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# Use of Health Care by Chronically Ill Children in Rural Florida

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## Synopsis .....

*Factors that influence ambulatory care (visits to physicians and emergency rooms) and use of*

*hospitals were investigated in a population of chronically ill, rural, low-income children. Rates of use for this population—a stratified random sample of 672 Medicaid-eligible children under age 17 years who lived in a 24-county area of northern Florida—were similar to those in a national study of chronically ill children. Further, the rates were shown to increase significantly as limitations to activity increased. Younger children and white children were also shown to have significantly higher use rates than older children and black children.*

*Despite these associations, and those related to primary diagnoses, none of the analyses were able to explain much of the variation in the use of health care resources. The findings were similar to those of other studies; thus, the identification of the relatively small numbers of children who consume relatively large amounts of health care remains elusive.*

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**T**HE USE OF HEALTH CARE RESOURCES by American children is minimal for most children; only 5.1 percent of U.S. children under 17 years of age were hospitalized in 1981 (1). Most of the care is either routine or preventive, but a significant portion is associated with chronic illness. The patterns of use may reflect differences in access to care, as evidenced by geographic or economic barriers or both.

These are some verifiable facts about the use of pediatric health care. What is not clearly defined are the factors that influence that use, and attempts to identify and understand them have been only partially successful.

We know from published reports that children who were least likely to have received care within an adequate interval, that is, according to the guidelines developed by the American Academy of Pediatrics, (a) were from low-income families, (b) had poorly educated parents—no education beyond the eighth grade, (c) had mothers who were black, and (d) were from families of six or more persons (2-6).

Further, nearly 15 years ago a survey of children with long-term illnesses indicated that the average hospital stay per admission and per case was highest for patients living in rural areas. Among lower socioeconomic classes, the proportion of nonwhites hospitalized was considerably higher than expected, and 1 of 10 patients in every disease category experienced an unusually long hospitalization (7). A more recent study of Medicaid-eligible children confirmed the finding concerning the significantly higher medical admission rates in rural areas, especially among children with chronic conditions (8).

Although there may be data indicating that children from low-income families are less likely to receive medical care, there also are data showing that those who do are among the largest consumers of that care. According to data derived from the 1975-76 National Health Interview Survey, low-income children (children of families earning less than \$5,000 per year) were more likely to have been hospitalized and, if hospitalized, to have remained in the hospital for a longer period than

children of families with higher incomes. The low-income children averaged 610 hospital days per 1,000 children, compared with 190 hospital days per 1,000 children among families with high incomes. The average length of stay for children of low-income families was 8.5 days, compared with 3.9 days for children of high-income families. Contributing to this high hospitalization rate may be the physician's tendency to hospitalize children when conditions for caring for them at home are poor (9).

Reports of the influence of single- versus two-parent families are mixed. Some studies show more visits to physicians among single-parent families (10); some show more among two-parent families (5); and others, no difference (11). Other findings have shown that children in households without fathers were more likely to be in families that were poor, and they spent, on the average, twice as many days in the hospital as children from two-parent families (9).

But all those studies were of populations having a variety of characteristics, and they were investigations made simultaneously of an assortment of variables such as stress, ethnicity, familiarity with illness, usual source of care, insurance status, and parents' employment. Hence, the results may not be directly comparable. Also, in virtually all those studies, the amount of variation in use of health care explained by all these factors combined was low, often not exceeding 20 percent.

One reason for the rather modest success in past attempts to identify the factors that influence the use of pediatric care may be that most studies included children who were using medical services primarily for well or preventive care, as well as children who required care for acute episodes of illness or chronic conditions. We would expect the two groups of children to differ in terms of factors influencing the use of medical care and the resulting statistical interaction to mask the identity of those factors.

