The Content of Adult Primary Care Episodes

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OUR KNOWLEDGE OF THE CONTENT OF PRIMARY CARE has been limited by shortcomings in the available data and by a research focus on inpatient services (1,2). Yet primary care represents one of the most critical components of the health care delivery system (3). It serves as the point of a person's first contact with the medical care system and involves a continued responsibility for a patient's care, both over time and across a wide range of services (4-7). (This description incorporates the various commonly cited elements of primary care—for example, continuity, comprehensiveness, and coordination—although it is not a formal definition of the term. Fein presents a justification for such an approach (8).) If the features of primary care incorporated in this description are the criteria, in the course of any given year, a far higher proportion of the population will use primary care services than other kinds of medical services. For example, in 1977, 75 percent of the U.S. population made at least one visit to a physician, whereas only 10 percent were hospitalized (9).

From the classic Clute (10) and Peterson (11) studies to several more recent efforts (12–15), research on the content of primary care has tended to focus on the primary care provider and on analyses of the provider's care orientation or of unrelated visits made to a provider in a defined period. An exception is the National Household Interview Survey component of the National Health Survey (16). Nevertheless, from the patient's perspective, care is not received in response to a visit but in response to a specific complaint leading to a visit or a series of linked visits. Recognition of this fact has led to a call for analyses of the treatment rendered in responding to episodes of illness (17). Unfortunately, empirical research on episodes of care has been up to now limited, in part because of the lack of data for this form of analysis.

The prepaid group practice form of organization presents an opportunity to obtain the kind of data required for episode-specific forms of analyses. Because comprehensive care is provided to an enrolled population in return for a fixed and predetermined fee (18), patients in such a practice are more likely to use a single source of care for all related treatment than are patients served by other care systems. The availability of a centralized medical record, appropriately accessed for research purposes, affords a rich source of data that can be used to analyze episodes of illness and to evaluate the content of primary care.

In this paper, prepaid group practice data from the Health Services Research Center, Kaiser-Permanente Medical Care Program—Oregon Region (K-P),

are used to describe the content of adult primary care. The focus is on episodes of illness for six common primary care conditions that reflect a range of adult care needs—acute, chronic, symptomatic, and preventive. For each condition, four dimensions of each episode of care are discussed: (a) the patient's characteristics, (b) mode of presentation of episode, (c) episode's duration, and (d) content of the care provided.

Study Site and Design

Study site. The study site was the Kaiser-Permanente Medical Care Program—Oregon Region. The characteristics of this large established prepaid group practice have been described extensively elsewhere (19). During the 2-year study period July 1969 through June 1971, the system provided for the medical care needs of approximately 140,000 people in the Portland metropolitan area, or about 15 percent of the Portland Standard Metropolitan Statistical Area population. The K-P membership includes a number of diverse groups representing various social and economic classes. In 1970, about 84 percent of the membership had been enrolled through groups, 7 percent were more than 65 years of age, and 4 percent had been enrolled under a grant to integrate the medically underserved into the K-P delivery system (20).

K-P offers prepaid full-service benefits within the context of a group practice of medicine. Comprehensive medical services are provided mainly by board-eligible or board-certified physicians practicing full time in modern clinics providing outpatient services and having complete hospital services available. During the study period, primary care was provided at Bess Kaiser Hospital, a 250-bed acute-care facility, and at 5 outlying satellite clinics dispersed throughout the Portland metropolitan area.

Data sources. Our analysis was based upon information from various data bases and sources maintained by the Health Services Research Center at K-P. The primary data source was the "Outpatient Medical Care Utilization Study," which is based on a 5 percent random sample of currently enrolled subscriber units. In this ongoing study, detailed data on all outpatient medical utilitization by the study sample are abstracted from the medical record following any contact with the K-P system. Most clinical services are coded in aggregate terms according to the type of contact (for example, initial office visit or telephone call to receive a prescription). Laboratory and radiology procedures are coded in-

dividually. The data system is structured to link each procedure recorded to the specific diagnosis for which it was rendered. By definition, primary clinical service codes (the aggregate service codes just referred to) are assigned to the diagnosis for the presenting complaint. Related care of any type across contacts is linked through the use of episode codes. During the study period, the use of pharmaceuticals was not recorded.

