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Surgeons General of the Past

(The thirteenth in a series of brief biographies)

James Mills Browne, the thirteenth Chief of the Bureau and ninth Surgeon General was born in Hinsdale, N.H., on 10 May 1831. He was graduated from the Harvard University Medical School in 1852 and appointed Assistant Surgeon in the Navy on 25 March 1853. His first duty was on the store ship Warren at Sausalito across the bay from San Francisco. In September 1854 this ship was anchored at Mare Island and became the residence of the Navy Yard's first Commandant, CDR David G. Farragut, Doctor Browne thus being the first medical officer at the Mare Island Navy Yard. His next sea service included surveying duty on the Pacific coast and experiences in an Indian war on the shores of Puget Sound. After promotion to Past Assistant Surgeon on 12 May 1858 he was attached to the African Squadron engaged in suppression of the slave trade. Commissioned Surgeon on 19 June 1861 he was ordered to the steam sloop Kearsage and was Senior Medical Officer when under the command of CDR John A. Winslow she engaged and sank the celebrated Confederate cruiser Alabama. Following the Civil War he supervised construction of the Mare Island Naval Hospital and became its first Commanding Officer. He was later Fleet Surgeon of the Pacific Fleet and in 1883 became the first Director of the Museum of Naval Hygiene just established in Washington. Doctor Browne had been promoted to Medical Inspector 1 December 1871 and to Medical Director 6 October 1878. He was appointed Surgeon General by President Cleveland on 2 April 1888 and held the office until 10 May 1893. During the eighties, the famous "White Squadron" was organized; and new ship design features made possible better ventilation, heating, lighting, berthing spaces, refrigeration, and larger improved sickbays. Known as a man of distinguished appearance and a gifted orator, Surgeon General Browne died 7 December 1893.



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THE KIDNEY IN ESSENTIAL HYPERTENSION

VICTIM OR CULPRIT

Herbert Chasis MD and David S. Baldwin MD, Circulation 34(5):921-924, November 1966. "By permission of the American Heart Association, Inc."

The frequent association of hypertension and intrinsic renal diseases has been universally recognized, and more recently a relationship has been demonstrated between hypertension and the concurrence of major renal artery disease and specific renal functional abnormalities. In searching for the etiology of essential hypertension, it seems logical, therefore, to consider the possibility that here also the kidney may play a causal role. In examining this thesis, we have found renal functional abnormalities which suggest that essential hypertension may arise from an alteration in perfusion of the kidney differing only in extent and site from that in renal artery stenosis. We are presenting here a brief summary of the evidence bearing on the guilt or innocence of the kidney in essential hypertension.

The high incidence of renal arteriosclerosis in patients with established hypertensive disease has been cited to support the thesis that disease of the smaller renal vessels plays a primary role in the causation of hypertension. Moritz and Oldt re-examined this relationship in 100 patients with well-established hypertension of many years' duration and in a well-controlled study found renal arteriosclerosis at necropsy in 97 percent. Absence of arteriosclerosis, on the other hand, may just as reasonably be offered as evidence against a primary role of renal vascular changes in essential hypertension, and there is substantial evidence that structural change in the renal arterioles is not to be found in a significant number of instances. Bell in an autopsy study of 588 patients who died of essential hypertension noted the absence of renal arteriosclerosis in 32 percent, and Castleman and Smithwick found

either no or insignificant vascular disease in 28 percent of 100 open renal biopsies in patients with well-established essential hypertension. The presence of renal arteriosclerosis in normotensive individuals can be used as an additional argument against the primary role of structural arteriolar disease in the causation of hypertension. Bell reported diffuse renal arteriosclerosis in 16.3 percent of normotensive subjects over the age of 50 years with occasional hyaline deposits in an additional 22.1 percent; he also emphasized the frequency and severity with which this lesion occurs in normotensive patients with diabetes mellitus.

It seems unlikely that attempts to establish the presence or absence of renal vascular disease could settle the question as to whether alterations in the renal circulation play a primary role in the genesis of human hypertensive disease. When arteriosclerosis is found, it is not possible to be certain whether it antedated the onset of hypertension; when arteriosclerosis is not observed, the validity of this observation depends on how reliably it can be stated that this typically focal lesion is absent unless the entire renal vasculature is studied. The possibility remains, therefore, that disease of the renal vascular bed antedates the onset of hypertension but is not readily demonstrable by the techniques which have conventionally been used for the structural examination of the kidney.

An inherent limitation of the anatomic approach derives from the circumstance that the appearance of the renal vessels may not characterize the functional status of the renal circulation. If an alteration in renal hemodynamics is responsible for a renal pressor mechanism in essential hypertension, the finding of arteriosclerosis does not necessarily indicate that this specific alteration is present. Similarly, failure to find arteriosclerosis does not ensure that the hemodynamic alteration capable of

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producing a pressor mechanism is not present. It would appear that physiological exploration of the renal circulation and specific renal functions might be more productive in an examination of the role of the kidney in the genesis of essential hypertension. Abnormalities in flow, pressure and resistance, as well as alterations in sodium, solute, and water excretion could be present in kidneys without demonstrable structural change and yet have pathogenetic significance.