For example, the number of hospitalizations and visits to physicians increases with the number of disabilities. Because most children with chronic disorders have mild to moderate disability (from 12 to 17 percent have severe disability), they require much greater than average use of hospital and ambulatory care (12). In 1977, 36 percent of the total hospital days for all U.S. children under age 15 years (excluding newborns) resulted from chronic conditions (13). Such patterns of use not only generate disproportionately high medical costs, as compared with patterns for children

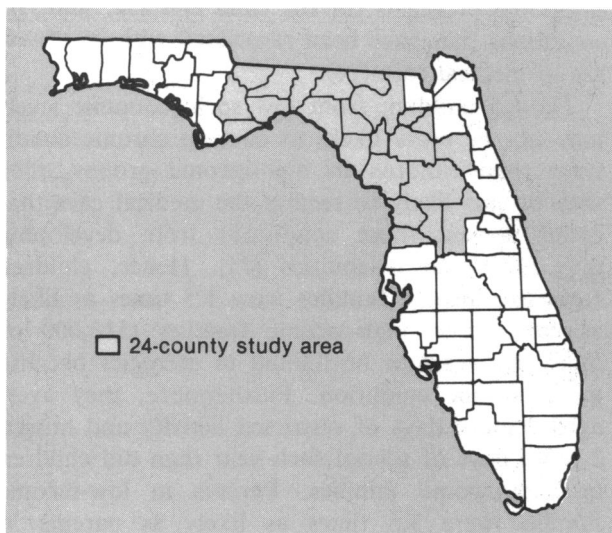
without chronic conditions, but also can result in emotional problems for the child and the family—conditions that have been associated with increased use of medical care (14).

Though children from low socioeconomic levels may not be more likely to develop chronic conditions than children in high-income groups, they may be less likely to receive the medical care that could prevent those conditions from developing into functional disabilities (15). Hence, children from low-income families were 1.5 times as likely as children in high-income families (\$15,000 or more per year) to be limited in activities because of a chronic condition. Furthermore, they averaged 3 more days of restricted activity and missed 2 more days of school each year than did children in high-income families. Parents in low-income families were 3.5 times as likely as parents in high-income families to perceive their children as being in fair or poor health, and such perceptions may reinforce the relationships between income, chronic illness, functional limitation, and use of medical care.

In our study, we analyzed the influence that several previously identified factors have on the use of health care in a population of chronically ill, Medicaid-eligible children who live in rural areas. Our expectations, based on earlier studies, were that this population would exceed the general pediatric population in the use of medical services. Confounding was expected to be markedly less in the analysis with respect to the possible statistical interaction of factors associated with the use of preventive care versus care for recurrent illness. Therefore, the study was expected to provide an enhanced opportunity to identify factors associated with the use of health care resources by a population that generates considerable interest because it consists of high consumers of medical care.

## Methods

The study population comprised 1,074 chronically ill children under 17 years of age residing in a 24-county rural area of northern Florida (map). The children were enrolled under the auspices of Children's Medical Services (CMS), Florida State Department of Health and Rehabilitative Services, and were also Medicaid-eligible during the period between July 1, 1980, and July 1, 1981. CMS eligibility in 1980 included children younger than age 21 who had a chronic, disabling, or potentially disabling medical condition (any condition that



hinders normal growth or development) and whose family could not afford to pay for all needed treatment (family of four earning wages less than \$9,000 gross per year). To have been eligible for Medicaid in Florida in 1980, a family must have met eligibility criteria for Aid to Families with Dependent Children (AFDC), Federal Supplemental Security Income (SSI), or family services foster care for children. During the study period, AFDC income eligibility in Florida was \$2,760 per year for a four-person family.

Because considerable differences existed in the availability of health resources (physicians, hospitals, and other allied medical services) among counties, a stratified random sample was selected to ensure equal proportions from each county. A sample of 672 children (32 percent of the total enrolled population) was obtained. Standardized questionnaires were administered in home interviews to obtain data on sociodemographic and health care use during the previous 12-month period. Hospitalization data for these children were obtained from a composite of the expenditure files of the Florida Medicaid program and CMS. Data on current primary chronic illness were obtained from individual chart reviews conducted by nurses employed by the project. These diagnoses were classified in 16 diagnostic categories based on groupings of codes of the International Classification of Diseases, ninth revision, clinical modification (ICD-9-CM) (16).

Univariate analyses used the *t* statistic for testing for differences in means for categorical data and correlations for continuous variables (17). Regres-

sion analyses were used to investigate multiple factors influencing the likelihood and magnitude of utilization (total physician visits, emergency room visits, and days of hospitalization). A stepwise logistic regression procedure was used when the dependent variable was the likelihood of use, while a stepwise multiple regression was used to identify the dependent variables predicting the magnitude of use.

Sociodemographic variables included in the analyses were the child's age, race, sex, family status (single- versus two-parent), years of education of the primary caretaker, the number of siblings, and county of residence.