Focus on internal medicine. Internists are the major providers of adult primary care at K-P. Thirty-six of them, all either board-certified in internal medicine (64 percent) or eligible for certification (36 percent), practiced primary care at K-P for at least some portion of the 2-year study period. All served as general primary care practitioners, although 47 percent had a subspecialty. The subspecialties included cardiology (3 internists); endocrinology, rheumatology, allergy, gastroenterology, and chest diseases (2 internists each); and hematology, nephrology, neurology, and oncology (1 internist each). The average internist was 41 years old as of July 1970; 58 percent of the internists were between 35 and 44 years old. On the average, the internists had finished medical school 15 years before and training 9 years before. On the average, also, they had been with the plan for 5.4 years; 10 had joined the plan less than a year before, and 8 had been affiliated with it for 10 years or more.

Definition of episodes. To control for case mix, we selected six primary care conditions for independent analysis. The aim in the selection was to encompass a range of the acute, chronic, symptomatic, and preventive care needs of adults with an emphasis on those conditions occurring most frequently. The six conditions selected—upper respiratory infection (URI), urinary tract infection (UTI), hypertension (HYP), abdominal pain (AP), chest pain (CP), and physical examination (PE)—accounted for 31 percent of visits to internists' offices at K-P. (Preventive care needs are not strictly speaking "conditions." However, for simplicity, we refer to physical examinations as one of the six "conditions" studied.)

Formulating an operational definition of an episode of care was one of the most difficult problems in the project; the final specifications we used were detailed and complex (21). In general, we have defined an episode of care as including all the services related to that episode which had been provided during the study period. All episodes of the 6 conditions occurring in the 5 percent sample that met

the selection criteria were included in our analysis. Except for hypertension, episodes were selected if they had begun during the study period with a clinic visit to an internist for the selected condition. Because hypertension was considered an ongoing chronic condition, all episodes of it for which any treatment had been provided during the study period were selected. Once identified, the care related to the episode, except care provided for PE episodes (which involved only a single contact), was tracked until the episode's end or until the end of the study period, whichever came first. Care provided by anyone other than an internist was not included in the analysis. (The project data indicated that little of the care provided for the episodes—only 9 percent of non-PE episodes and 2 percent of all episodes—was given by anyone other than an internist.) Episodes of symptomatic conditions, that is, AP and CP, were tracked only until the physican made a definitive diagnosis of disease. Thus, our analysis focused on the kind and amount of resources used in diagnosing symptomatic conditions.

By the nature of disease, care episodes may include

Table 1. Distribution of episodes of care by disease condition

Disease condition	Number	Percent
Upper respiratory infection ((URI)	671	16.8
Urinary tract infection (UTI)	185	4.6
Hypertension (HYP)	376	9.4
Abdominal pain (AP)	184	4.6
Chest pain (CP)	111	2.8
Physical examination (PE)	2,473	61.8
Total	4,000	100.0

treatment for multiple related diagnoses. Therefore, the episode codes in the data base were designed so as to link care across shifts in diagnoses or across multiple related diagnoses. To ensure that episodes reflected the selected conditions, all the contacts that constituted each episode, along with the selected variables for each—particularly the diagnosis—were listed. A review of this listing indicated that based on the "International Classification of Diseases, Adapted" codes, most episodes appeared to reflect treatment for the conditions cited. A partial excep-

Table 2. Distribution of episodes of care for the six disease conditions by selected patient socioeconomic and other variables

Patient variables	URI	UTI	HYP	AP	CP	PE
Sex:						
Percent female	62.4	91.9	58.2	63.6	46.8	60.7
Episode base	671	185	376	184	111	2,473
Age:						
Mean years	37.0	37.3	55.7	44.5	47.0	45.6
Percent 65 or older	6.6	6.5	30.9	18.5	16.2	15.9
Episode base	670	185	376	184	111	2,473
Family income:[1]						
Mean annual[2]	$8,475	$9,275	$6,820	$7,390	$8,425	$7,800
Percent with $5,000 or less	9.8	9.4	27.0	19.5	11.8	15.5
Episode base	400	117	270	118	68	1,642
Education:[1]						
Mean years[2]	12.2	11.1	11.3	11.7	11.6	12.1
Episode base	355	109	272	114	66	1,575
Race:[1]						
Nonwhite	6.9	5.0	3.6	5.8	2.9	3.7
Episode base	406	119	276	120	69	1,669
Health status as perceived by patient:[1]						
Mean (1=excellent, 4=poor)	1.96	1.88	2.25	2.19	2.11	1.88
Percent fair or poor	19.0	22.9	34.9	34.5	28.1	19.1
Episode base	353	109	269	113	64	1,563
Length of membership in plan:						
Mean months since joining	59.8	65.3	82.4	66.8	66.2	75.2
Percent who joined less than 12 months ago	16.2	15.1	16.0	15.8	15.3	16.1
Episode base	671	185	376	184	111	2,473

[1] Based on self-reported information from the Kaiser Household Interview Survey involving the entire 5 percent sample of subscriber units that were enrolled for the full 2-year period 1969–70.