Goldring and co-workers found a reduction in renal blood flow below the mean normal value and an increase in filtration fraction in essential hypertension. Further evidence that renal blood flow may in fact be reduced, even in those instances in which statistically its value falls within the normal range, was adduced by Baldwin and associates from the demonstration that one kidney had significant reduction in flow as compared to its mate in the majority of 50 patients early in the course of essential hypertension. Goldring and co-workers found that functional tubular mass (Tm_p) was also reduced but that the ratio of effective blood flow to functional tubular mass ranged downward from the mean normal value, indicating the presence of relative renal ischemia. Since this renal ischemia could be reversed by the administration of pyrogen, it was attributed to renal arteriolar constriction, representing the kidneys' participation in the generalized vasoconstriction present in essential hypertension. It was subsequently shown, however, that the degree of vasoconstriction in the kidney actually exceeds that in other vascular beds. Brod and associates have recently described exaggerated vasoconstrictor reactivity in the skin, kidney, and splanchnic bed during physical and intense mental effort in patients with essential hypertension; they attempted to explain the permanent elevation of blood pressure in essential hypertension as a manifestation of this altered reactivity. However, decreased renal blood flow and increased renal resistance may reflect neither the kidneys' participation in generalized vasoconstriction nor their specific response to stimuli in hypertensive patients but may represent, in fact, the critical alteration in hemodynamics which initiates a renal pressor mechanism in essential hypertension.

In examining the thesis that renal functional defects might be characteristic of the kidney in essential hypertension, it was thought that subtle abnormalities in sodium, water, and solute excretion not

evident in studies of overall function might be revealed by simultaneous comparison of the separate kidneys. In order for renal functional impairment reasonably to be interpreted as primary, it was necessary to study patients judged to be early in the course of their disease and to this end we chose patients without retinopathy, cardiomegaly, or gross evidence of renal functional impairment. A disparity in sodium excretion and urinary volume between the two kidneys exceeding the limits established in normotensive subjects was observed in more than half of 50 hypertensive patients. By relating sodium excretion to glomerular filtration rate, two patterns of renal dysfunction were identified: one suggested total loss of function in some nephrons; the other, decreased sodium excretion due either to decreased filtered load or to excessive tubular reabsorption. These two distinct patterns of renal dysfunction have not been assigned separate pathogenetic significance; it may well be that they represent sequential manifestations of a common alteration in renal circulation.

Disparity in sodium excretion between the two kidneys in patients with essential hypertension raised the possibility that an abnormality in the handling of sodium might be typical of the kidney in this disease. Since the renal capacity to form solute free water (C_{H_2O}) depends on sodium reabsorption in specific segments of the nephron, a study of the diluting capacity was undertaken in an effort further to characterize the excessive sodium reabsorption. Free water formation was examined during osmotic loading to permit comparison at the same levels of solute excretion and was found to be equal in normotensive and hypertensive subjects. However, by comparing the separate kidneys it was possible to demonstrate impairment of free water formation in the majority of hypertensive patients as evidenced by significant disparity between the two kidneys. Once again, two patterns of dysfunction were identified: in one, free water and sodium excretion were decreased in one kidney in proportion to a decrease in its filtration rate, suggesting total loss of function in some nephrons; in the other, free water and sodium excretion were decreased out of proportion to decrease in filtration rate. In this latter group C_{H_2O} in the antinatriuretic kidney was normal for the level of solute excretion or could be increased to normal during mannitol diuresis, suggesting that the decrease in C_{H_2O} resulted from reduced delivery of sodium to the diluting segment secondary to excessive reabsorption of sodium in more proximal segments of the nephron.

In order to explore further the possibility that excessive reabsorption of sodium occurs in the proximal portions of the tubule early in the course of essential hypertension, examination of urinary concentrating capacity was then undertaken. It was found that urinary osmolality was decreased in hypertensive patients at all levels of solute excretion. However, when compared to the normal at the same solute load per nephron (per 100 ml of glomerular filtration), osmolality was decreased at low but not at high solute loads. This impairment of the urinary concentrating mechanism at low solute loads was attributed to excessive reabsorption of sodium proximally, since normal osmolality resulted when sodium delivery to more distal segments of the nephron was experimentally enhanced. We have interpreted this impairment as additional evidence of an abnormality in sodium reabsorption characteristic of early essential hypertension.

Renal ischemia in essential hypertension, which has been adduced from reduction in the ratio of renal blood flow to functional tubular mass, may be due either to uniform decrease in blood flow throughout the vascular bed or to focal decreases resulting from an abnormality in the intrarenal distribution of flow. Since conventional clearance can only provide information concerning total renal blood flow, a method of determining the intrarenal distribution of blood flow utilizing indicator-dilution curves recorded across the renal vascular bed was developed. Utilizing a series of integral transformations, a continuous distribution curve was derived which expresses the relative frequency of theoretical units having different specific blood flows (blood flow per unit volume). The mean specific blood flow was lower in hypertensives as compared to normotensives, but the shape of the frequency distribution curve was unaltered in hypertensives, indicating that the specific blood flow is reduced uniformly throughout the vascular bed. These results suggest that hemodynamic changes are uniform throughout the kidney. However, the dye-dilution method may not be capable of detecting small but significant variations from the normal. Furthermore, focal changes in arteriolar resistance and flow due to structural disease may be present but masked either by general arteriolar constriction or by alterations in hemodynamics of the postglomerular capillary bed. In any event, the demonstration of uniform reduction in specific blood flow does not necessarily absolve

the kidney since general rather than focal ischemia may well be the pathogenetic hemodynamic alteration in essential hypertension.

Even if the kidney were indicted as culprit by identification of a characteristic pattern of hemodynamic and functional abnormality in essential hypertension, the exact mechanism by which the elevation in blood pressure is produced would still remain unknown. In this regard investigative programs concerned with the renin-angiotensin system and the relationship between it and aldosterone production may provide evidence which bears on this question. Morris and associates did not find an increase in concentration of angiotensin II in the arterial blood of patients with essential hypertension, and Kahn and co-workers reported such small increases that they were unable to conclude "as to its effectiveness in producing vasoconstriction." It has been suggested that increased secretion of aldosterone, through its relationship to the renin-angiotensin system, may be of importance in essential hypertension, but Laragh and associates have demonstrated that aldosterone metabolism is normal in hypertensive disease. It appears that a humoral pressor agent arising directly or indirectly from the kidney is yet to be demonstrated in essential hypertension.