Variables pertaining directly to the chronic illness were duration of illness, as expressed as a percentage of the child's life, and primary diagnosis, represented by the major ICD-9-CM categories.

The caretaker's perception of the child's health status was measured by three items:

- Expectations of the child's condition were measured by two variables, GETBETTER and STAYSAME. The reference category was "condition expected to get worse."
- Child's appearance compared with that of other children was measured by LOTDIF and LITTLEDIF. The reference category was "child does not look different."
- Ability of child to take part in physical activities was measured by ACTIVEALL—if the child "almost always" takes part—and ACTIVESOME—if the child "sometimes-somewhat" takes part. The reference category was child "never" takes part.

All six variables were available for entry into each of the six models. In addition, days of hospitalization were included as an independent variable in the health care visit and emergency room visit analyses.

## Results

**Characteristics of the study group.** Characteristics of the sample are presented in table 1. The age distribution of the study group was nearly one-third preschool and two-thirds school age. Of the children in the study group, 439 (65.4 percent) were from single-parent families, and 438 (67.2 percent) were black. The ratio of males to females was 1.3: 1. A high proportion (85.2 percent) of the children had primary caretakers who had at least 8 years of education, and 10 percent had caretakers

with schooling beyond high school. Approximately 46.4 percent of the children had one or two siblings, and almost a third (31.3 percent) of the population had three or more.

The caretaker's expectation concerning a child's illness was fairly positive: 60.5 percent of the caretakers interviewed expected that the child would get better and 32.0 percent expected no change. Nearly 70 percent responded that the child did not look different from other children, and 68.9 percent did not believe that the child had functional limitations which restricted physical activities.

Illness duration was expressed as a percentage of the child's lifespan. For instance, a 10-year-old child having a duration of 80 percent would be considered to have had the illness for 8 years. Table 1 shows that 75.9 percent of the study group had had their illness for at least 50 percent of their lifespan.

The distribution by diagnostic category is described in table 2. More than half the population was categorized as having a congenital anomaly (21.0 percent), a neurologic disorder (25.0 percent), or an ill-defined condition that could not be categorized elsewhere (12.5 percent).

**Visits to obtain health care.** The reported number of ambulatory visits to obtain health care during the period 1980-81 varied markedly, ranging from 0 to 158 visits; 90.6 percent of the children had had at least 1 visit and 19.2 percent had more than 10 visits. Overall, the mean number of visits was 7.8 (SD = 14.2) and the median was 4. For children with visits, the mean number was 8.6 (SD = 14.6) and the median was 4.

With the exception of three subgroups (infectious, endocrine, and digestive categories), the likelihood of a physician visit during the previous year varied in a tight range between 81 and 94 percent. Yet there was considerable variation in mean total number of visits classified by diagnostic group. The highest mean total visits were those of the neoplasms (17.7), mental disorder (15.1), and genitourinary (11.6) groups. That the mean numbers of visits for two of these groups are so much greater than the medians indicates that the majority of the children had relatively few visits, while relatively few children had a much larger number.

For those children with visits, age was inversely correlated ( $P = .002$ ) with the number of visits, and there was a positive correlation ( $P = .05$ ) with caretaker education level. A slightly higher, but not statistically significant, proportion of whites

Table 1. Sociodemographic characteristics of study population

Characteristic	Number of children	Percent
<b>Age:</b>		
0-4 years	208	31.1
5-10 years	277	41.4
11-16 years	184	27.5
Unknown	3	...
<b>Race</b>		
Black	438	67.2
White	209	32.1
Other	5	0.7
Unknown	20	...
<b>Sex:</b>		
Female	282	43.3
Male	370	56.7
Unknown	20	...
<b>Family status:</b>		
Single parent	439	65.4
Two parent	232	34.6
Unknown	1	...
<b>Education of primary caretaker:</b>		
Less than 8 years	97	14.8
8-12 years	491	75.2
More than 12 years	65	10.0
Unknown	19	...
<b>Number of siblings:</b>		
0	150	22.3
1-2	312	46.4
3-5	190	28.3
More than 5	20	3.0
<b>Expectation of child's illness:</b>		
Get better	365	60.5
Stay the same	193	32.0
Get worse	45	7.5
Unknown	69	...
<b>Child's appearance compared with other children's:</b>		
Looks a lot different	54	8.1
Looks a little different	152	22.7
Does not look different	463	69.2
Unknown	3	...
<b>Ability to take part in physical activities:</b>		
Almost always able	461	68.9
Sometimes/somewhat able	142	21.2
Never able	66	9.9
Unknown	3	...
<b>Duration of illness:</b>		
0-29 percent of lifespan	104	16.5
30-49 percent of lifespan	48	7.6
50-79 percent of lifespan	110	17.5
80-100 percent of lifespan	368	58.4
<b>Total</b>	<b>672</b>	<b>100.0</b>