[2] Calculated from grouped data by interpolation.
NOTE: For explanation of acronyms, see table 1.

tion was URI, which by its nature occurs in association with many other diagnoses. The small number of episodes that appeared to reflect conditions other than the six we selected were eliminated from the final analysis. Table 1 displays the final number of episodes analyzed.

To minimize arbitrary judgment, rules were formulated for determining when an episode would be eliminated for each condition. These rules resulted in the elimination of 10 URI, 10 UTI, 30 HYP, 5 AP, and 7 CP episodes. Decisions to eliminate episodes were most common for UTI and HYP episodes. In several UTI episodes involving a considerable amount of care, the UTI diagnosis appeared secondary to a more serious chronic condition (for example, cancer, calculus of the prostate, benign neoplasm of the bladder, or pyelonephritis). There were several HYP episodes of long duration in which by the start of the study period, the hypertension seemed to be secondary to other diseases of the circulatory system (especially arteriosclerotic heart disease). The criteria that we established resulted in the removal of some extreme cases. Particularly for UTI and HYP episodes, these criteria probably also resulted in a mix of less severe cases, although one that also probably better reflects the uncomplicated primary care condition.

Results

Patients' characteristics. Data on the characteristics of the patients treated for each type of episode are presented in table 2. In general, these patients were

Table 3. Percentage distribution of project sample and of total Kaiser-Permanente (K-P) Health Plan membership by selected socioeconomic variables

Socioeconomic variables	Project sample (across all 6 conditions)	Total K-P Health Plan membership [1]
65 years of age or older	15	[2]11
Female	62	[2]53
High school graduate	69	[3]68
Annual family income $5,000 or less	16	[4]18
Head of household nonwhite	4	[4]4
Perceived health status fair or poor	19	[4]22

[1] SOURCES: "Some Informative Descriptive of a Successfully Operating HMO" by E. Saward, J. Blank, and H. Lamb, DHEW Publication No. (HSM) 73–13011, Department of Health, Education, and Welfare, 1973, and data from the 1970–71 Household Interview Survey, Research Report Series No. 1, Health Services Research Center, Kaiser Foundation Hospitals, 1976.
[2] Members 20 years and older as of December 1971.
[3] Respondents in K-P household interview survey.
[4] Families in K-P household interview survey.

similar in income, education, and race to the adult population of K-P (table 3). The episodes selected for analysis did involve a larger proportion of elderly and female patients, as well as a small proportion of patients who perceived their health status as poor or fair. Our results, however, reflect the distinctive characteristics of the patients treated for each type of condition. As shown in table 2, patients with hypertension were the oldest and the ones most likely perceive their health as poor or bad; those with acute conditions (that is, URI and UTI) were likely to display these characteristics. In addition to UTI (which tends to occur in females), a disproportionate number of each type of episode except CP involved female patients.

Mode of presentation of episode. The manner in which an episode is presented for initial treatment gives some indication of its nature. Some conditions produce symptoms that lead the patient to seek care and thus may be defined as "presenting diagnoses;" other conditions may be, relatively speaking, asymptomatic, and the patient receives treatment for them in the course of care directed at other conditions or at other presenting complaints. Similarly, some conditions require treatment that can be anticipated and scheduled easily; others are more likely to be unanticipated and to cause the patient to "walk in" for care instead of scheduling an appointment in the future.

Table 4 presents data on how at their outset the episodes differed in respect to both these variables, that is, in respect to the first doctor office visit (DOV) in the episode. Although variability existed on both measures, variation across the six conditions tended to be greater than within each condition. The acute conditions URI and UTI were likely to be presenting diagnoses for the first DOV in the episode, and the patient was likely to walk in for care. In contrast, a chronic HYP condition usually was not the presenting diagnosis at the first DOV, and it rarely was treated on a walk-in basis. Symptomatic conditions—AP and CP—showed the largest variation internally and fell between these two extremes. As a result of the criteria used in episode selection, physical examination episodes all were considered to be presenting diagnoses at the first DOVs; few of them were taken care of on a walk-in basis. Conditions cared for by appointment were more likely to be treated by a regular attending physician, whereas those that led to walk-in care were more likely to be treated by a temporary attending physician. Since regular attending physi-

Table 4. Distribution of episodes of care for six disease conditions by selected measures of their mode of presentation at first doctor office visit in episode

