

makes control of the quality of blood extremely difficult.

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The H98 cells used in the screening were provided by Robert C. Gallo, MD.

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Differences in the Prevalence of *Chlamydia trachomatis* Reported by Two Laboratories Using the Direct Immunofluorescence Test

To the Editor.—Over a two-year period, unforeseen circumstances led us to use two different microbiology laboratories for *Chlamydia trachomatis* testing by the direct immunofluorescence method. The large disparity in the results obtained from the two laboratories illustrates the need for standards to ensure the quality of this test.

Study.—Between January 14, 1985, and April 29, 1985, we tested patients with and without cervicitis for the presence of *C trachomatis* using the direct immunofluorescence test. Patients were seen in three family practice offices and a family planning center. The testing was performed at a private microbiology laboratory in Salt Lake City. The rate of detection of *C trachomatis* in the patients with and without symptoms of pelvic infection was 3% (6/194). After the study was concluded, the direct testing for *C trachomatis* infections in our family practice center reverted to a local laboratory we had used previously. Surprisingly, the positive rate for *C trachomatis* in our community-based population of women with and without signs of cervicitis was 33% (51/156) while using that laboratory. We subsequently had all direct immunofluorescence tests for *C trachomatis* done at the microbiology laboratory used during the original study period and the positivity rate for this organism by direct testing reverted to 7% (16/241). Statistically, the results from the first laboratory used differed significantly from those of the second laboratory ($\chi^2 = 55$; $P < .00001$). The results obtained at the first laboratory during the two different time periods did not differ significantly ($\chi^2 = .09$; $P = .8$).

Comment.—Several differences between the two laboratories may have influenced the accuracy of the results. Reagents used by the laboratories came

from two different manufacturers, which used monoclonal antibodies targeted to different binding sites of the chlamydial organism. Furthermore, there were discrepancies in the training, experience, and supervision of microbiologists and technologists performing the tests. Finally, the quality control measures used at the two sites were not comparable.

The direct immunofluorescence test for detecting *C trachomatis* has good sensitivity and specificity when compared with McCoy cell culture techniques.¹ However, without guidelines for quality assurance in performing and interpreting this test, the results achieved in an individual laboratory may not reflect the sensitivity and specificity described in the literature. Quality control standards are needed to ensure dependable performance at laboratories where this test is offered.² Until such standards are established, physicians using this test need to be aware of the prevalence rates for *C trachomatis* reported by the laboratory they use and the similarities or differences between these rates and reported rates in comparable populations.

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Diabetes and Carbohydrates: The Copper Connection

To the Editor.—Bantle et al¹ show in a crossover study that after eight days on diets providing approximately 35% of energy as starch plus an additional 20% as fructose, sucrose, or starch, diabetics had lower plasma glucose levels when fructose was the added carbohydrate. Their work suggests that the source of dietary carbohydrates may affect glucose metabolism following food consumption. Interestingly, the animal literature has recently added copper as a new dimension to the carbohydrate/diabetes interaction. Reiser et al² have demonstrated that copper-deficient rats have significantly higher blood glucose levels after an oral glucose load compared with copper-supplemented rats. Adipocytes from copper-deficient rats bound less insulin than did cells from copper-fed rats, regardless of the carbohydrate source.³

While copper deficiency may induce glucose intolerance, fructose feeding

may induce clinical copper deficiency. Human subjects fed fructose as 20% of their diet developed biochemical evidence of decreased copper status.⁴ In addition, cardiac rhythm disturbances occurred with unexpected frequency. These cardiac dysrhythmias may have been precipitated by the high-fructose diet or the resultant copper deficiency. There is growing concern that the average American copper intake may be less than optimal. Marginal copper status may be exacerbated by fructose feeding.

It would appear that although species uniqueness may exist, copper status should be considered in long-term studies of carbohydrates in diabetes patients. Stated copper concentrations in foods are inadequate for estimating daily copper intakes. Only actual food analysis by atomic absorption spectrophotometry will provide accurate information. Since 90% to 95% of serum copper is bound to ceruloplasmin, an acute-phase reactant protein, another index of copper status should be used. Probably the best choice is superoxide dismutase in the erythrocyte.⁵

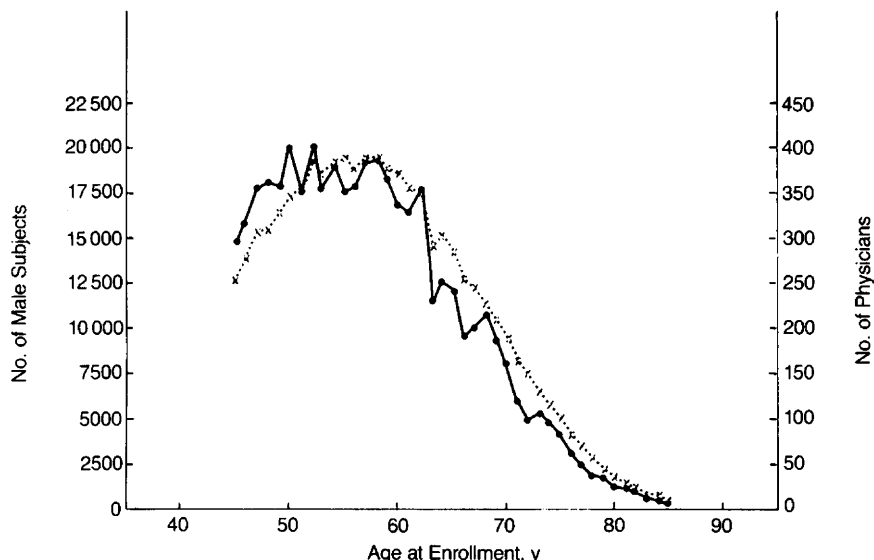
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Patterns of Reported Age: Lack of Digit Bias (and No Holding)