(93.8 percent) than of blacks (89.0 percent) made visits. However, whites made significantly more visits ( $P = .0001$ ). Children who looked a lot or a little different from other children made significantly more visits than children who did not look different ( $P = .0001$  and  $P = .009$ , respectively). Finally, children who were almost always able to

Table 2. Diagnostic groups of study children with visits for health care, 1980-81

Diagnosis	Number of children	Percent with visits	For those with visits			
			Mean	SD	Median	Range
Infectious diseases ...	3	66.7	3.5	.7	3.5	3-4
Neoplasms .....	13	84.6	17.7	13.6	14.0	1-39
Endocrine, nutritional, and metabolic diseases and immunity disorders ..	10	100.0	5.4	4.9	3.0	1-14
Diseases of blood and blood-forming organs	17	94.1	7.9	7.4	5.5	1-26
Mental disorders .....	35	94.3	15.1	26.9	5.0	1-111
Diseases of the nervous system and sense organs .....	168	91.7	6.6	10.7	4.0	1-101
Diseases of the circulatory system ...	18	88.9	5.6	6.5	2.5	1-21
Diseases of the respiratory system...	31	87.1	10.7	14.8	7.0	1-77
Diseases of the digestive system ....	19	73.7	7.8	5.2	6.0	1-15
Diseases of the genitourinary system.	23	91.3	11.6	32.1	4.0	1-151
Diseases of the skin and subcutaneous tissue .....	11	81.8	5.4	3.7	4.0	2-15
Diseases of the musculoskeletal system and connective tissue ...	55	94.6	7.1	8.3	5.0	1-49
Congenital anomalies .	141	92.9	9.7	12.8	5.0	1-80
Certain conditions originating in the perinatal period .....	16	93.8	8.2	8.4	4.0	1-28
Symptoms, signs, and ill-defined conditions .	84	88.1	9.4	19.8	4.0	1-158
Injury and poisoning ..	12	91.7	4.9	5.0	2.0	1-16
None .....	16	81.3	4.5	3.2	3.0	1-12
Overall sample .....	672	90.6	8.6	14.6	4	1-158

NOTE: SD = standard deviation.

Table 3. Summary of regression analysis for health care visits among children in the study group

Variable	Likelihood of a visit $\beta$	P value	Total visits of children with 1 or more visits $\beta$	P value
Intercept. ....	1.38	...	9.25	...
Infectious diseases .	-2.87	<.05	...	...
Mental disorders ...	...	...	7.59	<.01
Diseases of the digestive system ..	-1.63	<.05	...	...
Age .....	...	...	-.47	<.01
Sex (male = 1) ....	.65	<.05	...	...
Race (black = 1)...	...	...	-4.99	<.01
Education .....	.13	<.01	...	...
Getbetter (yes = 1).	-.90	<.01	3.09	<.05
Lotdif (yes = 1) ...	-1.43	<.01	6.50	<.01
Activesome (yes = 1) .....	1.30	<.05	6.75	<.01
Hospital days .....	...	...	.56	<.01
Number of children .	1558	...	1506	...
			$R^2 = .1869$	

<sup>1</sup>Observations deleted due to missing values are 114 and 103, respectively.  
NOTE: Overall P values for both the likelihood of a visit and the number of visits among children with 1 or more visits:  $P < .0001$ .

*'At least 50 percent of the children with illnesses diagnosed in the respiratory or perinatal subgroups had visited an emergency room during the previous year.'*

participate in physical activities made fewer visits than those sometimes able ( $P = .0001$ ) and those never able ( $P = .0003$ ).

The results of the regression procedures for likelihood of a visit and the total number of visits are presented in table 3. These results indicate that male children and children whose caretakers were better educated were more likely to have had at least one visit. Children diagnosed with infectious or digestive disorders, who look a lot different from other children, or are expected to get better, or are sometimes active were less likely to have made a visit.