It is apparent from this review that the structural and functional abnormalities thus far demonstrated have not established the pathogenetic role of the kidney in essential hypertension. Aside from its inability to characterize the dynamics of the renal circulation, the anatomic approach does not permit one to choose between the primary or secondary nature of the vascular changes. On the other hand, the renal hemodynamic and functional alterations (relative renal ischemia, increased filtration fraction, decreased maximal tubular excretory capacity, reduced sodium excretion relative to filtration, decreased formation of free water, and impaired elaboration of an osmotically concentrated urine) are demonstrable early in essential hypertension and favor a primary renal mechanism. Continued exploration of the kidneys' hemodynamics and functions early in essential hypertension has resulted in the disclosure of an increasing number of abnormalities. We believe that further study may well establish its role as culprit.

(The references may be seen in the original article.)

RELAPSES IN PULMONARY TUBERCULOSIS

Francis Segarra MD FCCP and David S. Sherman MD FCCP** With the technical assistance of Muriel Gagnon RN Boston, Massachusetts, Dis Chest 51(1):59-63, January 1967.*

Tuberculosis still remains a serious problem in the United States. An estimated 35 million people in the United States today have been infected with the tubercle bacillus. Of these, if present conditions prevail, approximately one person in 20 can be expected to develop active tuberculosis during his lifetime, or 1.75 million. Furthermore, the latest statistics show a slight increase in the incidence of the disease in the United States, as well as in Europe. The problem of relapse in pulmonary tuberculosis is of utmost importance from the practical point of view of treating the disease. It is also a very difficult problem to understand, due to the unpredictable character of the disease, its evolution in successive outbreaks and remissions, the polymorphic varieties of tuberculosis, the long term follow-up required and the numerous factors that can precipitate or alter the course of the disease, proper diet, rest, alcohol, diabetes, etc.

Moreover, there is a new trend in caring for the tuberculous patient, from the long accepted sanatorial environment to the out-patient clinic. Since the training of new chest physicians has been greatly neglected, tuberculous patients will be more and more in the hands of general practitioners or internists who follow in the interpretation of the chest x-ray films, the verdict of the radiologist for whom stable roentgenograms with fibrotic appearance is synonymous with cure. This is another reason, therefore, to give prime importance to the study of relapses in pulmonary tuberculosis.

Wide discrepancies are found among investigators who use different concepts and definitions so that comparable surveys of results are indeed unobtainable and definite conclusions are impossible to reach. For instance, most of the authors in the Scandinavian countries consider relapse only after a period of inactivity not less than three years. A patient is con-

sidered inactive, according to the National Tuberculosis Association, when roentgenograms are stable for more than six months and the sputum is negative for more than six months. The term relapse for the authors implies either the reappearance of bacilli in the sputum or a change in the x-ray films or both.

Materials and Methods

It is the purpose of this study to analyze the incidence of relapses among patients with pulmonary tuberculosis who were discharged as inactive from the Boston Sanatorium from January, 1956 to January, 1963. It comprises a group of 828 patients followed up at the Boston Public Health Out-Patient Clinics for a period which extended from a minimum of one year to a maximum of eight years, January, 1964.

Patients were given isoniazid (INH) from 300 mg. to 600 mg. and para aminosalicylic acid (PAS) 12 gm. or INH alone, for one to three years after discharge, according to the extent of the disease. Patients were seen at the out-patient clinic every three months and physical examination, chest x-ray films, and sputum cultures were taken at each visit. No tests to control the taking of the drugs were carried out. Allen *et al.* found 20 percent of the patients on INH and PAS did not take PAS in the out-patient clinics in Ontario, Canada.

Of 828 inactive patients, 97 relapsed (11 percent). Phillips in a study of inactive cases discharged from sanatoria in 1955 and 1956 reports an 8.5 percent relapse rate.

Incidence of Relapse According to the Extent of Disease

The incidence of relapse is not the same for all patients, but varies greatly according to the original extent of the disease. Minimal, moderate and far advanced cases show rates of relapse significantly different, 6.6 percent, 9.9 percent and 19.3 percent

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(Aided by a Medical Research Grant from the Boston Tuberculosis Association).

respectively. Of 379 patients with the disease confined to one lung, 31 relapsed, (8.1 percent), while of 436 patients with bilateral disease, 67 relapsed (15.4 percent).

TABLE 1—RELAPSES ACCORDING TO THE EXTENSION OF TUBERCULOSIS

Extension of Tuberculosis	No. Patients	No. Relapses	Percent Relapses
Minimal	272	18	6.6
Moderate	303	30	9.9
Far Advanced	253	49	19.3

Relapse According to Race

Of 694 white patients, 12.6 percent relapsed as against 8.1 percent of the negroes; none of the 23 Chinese patients relapsed. However, these values are not statistically significant. The same prevails when patients of different races are grouped into three categories of minimal, moderately advanced, and far advanced disease.

TABLE 2—RELAPSES ACCORDING TO RACE

Race	No. Patients	Percent Relapses
White	694	12.6
Negro	111	8.1
Oriental	23	0

Relapses According to Sex

Men relapse significantly more often than women, 14 percent versus 6.1 percent ($X^2=12.19$, $P>.001$). However, the portion of patients, according to the stage of the disease, minimal, moderate and far advanced, was for men 28.3 percent, 37.4 percent and 34.3 percent and for the women, 41.8 percent, 33.2 percent and 25 percent, respectively. These figures show a predominance of moderately and far advanced cases among men. When it is compared to the rate of relapse in men and women in each stage of the disease, it is seen that women have a tendency to relapse less than men, but this tendency is not large enough to be statistically significant.

