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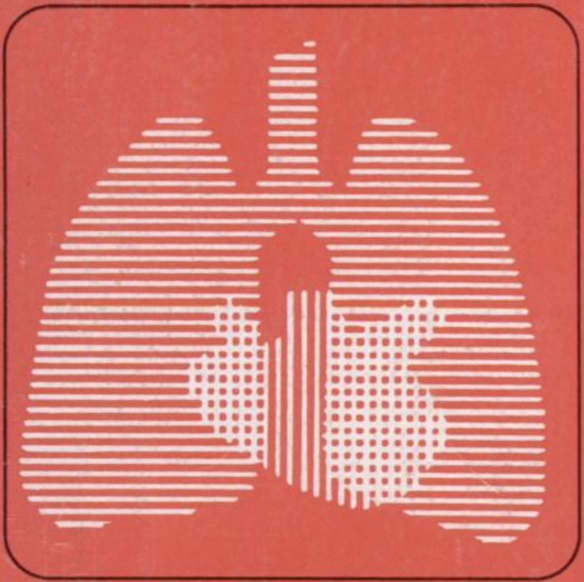

CHEST

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Cystic Fibrosis

Psychosocial Status of Adults with CF
Shepherd and associates
Editorial comment by Norman J. Lewiston

Respiratory Dysfunction in CF
Browning, D'Alonzo, Tobin

Therapy for Hemoptysis in CF
Sweezey, Fellows

Congestive Heart Failure and Pleural Fluid

Vesely, Winters, Sallman

Nedocromil Therapy of Asthma

A Multicenter Study

Critical Care

Oxygen Therapy in Ventilator-dependent Patients
Jubran, Tobin

Ventilators and Chest Tube Occlusion
Blanch, Koens, Layon

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A Comparative Study of the Psychosocial Assets of Adults with Cystic Fibrosis and Their Healthy Peers*

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Robert M. Kaplan, Ph.D.

Psychosocial assets of 37 adults with cystic fibrosis (CF) and 46 of their healthy peers were assessed by mailed questionnaire. Major sociodemographic variables did not differ significantly between the two groups, nor did indices of emotional social support, social network density, self-esteem, or current life satisfaction. This study revealed adults with CF to function on a par with their healthy peers in nearly all respects, a finding at odds with those from uncontrolled studies and which suggests to us that many previous conclusions about the psychosocial health of adults with CF have been unwarranted. Future psychosocial studies involving patients with CF should include control groups and inferences about the effect of these patients' physical illness on their psychosocial health should not be made in the absence of normative data.

(Chest 1990; 97:1310-16)

TSCS = Tennessee Self-Concept Scale; SPSS = Statistical Package for the Social Sciences; CPT = chest physiotherapy

An ever-increasing number of patients with cystic fibrosis (CF) are living to adulthood.[1,2] An abundance of data is available describing the medical and physiological facets of CF in adults. However, considerably less is known about the social and psychological status of adults with CF. More such information is needed,[3] in part so that both researchers and clinicians may make more informed judgments about the degree to which an individual's physical health is affecting his or her psychosocial functioning.

For editorial comment see page 1282

The few studies that have examined the psychosocial status of adults with CF have generally adopted one of two research methods. The earliest approach was the uncontrolled descriptive report. This technique was used by Boyle et al[4] and Strauss and Wellisch[5] and the results of both studies portrayed adults with CF as highly troubled in many areas. More recently, two research teams have sought to overcome the lack of control groups through the use of standardized tests. Cowen et al[6] used the Tennessee Self-Concept Scale (TSCS) and found older patients with CF to have essentially normal self-concepts. Moise et al[7] also used the TSCS, along with a psychological screening inventory and a measure of coping style, and concluded that the adults with CF studied had age-adequate psychological functioning. These two studies portray adults with CF as substantially less deviant than previously suggested, but neither assessed such traditional psychosocial assets as social support.

To our knowledge, only one study examining the psychosocial functioning of adults with CF has made use of a healthy comparison group, and this study was limited to an investigation of the sexual health of single adults.[8] The purpose of our study, therefore, was to compare adults with CF with their healthy peers across a broad range of psychosocial measures.

METHODS

Subjects

Eligible subjects with CF were 18 years of age or older, English speaking, had confirmed diagnoses of CF on the basis of positive sweat tests, and were being actively followed by the Cystic Fibrosis Center at the University of California, San Diego (UCSD). Of 55 patients meeting these criteria, 37 agreed to participate. Consistent with the disproportionately high prevalence of CF among whites, all CF subjects were white.