If there was at least one visit, the number of visits was likely to be higher among children with a chronic illness diagnosed as a mental disorder. A

child who is expected to get better, who can take part in physical activities some of the time, whose appearance is a lot different from that of other children, and who has been hospitalized during the previous year is predicted to have made more visits for medical care. The predicted number of visits is less for a black child and for an older child. Caretaker education level, although significant in predicting the likelihood of a visit, failed to achieve significance in predicting the number of visits when these other factors were included in the analysis.

**Emergency room visits.** Of the children in the study group, 238 (35.4 percent) had made visits to the emergency room during the previous year, with

Table 4. Diagnostic groups of study children with emergency room visits, 1980-81

Diagnosis	Number of children	Percent with visits	For those with visits			
			Mean	SD	Median	Range
Infectious diseases ...	3	33.3	1.0	...	...	...
Neoplasms .....	13	30.8	3.0	2.7	2.0	1-7
Endocrine, nutritional, and metabolic diseases and immunity disorders ..	10	10.0	1.0	...	...	...
Diseases of blood and blood-forming organs	17	47.1	4.9	3.1	5.0	1-11
Mental disorders .....	35	42.9	3.1	2.9	1.0	1-12
Diseases of the nervous system and sense organs .....	168	30.9	2.4	2.5	2.0	1-13
Diseases of the circulatory system ...	18	16.7	2.0	1.7	1.0	1-4
Diseases of the respiratory system ...	31	51.6	3.1	3.5	2.0	1-14
Diseases of the digestive system .....	19	42.1	2.9	1.6	3.0	1-5
Diseases of the genitourinary system.	23	47.8	1.8	1.4	1.0	1-5
Diseases of the skin and subcutaneous tissue .....	11	36.4	1.5	0.6	1.5	1-2
Diseases of the musculoskeletal system and connective tissue....	55	36.4	1.5	0.9	1.0	1-4
Congenital anomalies.	141	36.9	2.7	2.7	1.5	1-15
Certain conditions originating in the perinatal period .....	16	50.0	3.8	4.2	2.0	1-13
Symptoms, signs, and ill-defined conditions.	84	29.8	1.6	0.7	1.0	1-3
Injury and poisoning ..	12	33.3	1.3	0.5	1.0	1-2
None.....	16	37.5	1.7	1.0	1.0	1-3
Overall sample .....	672	35.4	2.4	2.5	1.5	1-15

NOTE: SD = standard deviation.

a mean of 2.4 (SD = 2.5) and a range of 1-15 visits. Significant variation in emergency room visits by diagnostic group (table 4) is apparent. At least 50 percent of the children with illnesses diagnosed in the respiratory or perinatal subgroups had visited an emergency room during the previous year. The highest mean numbers of emergency room visits were by children in the blood disorder (4.9) and perinatal (3.8) subgroups (the medians were also higher than average). The proportion of children who made at least one emergency room visit varied little according to the individual factors analyzed. The only univariate relationship that was statistically significant was an inverse correlation with age ( $P = .02$ ). In the regression analyses (table 5), respiratory illness, activity limitations, and increased hospital days contributed signifi-

Table 5. Summary of regression analysis for emergency room visits among study children

Variable	Likelihood of a visit $\beta$	P value	Total visits of children with 1 or more visits $\beta$	P value
Intercept.....	-.02	...	2.74	...
Diseases of blood and blood-forming organs .....	...	...	2.78	<.01
Diseases of respiratory system.	.90	<.01	...	...
Age .....	-.06	<.01	-.10	<.01
Activeall (yes = 1) .	-.48	<.01	...	...
Hospital days .....	.058	<.01	...	...
Number of children .....	.558	...	1199	...
			$R^2 = .1400$	

<sup>1</sup>Observations deleted due to missing values are 114 and 39, respectively. NOTE: Overall P values are these:  $P < .0001$  for likelihood of a visit and  $P < .22$  for visits among children with 1 or more visits.

Table 6. Distribution of number of days of hospitalization among 672 study children, 1980-81

Days	Number of children	Percent
0 .....	582	86.6
1-2 .....	30	4.5
3-5 .....	22	3.3
6-10 .....	19	2.8
11-20 .....	13	1.9
21-30 .....	4	0.6
31-50 .....	2	0.3

cantly to the likelihood of an emergency room visit. The significance of age was retained in both the likelihood of making a visit and the total number of visits, although the regression model for the total number of visits itself was not significant.

