated. Whether the relationship between vitamin E and physical function is causally related is not established by this longitudinal observational trial. Even if vitamin E is someday determined to affect physical decline, the clinical trials to date have been discouraging about other cardiovascular outcomes in persons supplemented with vitamin E. ■

Bartali B, et al. JAMA. 2008;299(3):308-315.

Effort, Efficacy, and Effectiveness

The vicissitudes of enabling lifestyle changes to effect reductions in blood pressure are sufficiently well accepted that clinicians may be tempted to sidestep this phase of management in preference for the more routinely effective pharmacotherapies. Recall that the distinction between "efficacy" and "effectiveness," in evidence-based-medicine parlance, is that the former refers to outcomes seen in a controlled clinical trial, and the latter to outcomes seen/anticipated in the hands of the typical community clinician. Even though the efficacy of lifestyle interventions is well established, clinicians may wonder whether it is worth the effort to try and achieve the effectiveness that might be attained in the typical practice setting.

The Behavior Risk Factor Surveillance System, administered under the auspices of the CDC, has indicated that 90% of hypertensive adults reported receiving advice about lifestyle modification for blood pressure control (n = >27,000).

When comparing those who did vs those who did not recall receiving clinician advice about behavior modification, those who recalled advice from their clinician were over 1.6 times more likely to have modified their behavior. In other words, our efforts do impact effectiveness. ■

Viera AJ, et al. J Clin Hypertens. 2008;10;105-111.

Not Just Heart Failure

By Ken Grauer, MD, *Professor, Department of Community Health and Family Medicine, University of Florida*
Dr. Grauer is the sole proprietor of KG-EKG Press, and publisher of an ECG pocket brain book.

Dr. Grauer reports no financial relationship to this field of study.

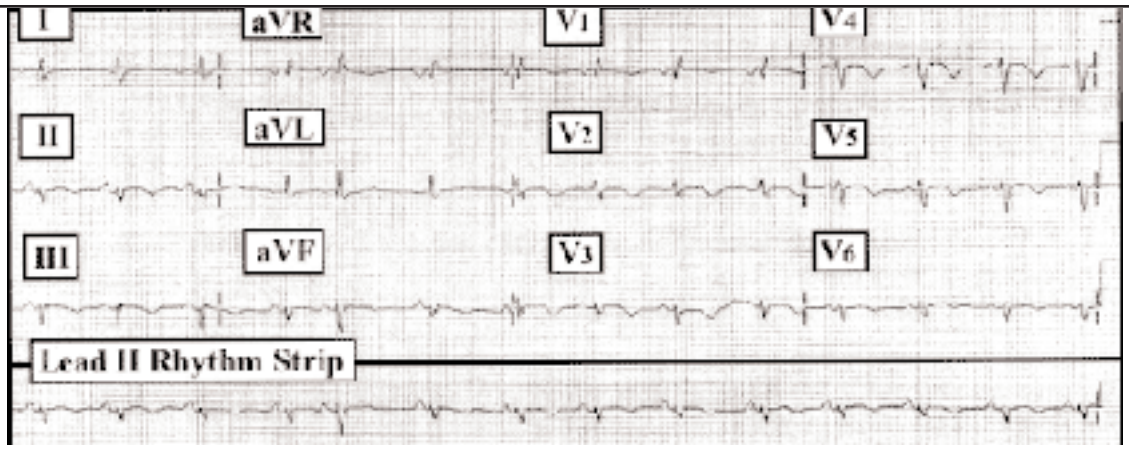

Figure: 12-lead ECG and lead II rhythm strip obtained from a 90-year-old woman with acute dyspnea and diaphoresis.

Clinical Scenario:

The 12-lead ECG and lead II rhythm strip in the Figure was obtained from a surprisingly spry and fit 90-year old woman, who presented with shortness of breath and diaphoresis at the time this tracing was recorded. Her blood pressure was 90 systolic. She was not having chest pain. Although initially thought to be in heart failure, something else was the inciting event. What *two* entities does this ECG suggest?

Interpretation/Answer:

The lead II rhythm strip shows sinus arrhythmia with one PAC (premature atrial contraction) that is conducted with aberration. Overall QRS voltage on the 12-lead tracing is reduced. The PR and QRS intervals are normal, but the QT interval appears to be slightly prolonged in lead V2 (ie, *more* than half the R-R interval in this lead). There is marked LAD (left axis deviation), consistent with LAHB (left anterior hemiblock), since the QRS complex is predominantly negative in lead II. There is no ECG evidence of LAE (left atrial enlargement) or LVH (left ventricular hypertrophy). Deciding on right-sided chamber enlargement is more difficult, as we will see momentarily. Although Q waves are absent, there is diffuse ST segment coving (with a hint of ST elevation) and T wave inversion. Given the clinical scenario, acute evolving myocardial infarction has to be considered as one possible etiology for this patient's presenting symptoms. However, serum troponins were negative and the patient did not evolve acute infarction. The clue to the real problem lies with assessment of the QRS complex in lead V1, which shows a qR pattern consistent with IRBBB (incomplete right bundle branch block) and/or RVH (right ventricular hypertrophy). While not quite meeting criteria for RAE (right atrial enlargement), the P wave in lead II is nevertheless peaked. Thus, the shape of the P wave suggests "P pulmonale", even though P wave amplitude falls short of the required 2.5 mm). Considering the clinical context of acute dyspnea in an elderly patient with low QRS voltage, near P pulmonale, IRBBB, and marked axis deviation — the inferior and anterior T wave inversion may reflect right ventricular "strain" from an acute pulmonary pattern. The patient turned out to have extensive pulmonary embolism. Nitroglycerin was held, diuretics were balanced with gentle IV fluid infusion to maintain her blood pressure, and she was anticoagulated. Amazingly, the patient stabilized and fully recovered. Moral of the case: Inferior and anterior T wave inversion is not always ischemic in nature; it sometimes reflects *right-sided* "strain" which may suggest a primary *pulmonary* problem. ■

In Future Issues: **Vitamin D Deficiency and Cardiovascular Disease**