Do Physicians Satisfy Their Own Diagnostic and Treatment Criteria In the Care of Patients With Urinary Infections?

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This report investigates whether the organizational setting of medical care influences the effectiveness of treatment in patients with urinary infections. It describes the diagnostic and treatment criteria for 96 patients with urinary infections treated in a small military group practice. The criteria are derived from retrospective interviews with the physicians who treated the patients. Data on the process of medical care was collected from patient interviews and chart reviews. The degree of success of the physicians' meeting their own criteria was highly variable. Over all, 21 percent of the patients had all of their diagnostic and treatment criteria met. This result confirms the findings of a recent similar study on effectiveness of treatment of urinary infection in a university setting. The conclusion here is that organizing physicians into small (military) group practices does not seem to change the effectiveness of the medical care rendered to patients with urinary infections.

In a study of patients with urinary infections, Gonnella et al[1] discovered that medical care teams consisting of medical students and attending physicians failed to elicit important points in the medical history relating to urinary infections in fifty percent of the patients studied. Among the patients from whom the medical care teams did successfully elicit urinary complaints, only fifty percent received further investigation. The inference from this study is that well trained physicians at a university center offered sub-optimal medical care to patients with urinary infections.

Would the quality of the medical care have been higher in Gonnella's study if the organizational setting were different? This paper investigates this question by examining whether thirteen military physicians, each recently graduated from civilian university medical centers, satisfied their own diagnostic and treatment criteria in the care of patients with urinary infections.

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Setting of the Study

The patients studied in this report lived in a community of active duty and retired military personnel and their dependents numbering about 10,000. These people sought care at a western United States' military clinic and hospital with an inpatient census of 35. There were approximately 5,400 outpatient visits each month.

A patient could obtain an appointment within a few days, or he could be examined that same day on an emergency

basis. One of the physicians was on duty in the hospital during evenings and weekends for patients who decided that their medical problems could not wait until the next regular appointment session.

The physician group in this study consisted of thirteen active duty military physicians; each had recently entered military service. Each has subsequently returned to civilian medical practice after having completed his military obliga-

TABLE I

Consensus Criteria for Adults

Criteria	Requisites	Physician Agreement
Diagnosis	Should include a history of present illness, urinalysis, quantitative urine culture and sensitivity, percussion of back, oral temperature, and palpation of abdomen.	13/13
Treatment		
Antibiotics	A sulfonamide, ampicillin, tetracycline, or nitrofurantoin, appropriate to sensitivity studies, for at least 7 days.	12/12
Follow-up	A return visit within 21 days of diagnosis is necessary.	12/12
Urology Consult.	Should be obtained for all those patients with recurrent urinary infections or one episode of pyelonephritis.	10/11
BUN	Should be obtained for all those patients with recurrent urinary infections or one episode of pyelonephritis.	12/12
IVU	Intravenous urography should be obtained on all patients who experience one episode of pyelonephritis.	12/12

TABLE II

Consensus Criteria for Children

Criteria	Requisites	Physician Agreement
Diagnosis	Same as adults (Table I).	13/13
Treatment		
Antibiotics	Same as adults (Table I).	8/8
Follow-up	A return visit within 14 days of diagnosis is necessary.	8/8
Urology Consult.	Same as adults (Table I).	7/8
BUN and IVU	Should be obtained on all children on their first episode of a "severe" urinary infection or on second episode of "mild" infection.	7/8
VCUG	A voiding cystourethrogram should be obtained on all children on their first episode of urinary infections.	7/8

tion. All of the physicians had been graduated from American medical schools. Ten had undergone postgraduate training and six were board eligible. The author of this paper was one of the thirteen physicians.