**Hospitalization.** Approximately 13 percent of the study group had been hospitalized during the previous year, with 2.8 percent hospitalized for longer than 10 days (table 6). The mean number of total days of hospitalization for the entire study group was 0.96 (SD = 3.83). For hospitalized children, the mean number of days was 7.2 (SD = 8.1), the median was 4.5, and the average stay was 4.8 days. The total number of hospitalizations was

Table 7. Diagnostic groups of study children by number of days of hospitalization, 1980-81

Diagnosis	Number of children	Percent hospitalized	Days of hospitalization for those with hospitalization			
			Mean	SD	Median	Range
Infectious diseases . . .	3	0.0	...	...	...	...
Neoplasms . . . . .	13	15.4	7.5	0.7	7.5	7-8
Endocrine, nutritional, and metabolic diseases and immunity disorders . .	10	10.0	11.0	...	11.0	...
Diseases of blood and blood-forming organs	17	11.8	6.5	2.1	6.5	5-8
Mental disorders . . . .	35	8.6	10.0	15.6	1.0	1-28
Diseases of the nervous system and sense organs . . . . .	168	11.3	9.7	12.7	5.0	1-45
Diseases of the circulatory system . .	18	11.1	9.5	10.6	9.5	2-17
Diseases of the respiratory system . .	31	12.9	7.5	4.5	7.5	2-13
Diseases of the digestive system . . .	19	21.1	4.3	3.9	2.5	2-10
Diseases of the genitourinary system .	23	8.7	9.0	8.5	9.0	3-15
Diseases of the skin and subcutaneous tissue . . . . .	11	36.3	4.0	3.6	3.0	1-9
Diseases of the musculoskeletal system and connective tissue . . .	55	9.1	6.2	4.0	5.0	3-13
Congenital anomalies .	141	21.3	5.6	5.7	3.5	1-28
Certain conditions originating in the perinatal period . . . .	16	6.7	30.0	...	30.0	...
Symptoms, signs, and ill-defined conditions .	84	9.5	5.9	5.2	4.5	1-16
Injury and poisoning . .	12	9.1	1.0	...	1.0	...
None . . . . .	16	12.5	7.5	6.4	7.5	3-12
Overall sample . . . . .	672	13.4	7.2	8.1	4.5	1-45

NOTE: SD = standard deviation.

135, yielding an average of .20 hospitalizations per person in the study group.

There was considerable variation in hospital days both within and among diagnostic categories (table 7). Among those whose illnesses were diagnosed in the skin, congenital, or digestive subgroups, a relatively high percentage had been hospitalized—36.3, 21.3, and 21.1 percent, respectively. Of the remaining diagnostic groups, 0-15.4 percent had been hospitalized. The circulatory, respiratory, and genitourinary subgroups had relatively high mean numbers and median numbers of hospital days (7.5 or greater).

The children most likely to have been hospitalized during the study period were those under 5 years of age (21.1 percent hospitalized) and those

Table 8. Summary of regression analysis for hospitalization among study children

Variable	Likelihood of hospitalization $\beta$	P value	Total hospital days $\beta$	P value
Intercept . . . . .	-1.39		9.27	
Diseases of the skin and subcutaneous tissue . . . .	1.63	<.05	...	
Congenital anomalies . . . .	.63	<.05	...	
Certain conditions originating with perinatal period . . . . .	...	...	26.08	<.01
Age . . . . .	-.11	<.01	...	...
Activeall (yes = 1) . . . . .	...	...	-6.27	<.01
Number of children	1558		173	
			$R^2 = .3801$	

<sup>1</sup>Observations deleted due to missing values were 114 and 17, respectively.  
NOTE: Overall P values are these: P < .0001 for likelihood of a visit and P < .06 for number of hospital days among hospitalized children.

who were never able to participate in physical activities (25.8 percent hospitalized).

Children whose appearance was a little different had a significantly higher ( $P < .003$ ) mean number of days in the hospital (10.6) than children whose appearance was not different from that of other children (5.4). The mean number of hospital days was also higher ( $P < .002$ ) for children unable to participate in physical activities (12.2) than for those sometimes able to participate (5.4).