Relapses According to Marital Status

There are some differences in the relapse rate according to the marital status: 12 percent in the single group, 9.6 percent in the married group, 15.5 percent in the widow/er group and 15.2 percent in divorced or separated patients; however, those differences are not statistically significant. When analyzing the results in each sex, the highest rate of relapses in men is seen among those divorced or separated, and the lowest among those married, while in women, the highest rate is observed among the married and the lowest in the divorced and separated; but here again this trend has no statistical value.

Relapse and Age

There is a significant difference in the rate of relapse according to age. The older the patient the greater the chances of relapse ($X^2=18.86$, $P=<.01$).

TABLE 3—RELAPSE ACCORDING TO MARITAL STATUS AND SEX

Marital Status	Men		Women		Total	
	No. of Patients	Percent Relapses	No. of Patients	Percent Relapses	No. of Patients	Percent Relapses
Single	191	14.1	74	6.7	265	12.0
Married	222	11.2	142	7.0	364	9.6
Widow/er	56	19.6	21	4.7	77	15.5
Divorced or Separated	80	21.2	38	2.7	118	15.2

The age factor is quite obvious for those with minimal pulmonary tuberculosis, but much less significant in those patients with moderately advanced or far advanced disease.

TABLE 4—RELAPSES ACCORDING TO AGE

Age Group	No. Patients	Percent Relapses
20	54	3.7
20-29	108	3.7
30-39	129	7.8
40-49	195	15.3
50-59	190	16.3
60-69	105	12.3
70	43	13.9

Relapse According to Age and Sex

There is a significant difference in the rate of relapse by age in men. Thus the chance of relapse increases after 30 years, and much more so after 40 years of age ($X^2=11.88$, $P=<.05$). In women, this difference is less obvious and is not statistically significant.

Relapses and Alcoholism

Chronic alcoholics represented 17.7 percent of our group, a much lower percentage when compared with 40 percent found in all patients at the Boston Sanatorium. This striking difference is explained by the fact that alcoholics have generally a much poorer follow-up record and consequently the number of them in the out-patient clinic is less than at the sanatorium where they are brought in in the acute state.

TABLE 5—RELAPSES ACCORDING TO AGE AND SEX

Age Group	Sex			
	Men		Women	
	No. Patients	Percent Relapses	No. Patients	Percent Relapses
20	22	4.5	32	9.4
20-29	41	2.4	67	4.4
30-39	61	8.1	68	7.3
40-49	152	17.1	43	9.3
50-59	159	18.8	31	3.2
60-69	83	14.4	22	4.5
70	33	12.1	10	20.0

Alcoholic patients relapse two to three times more than non-alcoholics (23 percent versus 9.2 percent [$X^2=22.5$, $P=<.001$]), and this difference remains valid in the three groups of minimum, moderately advanced and far advanced disease.

Distribution of Relapses in Years After Discharge

Of the 97 relapses, 41.7 percent occurred in less than one year, 29 percent between one and two years, 15.8 percent between two and three years, and 13.4 percent between three and eight years of follow-up. It is interesting to note that this distribution in the timing of the relapse is similar to the findings observed in the pre-chemotherapy era.

Type of Relapse

In 70 percent of our relapse cases, sputum was found positive for acid-fast bacilli, and 63 percent

TABLE 6—RELAPSES AND ALCOHOLISM

	No. Patients	Percent Relapses	Minimal		Moderate		Far Advanced	
			No. Patients	Percent Relapses	No. Patients	Percent Relapses	No. Patients	Percent Relapses
Alcoholics	147	23.1	46	15.2	57	22.8	44	31.8
Non-alcoholics	681	9.2	223	9.9	240	7.0	205	17.5

TABLE 7—DISTRIBUTION OF RELAPSES IN THE FOLLOW-UP TIME

Extension of Tuberculosis	Total	1 Year		1 - 2 Years		2 - 3 Years		3 - 8 Years	
		Relapses	Percent	Relapses	Percent	Relapses	Percent	Relapses	Percent
Minimal	18	8	44.5	8	44.5	1	5.5	1	5.5
Moderate	30	11	36.8	6	20.0	5	16.7	8	16.0
Far	49	22	44.6	14	28.7	9	18.4	4	8.1
Advanced									
Total	97	41	41.7	28	29.0	15	15.8	13	13.1

presented changes on x-ray examination. Relapses were strictly bacteriologic, with no radiologic changes in 10 percent, whereas 6 percent had x-ray changes not accompanied by positive sputum. Clinical symptoms of different types and degree were observed in 72 percent of the relapses.

Conclusions

1. Of 828 patients with "inactive" tuberculosis 97 (11.7 percent) relapsed.
2. The incidence of relapse varies greatly according to the extent of the disease.

	Percent
Minimal	= 6.6
Moderately advanced	= 9.9
Far advanced	= 19.3
Unilateral	= 8.1
Bilateral	= 15.4

3. Race does not play a significant part in the tendency to relapse.
4. Among our patients, 14.4 percent of the men relapsed versus 6.1 percent of the women; however, when the comparison is made according to the extent of the disease, minimal, moderately advanced and far advanced, the difference is minimized and is not statistically significant.
5. In regard to marital status, the relapse rates were as follows: —12 percent in the single group, 9.6 percent in the married group, 15.5 percent in the widow/er group and 15.2 percent in those divorced or separated. However, those differences are not statistically significant.

6. The age factor is significant: —the older the patient the greater the chances of relapse. In women,

however, the age factor is less significant than in men.

7. In addition to the extension of the disease, alcoholism is the most important factor related to relapse. Alcoholics relapsed 23.1 percent versus 9.2 percent in non-alcoholics.

8. Timing of the relapses: 41.7 percent occurred in less than one year, 29 percent in the second year, 15.8 percent in the third year, and the remaining 13.4 percent between three to eight years of follow-up.