Continuity of patient care was good for the following reasons: 1) the physician group was small enough so that intraclinic consultations were obtained easily, 2) the same physicians who saw appointments also saw emergencies, and 3) the physicians were responsible for both inpatient and outpatient care. These principles of optimal continuity of care were discussed by Navarro in his description of health care services in Cuba.[2]

Methods

A total sample of all patients diagnosed as having urinary infections within a consecutive four month period in 1970 were determined as follows. Carbon copies of all urinalyses and quantitative urine cultures for the four month period were reviewed. All reports that were frankly positive (>100,000 col/ml) or suspiciously positive (pyuria, hematuria, bacteriuria, >10,000 col/ml) were collected and the charts of those patients pulled. If the chart revealed that the physician had made the diagnosis of urinary infection, the patient was included in the study. If no mention of the diagnosis was made, the physician was asked about his recollection of the case and whether he had diagnosed a urinary infection at the time without having written it down. If his answer was yes, the patient was included in the study, and if no, the patient was rejected.

Patients determined to have had a urinary infection by the above method were then interviewed. Questions regarding their acute illness, treatment course and subsequent follow-up were asked. The patient interviews were conducted from three to eight months after the acute illness.

During the time the patient care data was being collected, the physicians were interviewed individually to obtain a list of diagnostic and treatment criteria for urinary infections. Questions were asked pertaining to the way a patient with a urinary infection should be diagnosed and treated. Should the physician elicit a history of a chief complaint, pain on urination, previous urinary infections, urinary calculi or prior urinary catheterization? How much importance should the physician place on the history? What points should he note in the physical examination? What laboratory tests should he order in aiding him in his diagnosis and treatment? At what interval should he re-examine the patient or the patient's urine? Should he treat with antibiotics? What kind and for how long? On which patients should he obtain a urological consultation? Which patients needed x-rays?

Each physician knew that his answers were going to be used to establish a set of diagnostic and treatment criteria for his own patients. Because there was some variability in the criteria for the physicians, a consensus set of criteria was established for adults and children as shown in Tables I and II.

The fraction listed under "physician agreement" in Tables I and II represents the consensus of agreement for that criterion. The numerator of each fraction refers to the number of physicians who insisted upon this criterion and the denominator refers to the number of physicians who wished to respond to questions pertaining to that criterion.

Results

The thirteen physicians diagnosed urinary infections in 119 patients within a consecutive four month period in 1970 (inpatients and outpatients combined). This represents an incidence of 4 percent per year, which is similar to previously published data on incidence.[3] Interviews and chart reviews were conducted on 96 of these patients. The remaining 23 patients were omitted from the study either because they were not available for interview or because their charts could not be found for review.

The 96 patients comprised a diverse group. Eighty were adults and 16 were children (ages 15 years and under). Among the adults, 74 were married. The ages ranged from six months to 63 years, with a median age of 25 years. Ninety of the total group were Caucasian. Most of the patients had cystitis and only a few had pyelonephritis, but there was a sizable number in whom localization of the urinary infection could not be made on clinical or laboratory grounds. Thus, all patients in this study have been combined into one category — urinary infections.

Figure 1 gives the breakdown of the patients studied and the number in whom the diagnostic and treatment criteria were successfully met. Thirty-eight percent of the children and 18 percent of the adults had both sets of criteria satisfied (21 percent overall).

Table III lists a breakdown of the diagnostic procedures and the frequency of their use. In making their diagnoses, the physicians used most frequently a history of the present illness and a quantitative urine culture.

The degree of success of the physicians in meeting their own diagnostic and treatment criteria is listed in Table IV (adults) and Table V (children).

The degree of success of the physicians in meeting their own diagnostic criteria was higher among the children (69 percent) than among the adult group (46 percent). Four children required and received additional tests or consultations. Forty-six percent of the adult patients had complete diagnostic workups. Twelve adults should have had further investigations; four of these underwent the evaluations. None of the six adult patients for whom a urological consultation was advised had received the consultation by the time of the patient interview several months later.

Four of the 96 patients did not take any antibiotics at all; the reason for this was not clear in each case. Three of these patients continued to have symptoms referable to the urinary tract up to three months after being diagnosed. Overall, 83 percent of the adults and 75 percent of the children took the prescribed antibiotics for at least seven days. There were a total of twelve patients, adults and children, who took antibiotics for less than the seven suggested days. The symptoms of eight of these patients abated within a few

days after starting their treatment. Although there were no documented recurrences in the remaining four patients, they experienced intermittent symptoms since the completion of their initial, abbreviated treatment.