Recruitment for the comparison group was conducted at local colleges and businesses. Comparison subjects were required to be between the ages of 18 and 45 years, to be free of chronic disease (as determined by self-report), to be nonsmokers (because of the assumption that few CF subjects would be smokers), and to be English speaking. Data from the 46 white subjects recruited into the comparison group form the basis for the analyses reported herein.

The study protocol was approved by the human subjects committees of UCSD and San Diego State University. All subjects provided informed consent.

Instruments and Variables

Data were obtained by means of mailed questionnaires composed of closed-ended questions. For CF subjects a medical chart review

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Table 1—*Comparison of CF Adult Participants with Other CF Adult Samples in the Published Literature*

Reference and CF Center	Sample Description	Living Arrangements (% Living With)	Marital Status (% Married)	% With Dependents	Employment/Student Status (%)	Hollingshead Occupational Status (%)	Hollingshead Social Class Rating (Mean)	% Vital Capacity (Mean ± SD)	Education Years (Mean)
Shepherd et al (present study), San Diego	N 37 Age, yr Mean 27.2 Range 19-44 % Male 76	Parents 38 Spouse or significant other 35 Alone 19 Others 8	22	24	Employed 51 FT 38 PT 13 Student 43 FT 19 PT 24	Professional managerial/administrative 39 Clerical/sales 28 Other 33	3.1	70±25	14.2
Cowen et al[6] Toronto (respondents only)	N 105 Age, yr Range ≥20 % Male 72	Parents 30 Spouse 41 Alone or others 29	41	11	Employed 78 FT N/A PT N/A Student 15 FT N/A PT N/A	Professional/managerial/administrative 34 Clerical/sales 18 Other 48	. . .	69±26 (male) 68±28 (female)	. . .
Strauss and Wellisch[5] UCLA	N 21 Age, yr Median 23 Range 18-33 % Male 57	Parents 33 Spouse or significant other 24 Alone 33 Others 10	24	. . .	Employed 62 FT 52 PT 10 Student 32 FT 27 PT 5	. . .	. . .	. . .	. . .
Di Sant'-Agnese and Davis,[14] NIH	N 75 Age, yr Mean 24.2 Range 18-47 % Male 55	. . .	69 (subjects ≥25 years old only)	. . .	Employed or student FT 71 PT 16	. . .	. . .	. . .	. . .
Boyle et al,[4] NIH	N 13 Age, yr Mean 24.2 Range 19-30 % Male 54	Parents 38 Spouse, alone, or others 62	46	15		. . .	. . .	. . .	14.2
Moise et al,[7] Cleveland	N 73 Age, yr Mean 24.9 Range 18-40 % Male 64	. . .	33†	. . .	Employed 77‡ or student FT or PT	. . .	3.5	. . .	. . .

*FT = full time; PT = part time, N/A = not applicable.

†Includes patients "involved in longstanding relationships"; the comparable figure for San Diego is 35 percent.

‡The comparable figure for San Diego is 73 percent. This is less than the sum of employed patients plus students in school because some patients are both employed and in school.

was also conducted to obtain data on pulmonary function. Sociodemographic variables assessed included marital status, number of dependents, source of financial support, income, educational attainment, occupation, and employment status. Social class was assigned using the Hollingshead Two-Factor Index of Social Position,[9] with some occupational status ratings adjusted up or down based on changes in status suggested by more recent ratings.[10]

The emotional quality of a subject's social support was measured by the Family APGAR, a five-item scale measuring the familial support and nurturance available to a respondent.[11] The APGAR's original three response choices were expanded to five to make the number of response options consistent with other items in the questionnaire. Answers from the five APGAR questions were summed to form an index of emotional social support.

The density or number of social relationships in which a subject was involved was assessed by means of six questions adapted from the Social Health Battery used in the Rand Health Insurance Study.[12] These questions asked about the frequency of telephone contact with friends or relatives, frequency of visiting or engaging in recreational activities with friends or relatives, frequency of church attendance, and numbers of close friends. Answers were summed to form an index of social network density.

An index of current life satisfaction was created by summing the answers to three questions suggested by the instrument used previously by Strauss and Wellisch.[5] These questions asked how frequently subjects felt lonely, how satisfied they were with their sexual activities, and how satisfied they were with the recent course of their life. A fourth index was created from three questions exploring aspects of self-esteem. These questions asked subjects to rate the degree to which they felt they were currently using their education and talents, to indicate how they felt about this situation (*eg*, very satisfied to very frustrated), and to rate the degree to which they felt their current work or activities contributed to society.