	URI	UTI	HYP	AP	CP	PE
Total episodes	671	185	376	184	111	2,473
Condition was presenting diagnosis at 1st doctor office visit:						
Number of episodes	593	143	123	100	74	2,473
Percent of episodes	88.4	77.3	26.6	66.8	66.7	100
Patient walked in with no appointment at first doctor office visit:						
Number of episodes	585	135	50	91	69	17
Percent of episodes	87.2	73.0	13.3	49.5	62.2	.7
Percent of episodes for which care on 1st doctor office visit was provided by:						
Regular attending physician	31.1	44.9	90.2	62.0	54.1	98.7
Temporary attending physician	68.9	55.1	8.0	38.0	45.9	1.1
Consultant	.0	.0	1.9	.0	.0	.2

NOTE: For explanation of acronyms, see table 1.

Table 5. Distribution of episodes of care for six disease conditions by selected measures of duration of that care

Measures of duration and care provider	URI	UTI	HYP	AP	CP
Total episodes	671	185	376	184	111
Extended beyond 1st doctor office visit for internist care:					
Number of episodes	153	92	273	60	25
Percent of episodes	23	50	73	33	23
Duration in days from start of last internist contact of any type:					
Mean	5.8	20.7	236.2	11.0	9.0
Minimum-maximum	0–715	0–329	0–722	0–243	0–213
Standard deviation	38.6	53.0	239.8	34.8	33.0
Internist contacts in episode:					
Mean	1.4	2.0	4.2	1.5	1.3
Minimum-maximum	1–10	1–9	1–30	1–8	1–3
Standard deviation	.9	1.4	3.9	1.1	.6
Treated entirely by physician of first doctor office visit:					
Number of episodes	596	163	292	170	104
Percent of episodes	89	88	78	92	94

NOTE: For explanation of acronyms, see table 1.

cians are likely to have more knowledge of a patient than temporary attending physicians, the type of condition, mode of patient's presentation for treatment, and the pattern of care received all appear to be related.

Duration of episode. Table 5 presents data on selected measures of episode duration for each condition except physical examinations, to which the measures do not apply. Hypertensive care episodes were most likely to extend beyond the first DOV (73 percent of the episodes), followed by UTI (50 percent), AP (35 percent), and URI (23 percent). Although substantial variation was found, measures of duration based on calendar days and total internist contacts followed similar patterns. The chronic

condition HYP, on the average, was likely to have been treated for a substantial part of the study period (236 days) and to have involved a larger number of internist contacts (4.2 on the average) than the other conditions. Treatment for the remaining four conditions was relatively short. In comparison with the other acute and symptomatic conditions, UTI episodes lasted somewhat longer (an average of 21 days) and involved a slightly greater number of contacts (an average of 2).

Ignoring the single-contact PE episodes, we find that a large proportion of episodes (87 percent) were treated entirely by the internist whom the patient saw on the first DOV. Treatment by multiple providers was most likely for HYP episodes, as might be expected given their longer duration and, there-

Table 6. Distribution of episodes of care for six disease conditions by existence of a related co-morbidity at outset (at first doctor office visit) or at any point in episode

Existence of a related co-morbidity	URI	UTI	HYP	AP	CP
At any point in episode:					
Number of episodes	155	3	43	11	2
Percent of episodes	23.1	1.6	11.4	6.0	1.8
At first doctor office visit:					
Number of episodes	111	2	26	8	2
Percent of episodes	16.5	1.1	6.9	4.3	1.8

NOTE: For explanation of acronyms, see table 1.

Table 7. Distribution of episodes of care for six disease conditions by selected measures of intensity of that care

Measures of intensity of care	URI	UTI	HYP	AP	CP	PE
CRVS units of care provided (total Kaiser conversion factor):						
Mean	5.4	7.3	7.3	9.3	6.5	12.8
Minimum-maximum	0–31	0–46	0–93	0–46	0–27	8–27
Standard deviation	3.4	6.1	11.0	8.6	5.3	2.7
Percentage contribution to overall care:						
Clinical services	88	65	62	37	50	59
Laboratory services	6	29	23	9	23	21
Radiology services	7	7	15	55	28	20
1 or more laboratory tests:						
Number of episodes	165	165	149	59	49	2,308
Percent of episodes	25	89	40	32	44	93
Mean CRVS units per episode	1.2	2.4	4.2	2.6	3.3	2.9
Mean tests per episode	1.1	3.0	3.6	3.1	1.6	4.6
1 or more radiology tests:						
Number of episodes	57	6	38	74	40	1,677
Percent of episodes	9	3	10	40	36	68
Mean CRVS units per episode	2.7	8.3	5.8	6.9	2.7	2.1
	1.2	1.2	1.2	1.5	1.1	1.0
Number of episodes involving 1 or more hospitalizations	1	0	7	4	1	0
Number of episodes involving referral to consultant at end of initial doctor office visit in episode	3	7	1	10	0	2