TABLE III

Frequency of Diagnostic Procedures

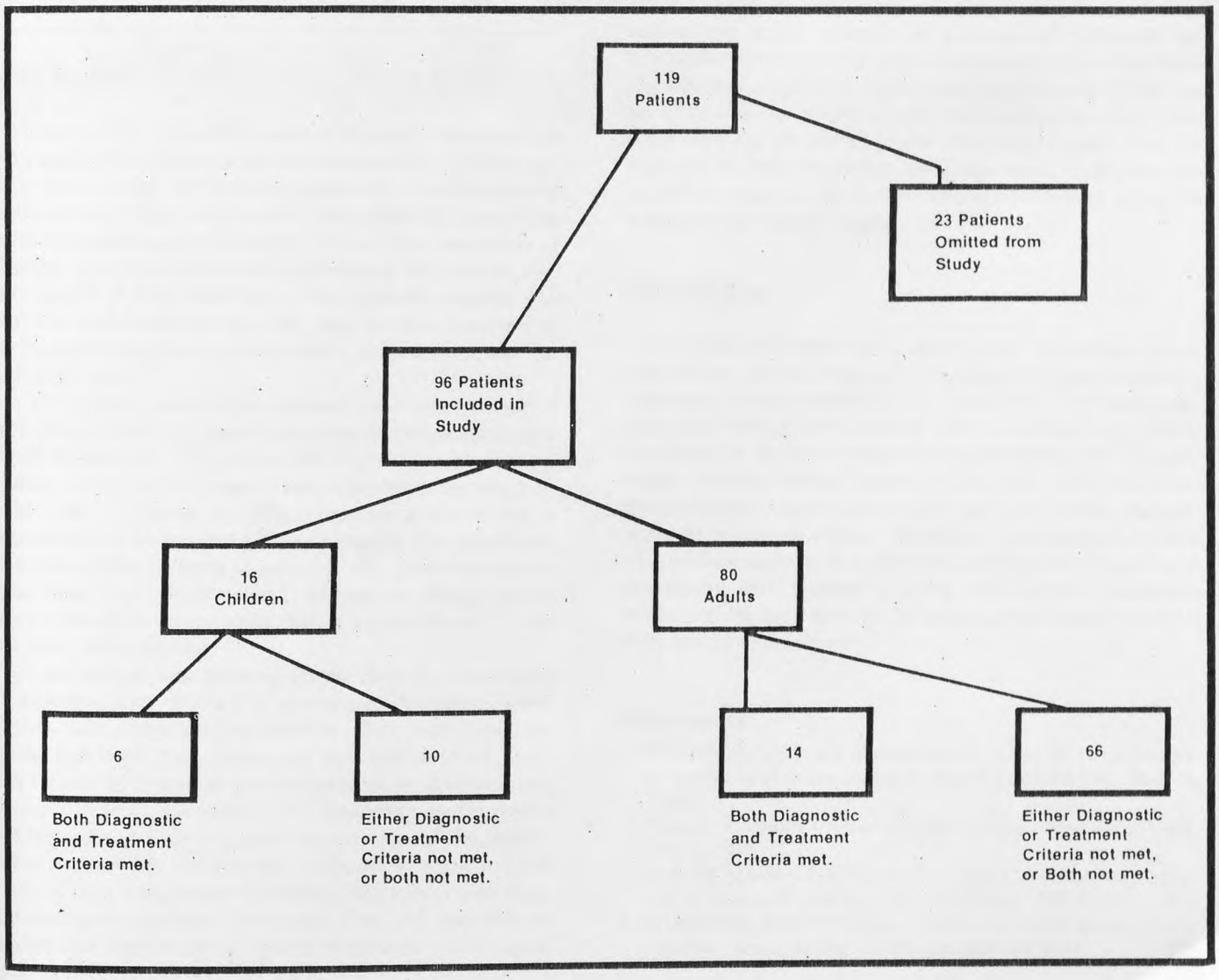
Diagnostic Procedure	Frequency of Performance
History of the Present Illness	100%
Quantitative Urine Culture	94%
Urinalysis	79%
Examination of the Patient	59%

TABLE IV

Effectiveness in Meeting Criteria for Adults

Criteria	No. of Patients to Which Criteria Applies	% Patients in Whom Criteria Were Met (% Success)
Diagnosis	80	46
Treatment		
Antibiotics	80	83
Follow-up	80	51
Urology Consult.	6	11
BUN	4	75
IVU	4	50

Figure 1. Distribution of patients with diagnosed urinary infections. Number in whom both the diagnostic and treatment criteria were met.