9. In 70 percent of our relapse cases sputum was found positive for acid-fast bacilli, and 63 percent presented radiologic changes.

Summary

From January, 1956 to January, 1963, 828 patients were discharged with "inactive" tuberculosis from the Boston Sanatorium. They have been followed-up from a minimum of one year to a maximum of eight years with an overall relapse rate of 11 percent.

The two most important factors related to the rate of relapse are the stage of the disease and association of tuberculosis with chronic alcoholism. Among those with minimal pulmonary tuberculosis the relapse rate was 6.6 percent, those with moderately advanced, 9.9 percent and those with far advanced 19.3 percent. The rate of relapse in non-alcoholic patients was 9.2 percent versus 23.1 percent for those with a simultaneous history of chronic alcoholism.

(The references may be seen in the original article.)

PERCUTANEOUS RENAL BIOPSY—AN IMPROVED METHOD USING TELEVISION MONITORING AND HIGH-DOSE INFUSION PYELOGRAPHY

MAJ Jean K. Haddad MC USA and MAJ Richard L. Mani MC USA Frankfurt/Main, Germany. Reprinted from the Archives of Internal Medicine February, 1967, Vol. 119, pp. 157-160 Copyright 1967, by American Medical Association.

In 1954 Kark and Muehrcke described a technique for percutaneous renal biopsy which involved the approximation of the kidney site by the transfer of bony landmarks to the patient's back from a preliminary intravenous pyelogram film and the insertion of the Franklin modification of the Vim-Silverman biopsy needle into the patient's flank to secure renal tissue. This method has enjoyed wide acceptance and presently represents the procedure of choice in most institutions.

Unfortunately, even in experienced hands, there is a failure rate of 10 percent to 20 percent with this method because of the "blind" approach. Furthermore, the complication rate is high and includes severe bleeding which may require transfusion or even nephrectomy and the formation of arteriovenous fistulae at the biopsy site. Consequently, there is a reluctance to biopsy the kidney via the percutaneous route, and, at the Massachusetts General Hospital, this method has been abandoned in favor of open surgical biopsy. Our experience with percutaneous renal biopsy performed in 23 patients over the last two years leads us to believe that such a drastic change in technique is not justified. This communication describes a modification of percutaneous renal biopsy which involves the use of television monitoring and high dose infusion pyelography. In our hands, this method has proved itself successful and safe.

Method

After preliminary renal function and coagulation studies, the patient is given a cathartic on the evening before and 100 mg secobarbital one hour prior to the biopsy. In the radiology department, the patient lies prone on the fluoroscopy table on a

foam rubber pillow for abdominal compression. A preparation of 1 cc/lb of 50 percent sodium diatrizoate (Hypaque Sodium) in an equal volume of 5 percent dextrose water is infused intravenously as rapidly as possible through a large bore needle.

During the ten-minute wait for renal opacification, we instruct the patient in the purpose and technique of the procedure, stressing the importance of maintaining a comfortable but uniform depth of respiration throughout. Using the television monitor, the fluoroscopist locates the opacified kidney and, on end-inspiration, places the tip of a sterile pointer on the skin overlying the lower pole. This is repeated until three successive end-inspirations bring the lower pole of the kidney directly under the pointer each time.

This site is then infiltrated with a local anesthetic after surgical cleansing and draping. A No. 20 gauge spinal needle is then inserted as an exploring needle as well as for further anesthesia of the deeper tissues. As the operator advances the needle to a point within range of the kidney, the fluoroscopist examines the relationship of needle tip to kidney. If, on respiration, the lower pole of the kidney moves independently under the tip of the needle, then the needle is still superficial to the renal parenchyma. The needle is then advanced slightly and another fluoroscopic check is made. In this way, the exploring needle can be accurately placed in the lateral aspect of the lower pole, specifically avoiding calyces, pelvis, and areas of larger vessels. When the tip of the needle moves in unison with the desired segment of kidney, satisfactory placement has been accomplished.

The spinal needle is then removed, the kidney depth noted, and the same procedure is repeated through a small slit incision at the skin site to allow for the larger biopsy needle. Unlike the exploring needle, the Franklin needle transmits a definite sensation to the operator upon penetrating the kid-

From the departments of medicine and radiology, US Army General Hospital, Frankfurt/Main, Germany. MAJ Haddad is presently with the US Army Hospital, Fort Huachuca, Ariz. MAJ Mani is presently with the University of California Medical Center, San Francisco.

ney capsule. As before, the fluoroscopist aids in the positioning of the needle and uses the television monitor for frequent checks of the kidney and needle movements. After satisfactory placement of the Franklin needle, the biopsy is obtained in the standard manner.

Following the biopsy, a pressure dressing is applied and the fluoroscopist makes a final check for possible complications, particularly extravasation of the contrast medium. Vital signs are observed and the patient is returned to the ward.

Results

Percutaneous renal biopsies were performed in 23 patients by this method and adequate renal tissue was obtained in 22 (96 percent). The one failure occurred early in our series in an obese patient with a contracted and very mobile kidney. A repeat attempt resulted in pancreatic tissue being obtained. It is felt that the needle had probably gone through the kidney.

Of the 22 patients in which renal tissue was obtained, two patients required two attempts. In one case, the Franklin needle was found to be defective. In the other, an obese patient, the needle was too short and the biopsy was easily obtained when a longer Vim-Franklin needle became available to us.

There were no serious complications. Several patients complained of mild back pain which was relieved by simple analgesics. Microscopic hematuria was common to all. Only one patient had gross hematuria and renal colic, which resolved spontaneously within 48 hours. No blood transfusion was required.

Special Technical Considerations

As our experience with this procedure has increased, we have found that certain technical aspects should be stressed.

Contrast Dose.—Opacification of the entire renal parenchyma is vital to correct placement of the biopsy needle. High-dose infusion pyelography is far superior to the conventional low-dose technique in producing high renal contrast. This is especially valuable in obese patients.