NOTE: CRVS=California Relative Value Schedule (see text).

fore, the greater opportunity for use of multiple providers. The fact that 78 percent of the HYP episodes continued to be treated by the first DOV physician may suggest that continuity of care is affected by the disease-specific needs for followup care which lead to a physician's or patient's preferring to maintain contact with the same person.

Diseases treated concurrently with the episode condition may affect the care provided. For each condition, therefore, we listed a set of diagnoses to define other conditions that could be considered related; all diagnoses treated during contacts involving care relevant to the episode were then reviewed to ascertain whether any of the diagnoses matched the related co-morbidities on the episode-specific list. The co-morbidities were selected based on their med-

ical relationship to the episode condition. The following diagnoses were thus defined for the five conditions: URI—sinusitis, bronchitis, otitis media, laryngitis, and pneumonia; UTI—prostitis, pyelonephritis, urinary tract obstruction; HYP—peripheral vascular disease, atherosclerotic and other cardiovascular disease, stroke, and renal disease or failure; AP—renal disease, liver disease, gastrointestinal disease, diabetes, and pelvic inflammatory disease; and CP—arteriosclerotic heart disease, gastrointestinal disease, and respiratory disease as defined by URI along with its related co-morbidities. Table 6 displays the frequency distribution for the related co-morbidity variables by condition. As would be expected given the episode selection criteria, few episodes involved a concurrent related co-morbidity.

When related co-morbidites occurred, they tended to exist at the start of the episode and were likely to occur in conjunction with URI episodes (23 percent) and HYP episodes (11 percent).

Content of care. Table 7 presents a summary of the overall level and kinds of care provided in treating each episode. Because data on the costs of individual services were not available, the overall level of care provided (that is, the intensity of care) was measured by using the California Relative Value Schedule (CRVS) to approximate the individual service costs for clinical, laboratory, and radiology services (22). By placing weights on individual services to reflect or estimate the cost of the resources used in each service, we were able to obtain a better measure of resource use than we would have obtained by simply counting the services used (23). Since CRVS values for each type of service are derived independently, the dollar value of a unit of each service component was used as a weight before the component CRVS values were added. Independent cost data being unavailable, conversion factors were approximated from charge data to identify the average cost per CRVS unit within each component of care. For the sake of reliability, three different sets of conversion factors were devised, based on the three data sources available to the project; the overall scores on the measures correspond almost perfectly. The measure based on the Kaiser community survey was used because it was obtained from local data applicable to a variety of payors and settings. The formula used to compute the measures was: intensity = 2.16 CRVS Clin + 1.00 CRVS Lab + 1.82 CRVS Rad. The value for a CRVS unit was $3.58.

On the average, treatment was the most intensive for a physical examination episode (12.8 units) and least intensive for a URI episode (5.4 units). The diagnosis of AP symptoms involved a relatively intensive set of services (9.3 units). Although HYP episodes were of the longest duration, the overall intensity of their treatment was moderate (7.3 units). To a large extent, this discrepancy probably exists because HYP was less frequently the presenting condition, and hence fewer clinical services were incurred because of it.

The care consumed in treating each of the episodes is perhaps more meaningful when expressed in dollars. The fact that from 1970 to 1980 the physician services' component of the medical care portion of the consumer price index nearly doubled suggests a 1980 conversion factor for CRVS units

of about $7.16. If each episode had been billed for the care related to it, we estimate that the average charge incurred in 1980 dollars, based on a conversion factor of $7.16, would have been URI $38.67, UTI and HYP $52.27 each, AP $66.59, CP $46.54, and PE $91.65. (Costs involved in the use of pharmaceuticals are excluded since, as previously mentioned, such data were not available).

Care entails the provision of clinical services (services supplied directly by a provider) as well as ancillary services (laboratory and radiology procedures). Based on the CRVS measure, ancillary services appeared to account for at least one-third of the costs of treating each type of episode except URI. Ancillary services were particularly relied upon in treating symptomatic abdominal pain (accounting for 63 percent of the treatment costs) and in treating symptomatic chest pain (accounting for 50 percent of the treatment costs).