Regression results for the likelihood of hospitalization and the total number of days of hospitalization are presented in table 8. Children diagnosed with skin or congenital disorders were more likely to have been hospitalized; older children, less likely. Children with a perinatal illness are predicted to have more days of hospitalization (this prediction results because of one child in this category who was hospitalized for 30 days), and children who almost always take part in physical activities are predicted to have fewer days of hospitalization.

## Discussion

The use of health care by the study population is comparable to that found by the 1981 National Health Interview Survey (unpublished data from the National Center for Health Statistics) for the U.S. population of children under 17 years of age with chronic conditions. The average number of physician visits was 7.8 for our study group,

nearly midway between the average of 3.9 and 9.5 visits for children without and with activity limitations. Furthermore, activity limitations were associated with significantly more physician visits. Similarly, the average length of hospital stay was comparable to the National Health Interview Survey's finding of an average 5.4 days for the total under 17 years of age, and the multivariate analysis confirmed that children with activity limitations have significantly more days of hospitalization. Hence, it would seem that activity limitations play a role in health care use among the population as a whole and among the low-income population surveyed for this study.

An interesting finding of this study is the wide variation in the use of health care both within and among disease categories. For instance, the number of ambulatory visits for children with illnesses diagnosed in the mental, nervous, genitourinary, or ill-defined subgroups ranged from 1 to more than 100 for those children with at least 1 visit. With the exception of the neoplasms subgroup, the diagnostic subgroup medians varied in a relatively narrow range from 2.0 to 7.0, and the means ranged from 3.5 to 15.1. Similar use distributions were noted for hospitalizations. These findings are consistent with those of other investigators (18-20) who have reported that mean health care expenditures were considerably higher than median expenditures in populations of chronically ill children, and that there was wide variation in health care expenditures both within and among disease categories.

The significance or lack of significance of certain of the disease categories in the regression analysis may reflect the fact that relatively few children had increased health care use. Hence, generalizations to other populations should be made cautiously. Younger children had increased use of ambulatory services and were more likely to have been hospitalized. Black children had a lower number of physician visits among children with at least one visit but were not significantly different from white children in the other modeled utilization variables. Associations with caretakers' education levels were significant in the likelihood of making a physician visit but not in any other measure of utilization. Neither family size (as indicated by the number of siblings) nor family status nor duration of illness was associated with significantly different use levels.

While these results confirm the influence of certain variables on the use of pediatric health care, they also point to a continued inability to

explain the variation in use among a relatively homogeneous population of low-income, rural children with chronic diseases. The amount of variation explained by the models used in this analysis ranged from 14 to 38 percent—data that compare favorably with those from other studies but that are by no means definitive. Certainly the homogeneity of the population with respect to expected high levels of use and the inclusion of primary diagnosis have helped. Yet the generally low predictive power of any of these models limits their use in identifying a population for targeted intervention. Finally, the general finding that only a relatively few children had a very much higher level of health care use (means were invariably larger than medians) suggests that targeted interventions to reduce use in this small, but elusive, group of children might yield considerable cost savings.

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## Smoking Behavior among Student Nurses: a Survey

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### Synopsis.....

*The study describes the smoking habits of student nurses and determines the correlates of smoking initiation, continuation, and cessation. The sample included 1,163 students attending 10 nursing schools in Buffalo, NY. Data were gathered by means of a self-administered questionnaire.*

*Approximately 30 percent of the students were current smokers, 25 percent were exsmokers, and 45 percent had never smoked. More than half of the smokers (57 percent) expressed the desire to quit, and 81 percent had tried to do so in the past. Major reasons for trying to quit were to protect future health, save money, self-discipline, and pressure from significant others. Most (90 percent) of the students who had tried to quit had attempted to do so on their own and all at once. Knowledge of the health consequences of smoking was not significantly related to smoking behavior.*

*These data suggest the need for health educators to promote personal health practices among their students that are congruent with the goals of the nursing profession of health promotion and disease prevention.*

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**B**ECAUSE NURSES ARE THE LARGEST occupational group among health professionals, they are a potentially powerful resource for influencing the smoking patterns of Americans. They are viewed as exemplars to others and as credible resources

for information about smoking (1-3). However, studies indicate that nurses smoke more than other health professionals and have both disturbingly high smoking rates and low rates of cessation (2, 4-12).