Additional CF Group Variables Measured

Subjects with CF were asked about several other variables for which comparisons with healthy people are not possible. The CF-related informational social support was measured by asking how

Table 2—*Comparison of CF Adult Participants Aged 25 and Older with Other CF Adult Samples Aged 25 and Older in the Published Literature*

Reference and CF Center	Sample Description		Marital Status (% Married)	% With Dependents	Hollingshead Occupational Status (%)		% Vital Capacity (Mean)	FEV$_1$ (Mean)	College Graduates (%)	Employed or Student Full-time (%)
Shepherd (present study) San Diego	N	23	35	30	Professional managerial/ administrative	43	72	48	22	44
	Age, yr									
	Mean	30.9								
	Range	25-44			Clerical/sales	26				
	% Male	78			Other	30				
Shwachman et al,[15] Boston	N	70	60	21	Professional managerial/ administrative	51	75	52	. . .	. . .
	Age, yr									
	Mean	29.3								
	Range	25-43			Clerical/sales	29				
	% Male	67			Other	20				
Fink et al,[16] Cleveland	N	40	38	. . .			74	48	63	81 (applies only to 32 "current survivors")
	Age, yr									
	Mean	27.0								
	Range	25-39								
	% Male	68								

many other CF adults a CF subject knew, socialized with, and talked with about CF.

Medication compliance was assessed by asking subjects how often they took all of their prescribed drugs. Response options were in the form of percentages of time (*eg*, about one fourth of the time or less). The same approach was taken in inquiring how frequently patients did daily chest physiotherapy (CPT). The reliability of these answers was assessed by asking significant others (see Granger et al[13] for details) similarly phrased questions regarding their perceptions of their CF partners' compliance. Status as an exerciser was assessed on the basis of a yes or no answer to a question asking subjects whether they followed a regular exercise program.

Analysis of Group Differences

Data analyses were performed using the Statistical Package for the Social Sciences (SPSS). Evidence of statistically significant between-group differences was sought using χ^2 tests for discrete variables and t tests for continuous variables. For the indices, mean scores for each component question were compared, as well as the mean index scores.

RESULTS

Comparison of CF Participants with Other Samples of CF Adults

On none of the demographic or health variables available for comparison were there significant differences ($p>.05$) between the 37 adults from the UCSD CF Center who chose to participate in the study and the 18 who chose not to participate. These variables included proportion of each group that was male, proportion married, mean age, mean percentage of ideal body weight, mean percentage of predicted slow vital capacity, proportion of each group that had been hospitalized in the preceding year, mean number of days hospitalized in the preceding year, and mortality rate one year after recruitment.

Summaries of published studies describing various sociodemographic and psychosocial variables in adults with CF are shown in Tables 1 and 2. Pulmonary function is remarkably consistent among the samples summarized. Mean vital capacity scores at the San Diego and Toronto[6] CF Centers are nearly identical, as are means for vital capacity and FEV$_1$ for CF adults aged 25 and older at San Diego, Boston,[15] and Cleveland.[16] The samples also have similar age distributions. Living arrangements appear similar for the San Diego subjects and the other samples for which data are available: Toronto,[6] UCLA,[5] and National Institutes of Health (NIH).[4]

San Diego does have a greater preponderance of adult men than centers elsewhere. Compared with other centers, it also appears that a smaller percentage of the San Diego participants were employed, although the distribution of occupational status ratings among those having ever entered the work force is similar to that of Toronto[6] and Boston[15] and the percentages of patients in San Diego who were working or in school at least part time were similar to those in the Cleveland sample of Moise et al.[7] Among older CF adults in San Diego, only 22 percent had graduated from college, whereas 63 percent had done so in the Cleveland sample of Fink et al.[16] Such a discrepancy is hard to explain given that the San Diego sample and the NIH sample described by Boyle et al[4] had identical mean years of education. San Diego had the smallest percentage of married subjects but appeared not to differ substantially in this respect from other samples at the lower end of the distribution.[5,7,16]

Sociodemographic Comparison of the CF and the Healthy Group

The CF and the healthy comparison groups did not differ statistically in age, marital status, presence or

Table 3—*Sociodemographic Characteristics of CF Adult Group and Healthy Comparison Group*

Characteristic	CF Adult Group (N = 37)	Healthy Comparison Group (N = 46)	p value†
Age, yr			
Mean	27.2	27.6	.787
Range	19-44	20-46	
Sex, % male	76	46	.011
Marital status, % married	22	22	1.000
Have dependents, % with	24	26	.800
No. of dependents (mean)	.24	.26	.878
Education, yr (mean)	14.2	15.3	.019
Hollingshead social class rating (mean)	3.1	3.2	.581
Income available for support, mean scale score (4 = 20M-25M/yr)	3.9	4.3	.479

†Two-tailed *t* tests.