As might be expected, the types of resources used in treating the episodes under study varied according to the disease. Laboratory tests almost always were used in treating UTI (89 percent of episodes) and in providing physical examinations (93 percent of episodes). They were used less extensively, though still substantially, in the treatment of URI (25 percent), HYP (40 percent), AP (32 percent), and CP (44 percent). Radiology tests rarely were used in the treatment of URI, UTI, or HYP (less than 10 percent of such episodes). Radiology tests, however, appeared to be a frequently used discretionary treatment resource for AP and CP episodes (such tests were involved in about 40 percent of these episodes). Tests also were a typical component of the physical examination (68 percent of episodes). Use of specialty consultations and inpatient hospital facilities was relatively rare for all the conditions studied. Referrals were most likely for UTI (the presumption being that these referrals were to surgeons). Hospitalization was unlikely for any of the six conditions but was most likely for HYP and AP.

Table 8 presents selected data that provide a more detailed description of the ancillary care used in treating each of the episodes. For each condition, a maximum of seven procedures was identified according to the perceived likelihood that an internist would consider using them in treatment. No normative assumptions were made as to the desirability of each procedure in terms of quality of care. For certain conditions, the use of specific procedures appeared to be routine and commonplace across patients. This statement applies particularly to UTI, for which urine culture and urinalysis were used

for 76 to 80 percent of all episodes, and to PE, for which urinalysis, chest X-ray, and simple blood tests were used for 58 to 70 percent of all episodes. For the other conditions, the decisions to use a procedure apparently was made on a more case-specific basis, although certain procedures were favored. The ancillary care provided for URI, if any such care was supplied, appeared to consist almost exclusively of a throat culture (21 percent of the episodes). These observations are consistent with the results of "A Study in Ambulatory Medicine—Patterns in Care and Outcomes in Upper Respiratory Infection" by Dr. J. David Bristow, professor of medicine, Ore-

gon Health Sciences University, Portland, and his associates. Their unpublished study was undertaken with data similar to ours. They found that throat cultures represented 77 percent of all laboratory tests used in treating URI.

Conclusions

Many newspaper accounts portray medical care as involving massive applications of technology. Although such an image may accurately reflect the care provided for many conditions, it does not accurately reflect the situation in primary care. The data presented here indicate that except for chronic

Table 8. Distribution of episodes of care for six conditions by selected procedures ordered in their treatment

Disease condition with procedures used	Episodes with 1 or more procedures ordered		Procedures ordered per episode	
	Number	Percent	1	2 or more
Upper respiratory infection (671 episodes):				
Throat culture	142	21.1	137	2
Monospot test	3	.4	3	0
WBC, CBC, or differential[1]	21	3.1	20	1
Urinary tract infection (185 episodes):				
Urine culture	140	75.7	107	33
Urinalysis	148	80.0	108	40
Sensitivity tests for positive cultures	0	.0	0	0
Intravenous pyleogram	4	2.2	4	0
Cystoscopy	0	.0	0	0
WBC, CBC, or differential[1]	8	4.3	8	0
Hypertension (376 episodes):				
BUN (blood, urea, nitrogen)	51	13.6	47	4
EKG (electrocardiogram)	43	11.4	39	4
Chest X-ray	19	5.1	18	1
Serum potassium	105	27.9	84	21
Intravenous pyleogram	19	5.1	19	0
VMA (vanil mandelic acid)	7	1.9	6	1
Urinalysis	17	4.6	16	1
Abdominal pain (184 episodes):				
Urinalysis	25	13.6	25	0
Alkaline phosphase	7	3.8	7	0
Bilirubin	10	5.4	10	0
Abdominal film	8	4.3	8	0
Contrast studies	64	34.8	60	4
WBC, CBC, or differential[1]	31	16.8	31	0
Chest pain (111 episodes):				
Cardiac enzymes	1	.9	1	0
Chest X-ray	37	33.3	36	1
EKG (electrocardiogram)	43	38.7	41	2
Upper GI and esophagram	3	2.7	3	0
WBC, CBC, or differential[1]	4	3.6	4	0
Physical examination (2,473 episodes):				
Chest X-ray	1,675	67.7	NA	NA
EKG (electrocardiogram)	381	15.4	NA	NA
Cholesterol test	263	10.6	NA	NA
Pap (Papanicolaou) smear (vaginal)	772	31.2	NA	NA
WBC, CBC, or differential[1]	1,439	58.2	NA	NA
Urinalysis	1,739	70.3	NA	NA

[1] White blood count, complete blood count, white blood cell differential count.