Consistent End-Inspiration.—Since the depth of respiration determines the range of kidney movement, the cooperation of the patient must be maintained. Extra time spent in "dry runs" with the patient have resulted in a consistent positioning of the kidney on end-inspiration with a consequent ease of biopsy.

Perpendicular Needle Position.—We have found

that small directional errors in the early advancement of the needle, i.e., away from the perpendicular, have resulted in a needle tip which is several centimeters off target. We have overcome this difficulty by stationing the radiologist at the foot of the table where he can inform the operator of any deviations from the perpendicular.

Needle Depth.—All operators seem to have a tendency to advance the biopsy needle deeper than the exploring needle, raising the problem of going completely through the kidney. To compound this difficulty, the fluoroscopic picture does not demonstrate changes in depth once the needle is imbedded in renal tissue. Hence, extra precautions must be taken, viz, strict attention to the original depth found by the exploring needle, advancement of the needle by small increments when approaching this depth, and frequent fluoroscopic checks to note the first sign of fixation of the needle tip in kidney.

Respiratory Needle Swing.—The characteristic respiratory swing of the needle does not necessarily indicate accurate or satisfactory placement of the needle tip in renal tissue. We have found that a good swing can occur with the tip in either lumbar or periphrenic tissue; this same swing may be seen if the needle has been advanced too far and is actually through the kidney. Conversely, a poor swing may be equally meaningless because of a short needle or greater kidney depth, as in an obese patient. The only assurance of proper placement is by careful approach to kidney depth and close observation of the first sign of needle fixation in renal tissue followed by a "bending" of the needle as the needle tip and kidney move in unison with respiration.

Needle Length.—Kidney depth varies considerably and sometimes surprisingly in patients of normal size, even more so in obese patients. Since the Franklin needle requires at least 4 to 5 cm of the shaft to be exposed for an effective biopsy maneuver, longer spinal and biopsy needles should always be available.

Comment

The reluctance to perform percutaneous renal biopsies stems from the nature of the procedure, that is, it requires an intrepid operator to insert a large bore needle into the flank and, without seeing the structures penetrated, biopsy an organ, which, hopefully, is the kidney. Of greater concern is the site within the kidney which is biopsied, since pelvicalyceal structures are prone to severe bleeding when punctured. Larger vessels near the medial

surface or hilus of the kidney can be inadvertently biopsied. Our own experience in performing renal biopsies under direct television monitoring has enforced our realization that very slight directional errors of the biopsy needle produce large divergences at kidney depth. Because of these difficulties, numerous modifications of the original "blind" technique have been described in attempts to better localize the kidney.

The use of fluoroscopy as an adjunct to percutaneous renal biopsy was first reported in 1956 by Lusted et al and again in 1962 but apparently gained little acceptance. This can be attributed to the poor image discrimination offered by conventional fluoroscopy as well as to the poor opacification produced by single dose pyelography. Additional factors were the inconvenience of transporting the patient to the x-ray department and the requirement of an attending radiologist.

Visual control of percutaneous renal biopsy requires first, a more effective system for visualizing the opacified renal parenchyma. The advent of image intensification with television monitoring allows the operator to see his target organ, the biopsy needle as it is advanced and the relationship between the two which is so necessary for accurate placement. Mertz et al recently reported the use of television monitoring in 33 successful biopsies. The second requirement of effective biopsy of the kidney is a better method for opacification of this organ than has hitherto been available. Schenker in 1962 popularized the intravenous infusion technique using relatively high dosage. This has allowed us to visualize small kidneys, even in very obese patients, without difficulty. The use of both of these technical improvements was reported recently by Kark and Buenger.

We feel that the disadvantages of transporting the patient and requiring an attending radiologist are minor when compared to the obvious advantages of the present method. What was often a lengthy procedure now requires from 15 to 45 minutes in our

hands. The objection of radiation exposure may be raised. Since the field size is limited to the inferior pole of one kidney and overall fluoroscopic exposure time is under 90 seconds, the exposure dose as calculated on our equipment is far less than that for an upper gastrointestinal series and certainly less than three roentgens to the exposed area.

We should like to emphasize that this technique allows anyone familiar with the Franklin needle to obtain renal biopsies. Our 23 biopsies were done by seven different internists, two of whom had never before attempted renal biopsy. The other five had all had variable luck using the "blind" technique. Although our series is small in number, the minimal morbidity in our group as compared to previous reports attests to the ease and safety to the procedure.

Summary

An improved method of percutaneous renal biopsy using television monitoring and high-dose infusion pyelography is described. Television monitoring allows the operator to visualize the opacified kidney and accurately place the biopsy needle. High-dose infusion pyelography affords renal opacification far superior to that produced by the conventional low dose technique. With this method, adequate renal tissue was obtained in 22 of 23 patients (96 percent) without significant complications. These biopsies were performed by seven different internists, two previously inexperienced in this procedure. The minimal morbidity in this series attests to the safety of the method. Special technical aspects of the procedure are included in this report.

Generic and Trade Names of Drugs

Secobarbital—*Seconal*.

Sodium diatrizoate—*Hypaque Sodium*.

(The omitted figures and references may be seen in the original article.)

ACUTE GLOMERULONEPHRITIS IN MIDDLE-AGED AND ELDERLY PATIENTS

H. A. Lee* MB B.Sc MRCP, G. Stirling† MD M. C. PATH, P. Sharpstone‡ MB MRCP, *Brit Med J* 2(5526):1361-1363, December 3, 1966.