Table 4—*Distribution of Various Sociodemographic/Psychosocial Characteristics within the CF Adult and Healthy Comparison Groups (By Percentage)*

Characteristic	CF Adult Group (N = 37)	Healthy Comparison Group (N = 46)
Educational attainment		
College degree	14	36
Some college	65	51
No college	22	13
$\chi^2 = 5.34$; p = .069		
Student status		
Student, full-time	19	26
Student, part-time	14	26
Nonstudent	68	48
$\chi^2 = 3.45$; p = .178		
Hollingshead Occupational Status Rating*		
Professional, managerial, or administrative	42	38
Clerical or sales	30	27
Other	27	36
$\chi^2 = .60$; p = .741		
Source of financial support		
Subject	43	46
Another person	35	7
Subject and another person	22	48
$\chi^2 = 12.63$; p = .002		
Employment status		
Employed, full-time	38	54
Employed, part-time	14	24
Not working due to health	27	0
Not working for other reasons	22	22
$\chi^2 = 14.77$; p = .002		
Living arrangements		
Live with parents	38	9
Live with spouse or significant other	35	39
Live alone	19	11
Live with others	8	41
$\chi^2 = 17.56$; p<.001		

number of dependents, income, or mean social class rating (Table 3). Also, there were no significant differences in student status or distribution of Hollingshead Occupational Status Ratings (Table 4).

The CF group did have a significantly larger percentage of male subjects than the comparison group, and they averaged one year less of education; there was also a trend for members of the CF group to be less likely to have a college degree. The percentage of subjects who were financially self-supporting was nearly equal in both groups. However, CF subjects who were not self-supporting were five times more likely than members of the comparison group to be supported solely by someone else and only half as likely to make at least some contribution to their own financial support. Subjects with CF were also less likely to be employed, with the reason appearing to be exclusively health related. Finally, there was a significant difference in the living arrangements adopted by members of the two groups, with CF subjects more likely to live alone or with their parents and members of the comparison group more likely to live with nonintimate others (*ie*, roommates).

Psychosocial Comparison of the CF and the Healthy Group

None of the four psychosocial index scores differed significantly between the two groups (Table 5). When scores for the component questions of the indices were compared, significant differences between the two groups emerged for only two questions: CF subjects reported their families significantly more accepting of the subjects' "wishes to take on new activities and make changes" in their life-style, and members of the comparison group reported themselves to be significantly more satisfied with their sexual activities.

When the question concerning sexual satisfaction was analyzed by marital status, there were no significant differences between married persons in the CF group and those in the comparison group (p = .90), the mean for both married groups indicating a greater than general satisfaction with their sex lives. Unmarried adults with CF, 38 percent of whom described themselves as frustrated or very frustrated with their sexual activities, were less satisfied (p = .004) with

Table 5—*Comparison of Psychosocial Variables in the CF Adult Group and the Healthy Comparison Group*

Index	Individual Question Content	Mean Scale Scores* CF Adult Group	 Healthy Comparison Group	p value†
Emotional social support		20.7	19.4	.223
	Satisfaction with help received from family in times of trouble	4.3	4.0	.308
	Satisfaction with intrafamily problem-solving and communications	4.0	3.8	.488
	Satisfaction with family's acceptance of change in subject's life-style	4.5	4.0	.034
	Satisfaction with family's responses to subject's emotions	3.9	3.9	.851
	Satisfaction with amount of time spent with family and friends	3.9	3.8	.654
Social network density		21.4	21.2	.771
	Frequency of visits with friends and family	4.4	4.3	.815
	Frequency of recreational outings with friends and family	4.2	4.2	.915
	Frequency of telephone contacts with friends and family	5.2	5.1	.584
	Number of close friends (scale scores)	3.8	3.6	.382
	Frequency of church attendance	2.1	1.9	.593
	Number of voluntary groups and organizations belonged to (scale scores)	1.7	2.0	.088
Current life satisfaction‡		10.3	11.2	.090
	Frequency of feeling lonely	2.2	2.3	.648
	Satisfaction with sexual activities	3.1	3.8	.018
	Satisfaction with course of life recently	3.4	3.7	.127
Self-esteem		10.2	10.5	.695
	Perceptions of degree talents and training are used in current activities	3.8	3.6	.552
	Satisfaction with degree talents and training are used in current activities	3.5	3.5	.998
	Perceptions of degree current activities contribute to society	3.2	3.5	.261

*Scales are 5- or 6-point continuums; higher scores indicate higher frequencies, greater density, greater satisfaction, etc.