NOTE: Since a physical examination involved only a single contact, "Procedures ordered per episode" is not applicable.

conditions, episodes of primary care tend to be brief; the majority do not extend beyond a single medical visit. A physical examination typically involves both laboratory and radiology services, but these services are far less frequently used in treating other kinds of episodes; laboratory services were used in 38 percent of all the episodes we studied and radiology services in 12 percent. Although ancillary costs accounted for one-third or more of the costs for each type of episode except URI, most episodes did not result in the use of sophisticated medical technology, and few led to referral or hospitalization.

The six conditions analyzed accounted for 31 percent of all internist office visits at K-P during the study period. However, our results may apply to a much broader range of primary care conditions. There is evidence that a physician's treatment of a few conditions reflects his or her treatment of other conditions (24). In addition, research by Gavett and associates indicates that 84 percent of primary care is for conditions "easy to diagnose and treat, requiring noncomplex facilities and medical techniques," whereas only 8 percent is complex, "possibly involving multiple problems, requiring extensive diagnosis, evaluation, and management . . . medical specialization, return visits" (25).

Implications

Except for that segment of care which involves hospitalization or the treatment of rare conditions, there appears little reason to fear for the overuse of sophisticated medical technology in primary care. A large proportion of primary care consists of a simple contact with a provider plus perhaps a few simple ancillary procedures. Even when followup is indicated (for example, for hypertension), care is more likely to involve integration of clinical observation and treatment into the ongoing care process than the application of sophisticated medical technology. This observation implies that in selecting a site for primary care, the close proximity of highly specialized medical equipment or a hospital need not be a major consideration, particularly if these are accessible within reasonable travel limits. It also suggests that present efforts to regulate capital expenditures for expensive equipment are unlikely to have much effect on how most primary care is delivered.

Cost savings in primary care are most likely if patients' demands for care can be met efficiently while at the same time limits are imposed on physicians' use of simple ancillary tests. Depending on the service, the use of medical care can be viewed as being more or less under the control of the patient or the provider. The results presented here suggest that the major costs of primary care arise from patient-initiated demand for treatment for simple conditions. Since many of these conditions are probably self-limiting, the treatment is more likely to consist of pain alleviation and anxiety reduction than formal "cure." The largest savings in primary care probably will result from efforts to meet patient demands for such treatment effectively without incurring unnecessary costs.

In primary care, a physician's decision-making appears to be narrowly circumscribed by the limited range of technology appropriate for most primary care conditions as well as by the important influence exerted by the patient (who determines whether or not to seek the initial treatment for a condition). The typical physician's decision in primary care may consist of determining whether to order a complete blood count, urinalysis, throat culture, chest X-ray, or other common procedure. The costs of these services cumulatively account for a substantial proportion of the treatment costs for an episode. Although some services are undoubtedly medically indicated, others may reflect physicians' efforts to satisfy their patients by providing unnecessary simple procedures. The cost-effectiveness of such physician behavior warrants further attention.

Finally, the results presented suggest that episodes of diverse conditions display distinctive characteristics. Perhaps the most obvious example rests in a comparison of URI (which tends to be treated in a single, uncomplicated, and nonscheduled visit) with hypertension (which tends to be detected and treated on an appointment basis in the course of providing care for other conditions). This example suggests that decisions on how to organize medical services need to be responsive to the different kinds of demands likely to be presented by each type of primary care condition. Further, it suggests that general analyses of "primary care" are unlikely to provide an understanding of the treatment that is received for specific types of conditions. Given the sad state of most data on primary care, this conclusion is particularly disturbing.

References

1. Murnaghan, J. M.: Ambulatory medical care data report of the conference on ambulatory medical care records. Med Care 11: (supp. No. 21) 205 (1973).
2. Gross, R.: Primary health care: a review of the literature through 1972. Med Care 12: 638–647 (1974).
3. Department of Health, Education, and Welfare: Forward plan for health FY 1978–1982. DHEW Publication No.

(OS) 76–50046. U.S. Government Printing Office, Washington, D.C., 1976.

4. Alpert, J. J., and Charney, E.: The education of physicians for primary care. DHEW Publication No. (HRA) 74–3113. U.S. Government Printing Office, Washington, D.C., 1973.

5. Jonas, S.: Some thoughts on primary care: problems in implementation. Int J Health Serv 3: 177–187 (1973).

6. Parker, A. W.: The dimensions of primary care. In Primary care: where medicine fails, edited by S. Andrepoulos. John Wiley and Sons, New York, 1974, pp. 15–76.