Acute glomerulonephritis is an uncommon disease in the middle-aged and elderly. Of the 173 cases investigated by Ellis (1942) only three were over 50 and none was over 60; and Fishberg (1954) reported only once seeing a patient older than 60. While acute glomerulonephritis may pursue a malignant course—with death from oliguric renal failure in the acute phase, at any age—older patients seem particularly prone to this severe variant of the disease. Further, in this age group the presenting features often differ from those commonly seen in younger patients (Samiy, Field, and Merrill, 1961).

It is for these reasons that we report the clinical and pathological features of the seven patients aged over 50 seen at the renal unit of King's College Hospital in a three-year period from 1962 to 1965. They were all referred from other hospitals because of renal failure severe enough to warrant consideration of haemodialysis. During this time no younger patient with this disease required haemodialysis at this unit.

Clinical and Pathological Features

Table 1 summarizes the main clinical features of the patients, whose ages ranged from 53 to 78.

The commonest presenting symptoms were non-specific and included anorexia, nausea, vomiting, and diarrhoea. In only two patients was the onset of the illness preceded by a sore throat, and they both had high antistreptolysin-O (A.S.O.) titres. In two of the other three patients in whom the test was carried out the A.S.O. titre was 200 units or above. In no case were streptococci cultured from throat swabs. Three patients had non-dependent oedema, only two had hypertension, and macroscopic haematuria featured at some stage of the illness in five cases. Most of the patients were aware of a reduction in urine volume before admis-

sion, and anuria supervened in five of them in the terminal stages.

The initial clinical diagnoses were correct in only three patients. Obstruction of the renal tract, renal vascular accident, and exacerbation of chronic renal failure were the most frequently considered alternatives, and retrograde pyelography was carried out in five of the patients.

Treatment was with an acute oliguric renal failure regimen, and anabolic steroids were given to all. Hyperkalaemia was treated, when necessary, with oral or rectal Resonium-A. Haemodialysis with the Kolff twin-coil artificial kidney was carried out on four of the patients on one or two occasions. Only one (Case 1) received corticosteroids. Percutaneous renal biopsy specimens were obtained with the Menghini needle in four patients.

All seven patients died from anuric or oliguric renal failure, or its complications, 15 days to 17 weeks after the onset of the illness.

Details of the renal histology are presented in Table II. In no case was there any disease with which a glomerulitis may be associated, such as polyarteritis nodosa, systemic lupus erythematosus, or subacute bacterial endocarditis.

Discussion

Samiy *et al.* (1961) have drawn attention to the unusual features of acute glomerulonephritis in older patients, and this has been our experience too. Only two patients had a typical presentation with a sore throat followed by haematuria, oedema, and hypertension, permitting a fairly confident clinical diagnosis of acute glomerulonephritis to be made. In the others the presenting symptoms gave no clue to the cause of the acute renal failure. Because of anuria, obstruction of the urinary tract was suspected in five of the patients, and retrograde pyelography was performed.

Although fatal anuric glomerulonephritis may occur at any time of life (Berlyne and Baker, 1964; Harrison, Loughridge, and Milne, 1964), the age

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TABLE I.—Clinical Features of 7 Patients with Acute Glomerulonephritis

Case No.	Sex and Age	Sore Throat	A.S.O. Titre (units/ml.)	Macroscopic Haematuria	B.P. on Admission	Non-dependent Oedema	Granular Casts in Urine	24-hr. Urine vol. after Admission (ml.)	Haemodialysis	Initial Clinical Diagnosis	Duration of Disease and Outcome	Source of Histological Material
1	M 53	0	—	0	130/80	+	+	0-100	2	Acute renal failure? cause	Died in 6 weeks	P.M.
2	F 64	0	—	+	140/80	0	-	0	1	Idiopathic retro-peritoneal fibrosis	Died in 15 days	Operation biopsy and P.M.
3	F 55	+	780	+	200/110	+	+	300-600	0	Acute glomerulonephritis	" " 17 weeks	P.M.
4	M 59	+	700	+	200/100	0	-	0	0	" "	" " 12 "	Biopsy & P.M.
5	F 78	0	200	0	150/60	0	-	0	0	Acute abdominal catastrophe	" " 16 "	P.M.
6	F 72	0	200	+	140/70	0	+	0	2	Chronic pyelonephritis	" " 6 "	Biopsy
7	F 55	0	>50-<200	+	140/80	+	-	0	1	? Acute glomerulonephritis	" " 5 "	" & P.M.

- = Test not performed

range of our patients emphasizes the predilection for the older age groups of this form of the disease. Other reports confirm this. In a post-mortem study by Nesson and Robbins (1960) of 23 patients who died of acute glomerulonephritis 12 were aged over 50. In Berlyne and Baker's (1964) report of eight patients with fatal glomerulonephritis two were over 50, and no patient older than 40 survived in the series of patients of Harrison *et al.* (1964) with oliguric acute glomerulonephritis. Samiy *et al.* (1961) described seven cases of patients aged over 60 with acute glomerulonephritis, and three of them died.

There appear to be three types of histological lesion accompanying the clinical picture seen in our patients: (1) a predominantly proliferative and exudative lesion, which is regarded as characteristic of a post-streptococcal glomerulonephritis; (2) a predominantly capsular lesion, a capsulitis (Berlyne and Baker, 1964); and (3) fibrinoid necro-

sis which either partially or totally involves the glomerulus. The latter two types of renal lesion may follow a streptococcal infection but more commonly are found in those acute-glomerulonephritis patients without evidence of such an infection. Some cases present histological appearances which comprise features of all three main types.

Jennings and Earle (1961) have described the "typical" lesion in post-streptococcal glomerulonephritis as a lesion confined to the glomerular tufts and consisting of endothelial proliferation and glomerular exudate. Two of our cases (Nos. 3 and 4) with good evidence of a recent streptococcal infection showed this typical lesion.