†Two-tailed *t* tests.

‡Scoring direction of some questions reversed for computation of index to maintain consistency of language.

their sex lives than their healthy unmarried counterparts, only 17 percent of whom expressed corresponding levels of sexual dissatisfaction.

Because of the difference in gender composition between the CF and the healthy group, the comparisons reported in Tables 3 through 5 were repeated with male subjects only and with female subjects only. In almost all instances these within-sex comparisons produced results similar to those obtained when the sexes were combined and in those few cases where the results were dissimilar there was no evidence of men with CF behaving consistently differently from women with CF vis-à-vis same-sex healthy comparison subjects (data not shown).

Additional CF Group Results

With regard to CF-related informational social support, 61 percent of the CF subjects knew at least five other people with CF; 11 percent knew none. Nineteen percent said they saw at least five other CF patients in a social capacity; 54 percent said they did not see any other patients socially. Thirty-eight percent said they had talked with five or more other CF patients specifically about CF; 27 percent had never spoken specifically about CF with another patient.

Seventy-six percent of the adults with CF reported taking all of their prescribed drugs at least 90 percent of the time, a figure that correlated highly with the estimates of drug compliance provided by the patients' significant others ($r=.66$, $p=.001$). Only 54 percent of the CF patients reported themselves as doing daily CPT at least three quarters of the time, answers again well substantiated by the significant others ($r=.74$, $p=.001$). Status as a regular exerciser was claimed by 57 percent of patients. A two-by-two contingency table showed no evidence that patients exercised in lieu of performing CPT; indeed, 24 percent of patients failed to either exercise or perform CPT regularly and 16 percent could be considered "fully non-compliant" in that they failed to take medications regularly, to exercise, and to perform CPT.

DISCUSSION

The participants with CF in this study did not seem to differ from those adults at the UCSD CF Center who chose not to participate in the study, nor do the CF participants in our study seem atypical of CF adults elsewhere. With the exception of its higher proportion of male subjects, our sample resembles published descriptions of other samples both sociodemographically and medically. Patient behaviors in our study are also similar to those reported elsewhere. Our findings concerning medication compliance are consistent with two studies involving CF children that have reported 93 and 79 percent of subjects to be in "complete compliance" with the prescribed antibiotic regimen.[17,18] Our finding that patients report themselves less compliant with CPT corresponds to objective[17] and subjective[15] observations by other researchers. Also, the finding that 16 percent of patients failed to take medications regularly, to exercise, and to perform CPT is similar to the finding of Strauss and Wellisch[5] that 19 percent of their subjects considered themselves "rarely or never willing to cooperate in their own treatment."

Our findings resemble those of Strauss and Wellisch[5] in other ways as well. Thirty-eight percent of the CF adults in the UCLA study by Strauss and Wellisch described themselves as rarely or never willing to discuss or disclose the fact that they had CF; in our study, 41 percent did so. Of the patients in the UCLA study, 57 percent reported themselves rarely or never depressed because of their CF; in our study, 68 percent. More than three quarters of the patients in the UCLA study described themselves as healthier than other adults with CF and only one patient (of 21) believed himself sicker than his peers; in our study, 69 percent of patients rated themselves as healthier or much healthier than other adults with CF and only 14 percent rated themselves less healthy than other CF adults. Strauss and Wellisch believed this tendency among individual CF patients to rate their health as better than that of other patients was evidence of "minimization," and they described this as a useful coping strategy for dealing with illness. However, patients are not alone in practicing minimization: 89 percent of the adults with CF who have a significant other participating in our prospective study[13] are described by these significant others as healthier than other adults with CF.

The importance of these similarities is that they highlight the differences in the conclusions suggested by the data when information from a healthy comparison group is also available. For instance, Strauss and Wellisch[5] concluded that a high rate of "employment and extra time at work may serve to compensate in part for lowered self-esteem and an impoverished social life" among adults with CF. However, there is no evidence that the adults with CF in our study were working at an inordinately high rate; indeed, they were less likely to be employed than were members of the comparison group. Also, there is no evidence that the patients with CF in this study suffered from lowered self-esteem: no significant differences between the CF and the healthy group emerged in response to any of the questions exploring perceived societal contributions and perceived use of talents; and there is no evidence that the CF adults in the present study had impoverished social lives: there were no significant differences between the CF and the comparison group on the social network density index or on any of its six component questions, including the questions asking about numbers of close friends and frequency of feeling lonely. Similarly, on the basis of uncontrolled psychiatric interviews, Boyle et al[4] deemed the marriages of all the married patients in their sample to be marred by instability, unhappiness, or sexual dissatisfaction. However, the married CF adults in our study were as sexually satisfied as their married healthy peers and there was no significant difference between the two married groups in their expressed satisfaction with the recent course of their lives ($p = .37$; the mean for both groups indicating a general satisfaction in this regard).