Follow-ups were completed on 63 percent of the children and 51 percent of the adults. On the basis of interviews with these patients, those who became asymptomatic were not likely to return for a repeat urinalysis, urine culture or a discussion with the doctor.

TABLE V

Effectiveness in Meeting Criteria for Children

Criteria	No. of Patients To Which Criteria Applies	% Patients in Whom Criteria Were Met (% Success)
Diagnosis	16	69
Treatment		
Antibiotics	16	75
Follow-up	16	63
Urology Consult.	2	100
BUN and IVU	2	100
VCUG	1	100

Discussion

Kessner, et al,[4] described a set of criteria in the diagnosis and treatment of urinary tract infections which could be applied to a group of patients treated in a neighborhood health center. The criteria were formulated by "practicing family physicians and specialists." No mention was made of whether the physicians who established the criteria also participated in the treatment of the patients studied. No data was presented on how the criteria were matched to the medical care given so as to offer a judgement about the quality of care.

In this study, a technique similar to Kessner's "tracer"[4] method was used to characterize part of the medical care offered to patients. It appears to be a feasible method in estimating the quality of care given. Care must be taken to avoid a set of criteria that is too rigorous and one that is constructed by an outside group of experts. The physicians who treated the patients reported in this study had established their own set of criteria. Judgements about patient care are therefore more valid than if an outside set of criteria had been applied.

The population base from which the patients were drawn is reasonably well defined in this study. This allows comparisons with other studies done at other institutions, assuming that their populations are also well defined. Gonnella's study[1] of physician performance in the diagnosis and treatment of urinary infections at a university center suffers from not having a demographic description of the study's patient population. The strength of Gonnella's study is that he was able to independently identify all patients with diagnosis and prescribe their treatment. Thus, he was able to measure the frequency of missed diagnoses. Once again, however, he applied an external set of criteria to the medical care offered to the study population.

In the study presented here, it is not clear why the physicians failed to meet their own criteria. One possibility is that the criteria were established several months after the physicians initially diagnosed and treated some of their patients. Thus, their criteria may have changed with time. Another possibility is that real criteria in diagnosis and treatment might not be derivable by questioning physicians. In asking a physician how he would diagnose a urinary infection, he might respond as if he were taking a test in medical school rather than expressing his feelings about what is truly important in making a diagnosis. The data in Table III supports this point, since obtaining a history suggestive of urinary infection and obtaining a quantitative urine culture were the main criteria used by the physicians, even though they said that they should have examined their patients and ordered a urinalysis in every case. If one were to consider eliciting a proper history and ordering a quantitative urine culture as the sole components of the diagnostic criteria, the thirteen study physicians would have performed very well, meeting their criteria more than 94 percent of the time.

Perhaps a more realistic way to establish a list of criteria for the diagnosis and treatment of urinary infections is to survey the actual practice of a group of nationally renowned internists to first determine exactly how they handle patients presenting with urinary complaints. Thus, the set of criteria would mirror what the experts *do* rather than what they say *should be done*. The criteria could then be matched to other physicians and judgements made as to the quality of the care rendered. This methodology might be employed in future studies.

Conclusion

This study indicates that a small group of military physicians often did not meet its own diagnostic and treatment criteria for urinary infections. To this extent, the study supports the findings of Gonnella, where medical care teams consisting of medical students and attending staff at a university medical center failed to carry out indicated treatment courses in approximately 50 percent of those they diagnosed as having urinary infections. Comparison of these two studies suggests that the effectiveness of physicians in diagnosing and treating patients with urinary infections might not be improved by changing the setting in which they practice medicine.

References

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