7. Rogers, D. E.: The challenge of primary care. Daedalus 81–104, winter 1977.

8. Fein, R.: Issues in primary care: the policy perspective. J Med Educ 50: 15–22 (1975).

9. Department of Health, Education, and Welfare: Current estimates from the Health Interview Survey: United States—1977. DHEW Publication No. (PHS) 78–1544. U.S. Government Printing Office, Washington, D.C., 1978.

10. Clute, K. F.: The general practitioner: a study of medical education and practice in Ontario and Nova Scotia. University of Toronto Press, Canada, 1963.

11. Peterson, O. L., Andrews, L. P., Spain, R. S., and Greenberg, B. G.: An analytical study of North Carolina general practice, 1953–1954. J Med Educ 31: 1–165, December 1956.

12. Brown, J. W., Robertson, L. S., Kosa, J., and Alpert, J. J.: A study of general practice in Massachusetts. JAMA 216: 301–306 (1971).

13. Mechanic, D.: General medical practice: some comparisons between the work of primary care physicians in the United States and England and Wales. Med Care 10: 402–420 (1972).

14. Riley, G. J., Willie, C. R., and Haggerty, R. J.: A study of family medicine in upstate New York. JAMA 208: 2307–2314 (1969).

15. Department of Health, Education, and Welfare: National Ambulatory Medical Care Survey: background and methodology. DHEW Publication No. (HRA) 74–1335. U.S. Government Printing Office, Washington, D.C., 1974.

16. Department of Health, Education, and Welfare: Health Interview Survey Procedure 1957–1974. DHEW Publication No. (HRA) 75–1311. U.S. Government Printing Office, Washington, D.C., 1975.

17. Solon, J., et al.: Delineating episodes of medical care. Am J Public Health 57: 401–408 (1967).

18. The role of prepaid group practice in relieving the medical care crisis. Harvard Law Rev 84: 887 (1971).

19. Saward, E. W., Blank, J. E., and Greenlick, M.: Documentation of twenty years of operation and growth of a prepaid group practice plan. Med Care 6: 231–244 (1968).

20. Saward, E. W., Blank, J. D., and Lamb, H.: Some information descriptive of a successfully operating HMO. DHEW Publication No. (HSM) 73–1311. U.S. Government Printing Office, Washington, D.C., 1973.

21. Gold, M.: Relative intensity of hospital-based primary care. Doctoral dissertation. Harvard School of Public Health, Cambridge, Mass., 1979.

22. Committee on Fees of the Commission on Medical Services: 1964 relative value studies. California Medical Association, San Francisco, 1964.

23. Donabedian, A.: Aspects of medical care administration: specifying requirements for health care. Harvard University Press, Cambridge, Mass., 1973.

24. Lyons, T., and Payne, B.: Interdiagnostic relationships of physician performance measures. Med Care 12: 369–374 (1974).

25. Gavett, J. W., Jacobs, A., and Thurber, C.: Physician judgments and resource utilization in private practice. Med Care 11: 310–319 (1973).

SYNOPSIS

GOLD, MARSHA (Maryland Department of Health and Mental Hygiene), and AZEVEDO, DANIEL: *The content of adult primary care episodes. Public Health Reports, Vol. 97, January–February 1982, pp. 48–57.*

In a research project undertaken to describe the content of adult primary care, episodes of illness for six common primary care conditions were analyzed: URI (upper respiratory infection, UTI (urinary tract infection), HYP (hypertension), AP (abdominal pain), CP (chest pain), and PE (physical examination). Data from the Kaiser-Permanente Medical Care Program—Oregon Region were used in the project.

Episodes of the six conditions studied tended to be of brief duration: at least half of the episodes of each condition except hypertension involved only a single medical visit. The physical examination episodes typically involved both laboratory and radiology services, but these services were less frequently used for the other five conditions. Few episodes involved a referral to a consultant physician, the use of sophisticated ancillary procedures, repeat tests, or a hospitalization.

If patients had been billed for the episode-related care involved in treating each episode, the average charge incurred (in 1980 dollars) would have been: URI $38.67, UTI and HY $52.27 each, AP $66.59, CP $46.54, and PE $91.65, excluding the costs of pharmaceuticals. Ancillary services accounted for one-third or more of the costs for each type of episode except URI. The results suggest that cost savings in primary care are likely to depend less on the control of sophisticated medical technology than on efficiently meeting patient-initiated demands for care and on influencing physician-generated ordering of simple ancillary procedures. The results also suggest the utility of analyzing the distinctive demands on the medical care system that are generated by diverse primary care conditions.