Our study does support suggestions that the activities of adults with CF are appropriate for their age.[6,15] The adults with CF in this study appeared to have an overall level of functioning on a par with their healthy peers. They had married and gained dependents at the same rates as had members of the comparison group and the occupational status attained by those who had never entered the work force was at least as good as that attained by members of the comparison group. They were also enrolled in college at rates comparable to the healthy adults. Although they had significantly fewer years of education than members of the comparison group, the recruitment of comparison group members from college campuses is apt to have biased the educational attainment of the comparison group upward.

This study also supports and extends the general findings of psychologic health found in studies using standardized tests.[6,7] On 15 of the 17 questions used to measure emotional social support, density of the social support network, current life satisfaction, and self-esteem there were no significant differences between the CF and the comparison groups—a lack of difference underscored in most cases by the similarity of the score means and by the generally high p values obtained when testing for differences.

Differences did emerge on two questions. The first showed that adults with CF considered their families more accepting of changes in life-style and the undertaking of new activities—a difference many would consider entirely healthy. The second showed members of the CF group to be less satisfied with their sexual activities. This difference, however, was due entirely to an increased level of sexual dissatisfaction among unmarried members of the CF group. Coffman et al[8] have also reported single young adults with CF to be less sexually content than members of a healthy comparison group and suggest that impaired self-image may be responsible. Given our finding that married adults with CF were as sexually satisfied as their married healthy peers, it may be that higher self-image predisposes both to marriage and to sexual satisfaction.

Despite the many points of similarity between the CF and the comparison groups found in this study, it would be naive to suggest that the presence of a progressive, life-shortening disease exacts no costs. One such cost may be an increased likelihood of impaired physical self-image and subsequent sexual dissatisfaction for unmarried, young adults. Another may be an increased risk of lowered autonomy. When two aspects of autonomy—living arrangements (with or away from parents) and financial independence—were combined and this new variable's distribution within the CF and the comparison groups examined, we found that a subset of CF adults (43 percent) enjoys as much autonomy as healthy adults, but that another (30 percent, which is significantly larger than the corresponding subset in the healthy comparison group) remains in highly dependent roles, living at home, and relying on others for financial support. Interestingly, there was no correlation ($r = -.05$, $p = .38$) in the CF group between degree of autonomy and level of physical health as measured by a functional status index.[12] This parallels findings from other studies with groups of CF adults in which physical health and psychologic health,[6] disease severity and sexual health,[8] illness severity and psychologic adjustment,[7] and pulmonary function and coping status[19] have been shown unrelated and it suggests that factors other than disease severity play a key role in determining the overall psychosocial health of adults with CF. What these factors are is unknown, but their identification should be the subject of future research.

Such research must be suitably controlled. Failure to include controls can too easily lead to inappropriate conclusions. Cystic fibrosis is a serious disease with an undeniable power to affect many aspects of a person's life. However, other conditions—medical, developmental, social, and otherwise—are similarly capable of affecting a person's life and the mere presence of a disease such as CF is insufficient cause for attributing any and all putative unusual characteristics in a person's life to the effects of his or her disease.

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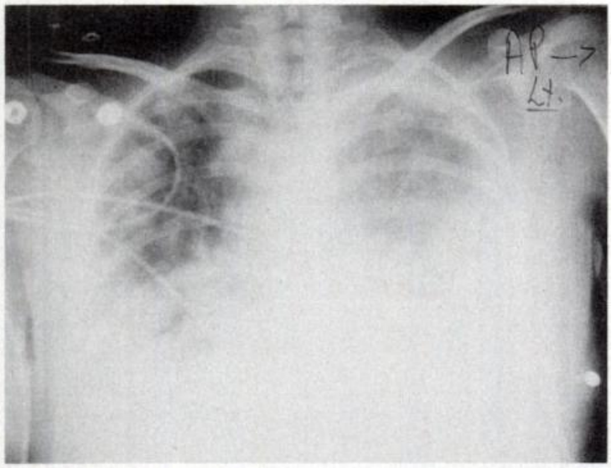

FIGURE 1

methotrexate, actinomycin-D and cyclophosphamide, with subsequently normal β-human chorionic gonadutropin level.