To the Editor.—Nichols et al¹ reported a substantial digit bias (toward multiples of five) in the age distribution of physicians and plaintiffs involved in malpractice claims, and a most peculiar bias toward the single ages of 39 and 59. They advised that "physicians and others concerned with age-related problems should be aware of this when collecting and analyzing data."

Since age is nearly always a critical variable in epidemiologic studies, it is important to know whether this is a widespread phenomenon. The Cancer Prevention Study II (CPS-II)² is a six-year follow-up study of over 1.2 million



Age distribution of all male subjects (N = 470 846; dashed line) and male physicians (N = 8893; solid line) aged 45 to 85 years (inclusive) at time of enrollment in Cancer Prevention Study II in 1982.

men and women, mostly aged 45 years and older. We recently reported the smoking habits of physicians in CPS-II by age and sex.³ The Figure shows the age distribution for all 470 846 men and for 8893 male physicians aged 45 to 85 years (inclusive) when they were enrolled in CPS-II in late 1982. Corresponding distributions for all women and for female physicians were similar.

The distribution for all men is monotonic until age 52 years, then shows three relatively small single-year fluctuations from monotonicity at 53, 56, and 64 years. The distribution for the physicians shows larger fluctuations, with unexpected peaks at even-numbered ages (50, 52, 54, 58, 62, and 64 years). The observed year-to-year fluctuations are trivial and of no epidemiologic consequence. These fluctuations are larger in the physician subsample than in the group as a whole because the number of physicians is comparatively small.

Nichols et al, like us, have measured the prevalence of age in specific populations. Prevalence is determined by year of birth and survival to study time, and is also affected by selection factors. Birth rates may fluctuate from one year to another, different diseases may attack successive birth cohorts at different rates, and the technology for curing potentially fatal diseases does not change smoothly. Therefore, there is no a priori reason to expect a perfectly smooth distribution of birth years in a cross-sectional study population.

We know of several factors influencing participation in CPS-II, but none

that would affect age at the level of single years. Neither among the 1.2 million total subjects nor among the 11 000 male and female physicians did we see any evidence of the gross 39/59 bias reported by Nichols et al.

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Venous Catheter-Related Thrombosis and Infection

To the Editor.—The report by Chakravarthy et al¹ in *JAMA* describes an interesting cardiac complication of chronic central venous access but misses the true lesson of the case, the prevention and treatment of catheter-related thrombosis and infection. Fever and evidence for central venous thrombosis were present for months prior to the terminal hospitalization of the patient. It is therefore not surprising that advanced venous thrombosis with extension to the tricuspid valve was found. The authors fail to discuss the diagnosis of the underlying problem, catheter-related septic central venous thrombosis.

The diagnosis of catheter-related septic central venous thrombosis is predicated on symptoms and signs of systemic sepsis, blood cultures that continue to be positive even after catheter removal, and central venous throm-

bosis, best confirmed by venography.² The syndrome is probably underdiagnosed in the seriously ill population at risk with prolonged catheterization, and no more than 50 well-documented cases have been described in the medical literature. The treatment is removal of the offending catheter, anticoagulation therapy with heparin to limit extension of the thrombosis, and a prolonged course of intravenous antibiotics to treat the endovascular infection. Had this complication of a Hickman catheter been recognized, the patient might have survived.

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Dr Mom

To the Editor.—"Dr Mom" found only exhaustion and frustration as she tried to raise a family and pursue a career in medicine. Yet there are some among us, male and female physicians alike, who are enjoying both family and career at the same time.

Most of us rely on the support of our spouses, and together we plan our career choices to meet the needs of both individuals. Of course, if one spouse chooses to pursue a position that requires truly "workaholic" dedication, that person—male or female—can meet the children after high school graduation. Others of us find a niche that allows one to find professional and family satisfaction.

We are both full-time pediatricians, with the hours and on-call schedule that this implies. We work together, and every responsibility in our lives is taken by the more willing soul, be it laundry or a neonatal resuscitation. Our children successfully went from day care to school-age, and we doubt there are happier or more well-adjusted children, or a closer family, to be found anywhere.

Our situation is not unique. We held other positions before we entered private practice, and we would have found other solutions for our needs if we were elsewhere today.

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To the Editor.—I take issue with the article by Dr Levy¹ of North Chicago, Ill, who said essentially that one could not be a well-adjusted physician,