Common clinical manifestations of pulmonary involvement with metastatic choriocarcinoma include hemoptysis, cough, and tumor emboli. However, a less commonly appreciated presentation is with nontraumatic hemothorax.[1] Our patient demonstrates two important clinical points concerning choriocarcinoma. First, massive bilateral hemothoraces may complicate carcinomatous pleural effusion.[2] Second, in any pregnant or postpartum woman, metastatic choriocarcinoma should be considered as a cause for spontaneous hemothorax despite an apparently normal pregnancy, delivery, and otherwise negative evaluation for metastases.[3,4]

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Occupational Asthma in a Developing Country

To the Editor:

In technically less developed Third-World countries, there is very little information on the prevalence rate of occupational asthma (OA) and occupations most likely to be associated with this type of asthma.

We regularly attended to 580 adult asthmatic patients at our university teaching hospital respiratory clinic in Lusaka, Zambia; all were diagnosed with bronchial asthma according to American Thoracic Society criteria.[1] The group consisted of 320 men and 240 women. Their age range was 20 to 75 years, with a median age of 49 years.

Occupational asthma was diagnosed on the basis of the following criteria: 1) no history of asthma before commencing employment; 2) exposure to a recognized inducing agent at work; 3) symptoms of wheezing and dyspnea a few hours after exposure to the inducing agent; 4) improvement of symptoms when off work; and 5) change of employment due to persistence of symptoms.

We had only 34 patients (5.9 percent)—30 men and four women—who fulfilled the clinical criteria for the diagnosis of OA. Occupational asthma was due to employment handling chemicals in 15 patients (44.1 percent); agricultural products in 11 patients (32.4 percent); metallic products in five patients (14.7 percent); and timber by-products in three patients (8.8 percent).

The central conclusion of this study is that the prevalence rate of OA in technically less developed Third-World countries is low compared to that reported in industrialized developed countries,[2-4] especially in female patients.

Although OA in this study was not confirmed by pulmonary function tests at work and at home, or by bronchopulmonary provocation tests and immunologic tests, this study does attempt to identify occupations most likely to be associated with OA, as well as the prevalence rate of OA, in a technically less industrialized country, which is scarcely described in the literature.

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Errata

The editors of *Chest* wish to apologize to Steven L. Shepherd, M.P.H., for a typographical error that appeared in his article, "A Comparative Study of the Psychosocial Assets of Adults with Cystic Fibrosis and Their Healthy Peers" (*Chest* 1990; 97:1310-16). On page 1315, right-hand column, the following sentence appeared: "They had married and gained dependents at the same rates as had members of the comparison group and the occupational status attained by those who had *never* entered the work force was at least as good as that attained by members of the comparison group." It should have read: "attained by those who had *ever* entered the work force . . ."

In the article "Prophylactic Antibiotic Usage in Cardiothoracic Surgery" (*Chest* 1990; 98:719-23), the first sentence of the last paragraph on page 722 should read: "In this survey, the surgical membership of the American College of *Chest Physicians* clearly agrees that prophylactic antibiotics are a requirement in today's major cardiothoracic surgical procedures."

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The CF "young adult" comes of age.

N J Lewiston

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7 vs 3/7; p<.05). Though others have repeatedly shown the importance of myocardial perfusion for successful restoration of circulation,[1-9] no difference in either mean arterial pressure or myocardial blood flow was found between epinephrine-treated and norepinephrine-treated animals. The authors suggest an alternative explanation. The four animals that could not be resuscitated from the epinephrine-treated group all developed refractory ventricular fibrillation. Epinephrine, particularly in excess, may create a circumstance in which defibrillation thresholds are increased or in which recurrent ventricular fibrillation develops.

Nevertheless, further investigation seems warranted. Because of the small number of animals in this series, if one surviving animal had died or if one of the animals that died had survived, the statistical benefit favoring norepinephrine would be lost. Larger survival studies comparing these two drugs during clinically realistic conditions of cardiopulmonary resuscitation are needed. Further confirmation of this survival benefit is required before norepinephrine can be accepted as the preferred adrenergic agonist during cardiopulmonary resuscitation.

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The CF "Young Adult" Comes of Age

Cystic fibrosis (CF) can be called appropriately "a disease of the 1980s." This past decade began with this serious genetic disease in relative obscurity and ended with the discovery of the CF gene, acceptance of CF patients as candidates appropriate for lung transplantation, and survival of the majority of these patients into their third decade. Most older patients remained under the care of their pediatricians who, uncomfortable with their aging charges, coined the phrase "CF young adult." This term in some way implied that these patients were different from their peers and were to be, like Peter Pan, forever infantalized. These patients, now in their 20s, 30s, and 40s, are not happy with this and are marching in battalion strengths into the offices of internists, demanding recognition as a new patient population.[1]

The article in this issue by Shepard et al (see page 1310) is an important milestone in the progression of the image of CF patients from "unfortunate children" to "members of society with medical problems." Dating from 1977, most studies of children and adolescents have suggested that CF patients function fairly well despite their medical problems.[2] Jonathon Kellerman,[3] research psychologist turned mystery novelist, quotes some of his own work on this subject in a recent novel, *Silent Partner.* His protagonist, a psychologist/detective named Alex Delaware, is discussing some work that "he" (Delaware/Kellerman) had published on the impact of chronic illness.[4,5] "I list several problem areas chronically ill children have to deal with throughout their lives—pain and discomfort, disruption of school due to treatment and hospitalization, body changes brought about by disease and treatment, social rejection, overprotectiveness by parents. In general, children cope well with these problems, but problems still exist." The report from the San Diego (Calif) group is a well-controlled study using standard psychologic measuring instruments that extend this sort of work, with similar conclusions, to an older population.

Pulmonologists as a group are not noted for enthusiasm about the psychology literature. The value of this article is that it demonstrates that this new population does not need to be approached with kid gloves. While some of the medical problems may be unique, the patients are not "forever young," and they can be treated as perfectly competent individuals. Ten years ago, critics of this article would have pointed out that this population of CF adults probably were those who had experienced minimal disease early in their childhood or were those whose conditions had been diagnosed relatively late in life. I do not think that is the case for most CF adults today. Most have had health problems throughout their lives and still manage to function well. It is entirely possible that they are functioning well because the health care system (and now society) expects them to do so. That makes for interesting speculation that the authors were polite enough to avoid.

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Elimination of Tuberculosis in the United States

A campaign is underway to eliminate tuberculosis from the United States.[1,2] The goal of reducing the number of new cases to less than one per million population per year by the year 2010 has action committees working hard. The decline in the incidence of tuberculosis has reversed. We pulmonary physicians, who have our heritage in tuberculosis, must ensure the success of this elimination program. Because of the enormity of the problem and the complexity added by acquired immunodeficiency syndrome (AIDS), some say this aim is impossible. Because of the chance for national calamity and the complexity added by AIDS, others say it is imperative. All agree the time must be now. The effort must be complete. This dream can be realized even though it has failed so far. Patients, physicians, and society have failed, but we cannot let failure continue.

Patients fail to seek medical attention, attend clinics, and take medicines because of social stigma, expense, inconvenience, indifference, or ignorance. They may not perceive the rewards of curing tuberculosis to be as great as the nuisance of following a medical program. Patients often fail to realize they have to continue to take medicine after their symptoms are gone. Some may not care if they contract or spread this disease. Drug abuse and mental deficiency contribute to the problem. We must anticipate and prevent noncompliance. We must remind, reward, supervise, and persist.

Physicians often fail to diagnose and properly treat tuberculosis and tuberculous infection (positive purified protein derivative [PPD]). They may be indifferent, ignorant, or inexperienced. They may perceive that there is ambiguity or a lack of a standard of care. They may not act on a tuberculin test if they are confused by information about the booster effect, different cut points for the size of the skin reaction, and different times the test should be read.

Assuring compliance is a responsibility of physicians. We must check compliance, cajole compliance, demand compliance. Test with tuberculin. Treat positive skin tests, but follow closely to avoid a drug reaction. The best way to counter those who would derail tuberculosis elimination by saying the drugs are too toxic is to monitor carefully. We must teach, motivate, and enjoin other physicians in the elimination strategy.

The public and its health officials also have failed. Many people think of tuberculosis as a disease of the past. The problem has not been perceived to be urgent and many people are not aware that the tools to accomplish the task are available. Others think of tuberculosis as a disease of the disadvantaged. Expressions such as "As long as there is poverty, there will be tuberculosis" are antithetic to this cause. We must publicize and influence the allocation of resources. We must show the public that the least action is the most costly one.

AIDS makes tuberculosis more prevalent and its treatment more difficult. Immigrant and migrant populations make tracking and contact follow-up harder. Alcoholism and homelessness frustrate all aspects of tuberculosis elimination. The psychiatrically ill and