The capsular lesion, which is particularly associated with severe oliguria or anuria, was well shown in Cases 5 and 6, where marked capsular epithelial proliferation resulted in compression or obliteration of glomeruli and even extended down the tubules. This lesion differs from the usual

TABLE II.—Details of Renal Histology in 7 Patients with Fatal Acute Glomerulonephritis

Case No.	Material	Type of Lesion	Glomerulus	Capsule	Tubules	Interstitial Tissue
1	Necropsy	Proliferative glomerulonephritis	Epithelial and endothelial proliferation. Leucocytic infiltrate	—	Epithelial degeneration. Casts and red blood cells	Cellular infiltrate
2	Biopsy (Fig. 1)*	Necrotizing glomerulonephritis	Fibrinoid necrosis and cellular proliferation. Swollen necrotic glomeruli joined to form giant structures	Necrosis	Epithelial degeneration and necrosis. Numerous red blood cells. Casts	Oedema. Cellular infiltrate
3	Necropsy (Fig. 2)	Proliferative glomerulonephritis	Endothelial proliferation. Leucocytic infiltrate	—	Red blood cells and casts	Cellular infiltrate
4	"	"	"	Occasional crescent	" " " " "	" "
5	Biopsy	Glomerulonephritis in which the predominant lesion is capsular	Compressed atrophied glomeruli	Proliferation of capsular epithelium	Epithelial degeneration. Haemorrhage and casts	" "
6	" (Fig. 3)	"	"	Proliferation of capsular epithelium extending into the first part of the tubule	" " "	" "
7	"	Necrotizing glomerulonephritis	Necrosis of glomeruli	Necrosis	Epithelial degeneration and necrosis. Red blood cells and casts	Marked cellular infiltrate

*All biopsy specimens contained at least 11 glomeruli; in every case all glomeruli were involved.

crescent formation in progressive type I glomerulonephritis in that there is complete obliteration of Bowman's space and compression of the vascular tuft. This capsulitis may result from altered immune responses or hypersensitivity reactions, which may involve any part of the nephron basement membrane (Berlyne and Baker, 1964) and is not confined to any particular age group.

The third type of histological change represented by fibrinoid necrosis was found in Cases 2 and 7. The presence of extensive areas of fibrinoid necrosis in the glomeruli indicates a poor prognosis, which is invariably fatal when coupled with capsular epithelial proliferation (Brun, Gormsen, Hilden, Iversen, and Raaschou, 1958; Allwall, Erlanson, Törnberg, Fajers, and Moëll, 1958; Berlyne and Baker, 1964; Harrison *et al.*, 1964). Nine fatal adult cases with necrotizing glomerulitis as the main feature of their acute oliguric glomerulonephritis were reported by Bialestock and Tange (1959). Hypertension did not play any part in the causation of the glomerular necrosis in our patients, their blood-pressure remaining normal, or very nearly so, throughout their illness. Indeed, there was no correlation between the degree of glomerular damage and the presence or absence of a diastolic hypertension in our cases, a finding similar to that of Berlyne and Baker (1964). In a larger series Jennings and Earle (1961) found that diastolic hypertension was more common among patients with severe glomerular damage but commented that there were notable exceptions.

The combination of a marked capsulitis with severe fibrinoid necrosis of the glomerular tuft not only makes recovery impossible but even precludes the onset of a partial diuresis. However, a partial diuresis is possible in the presence of severe endothelial proliferation even with focal areas of fibrinoid necrosis, although the eventual outcome is fatal.

Severe glomerular damage was usually accompanied by tubular damage, and both our examples of necrotizing glomerulitis (Cases 2 and 7) have marked proximal tubular destruction. Similar appearances occur in hypersensitivity nephritis, where any part of the nephron basement membrane may be affected, as seen in drug-sensitivity nephritis (Baker and Williams, 1963; Lee and Holden, 1964). All cases showed tubules packed with red cells suggestive of frank haemorrhage, yet red cells were seldom seen in Bowman's space. Hyaline casts featured in all cases, including the definite post-streptococcal ones, where their presence is uncommon (Jennings and Earle, 1961). A generalized or focal

cellular infiltrate was present in all cases and included numerous eosinophils in Case 1.

Percutaneous renal biopsy material was obtained in four patients. Since the renal changes in glomerulonephritis are thought to be uniform, this technique allows for a representative sample of tissue to be examined for diagnostic and prognostic purposes. In this, as in other series, there has been a good correlation between clinical and histopathological findings, and biopsy findings have all been confirmed by subsequent post-mortem studies. Repeated, unavailing dialysis can thus be avoided in patients where recovery of renal function cannot be expected.

Prolonged oliguria or anuria in acute glomerulonephritis carries an extremely grave prognosis, particularly in the adult (Merrill, 1957), but recovery has occasionally been reported (Persoff, 1965; Nakamoto, Dunea, Kolff, and McCormack, 1965). The renal lesions in those cases that have recovered have been far less severe than reported here or elsewhere (Berlyne and Baker, 1964; Harrison *et al.*, 1964). It has been suggested that the typical post-streptococcal type of renal lesion in association with a raised A.S.O. titre warrants persevering with dialysis treatment, but even here the longest period of oliguria with survival was 30 days (Nakamoto *et al.*, 1965). In the absence of a renal biopsy showing features known to preclude recovery of renal function, it seems reasonable to maintain patients with acute oliguric glomerulonephritis by repeated dialysis for at least six weeks and so allow time for a possible spontaneous recovery (*Lancet*, 1964).

The role of steroids in the management of acute oliguric glomerulonephritis is far from clear. They were found ineffective in eight cases of acute anuric glomerulonephritis (Berlyne and Baker, 1964), as in our only case where used, while elsewhere it has been suggested that they help to promote a diuresis (Nakamoto *et al.*, 1965). However, the two groups of patients were not comparable, having widely differing renal histology. The use of steroids in this situation must remain an open question.

Summary

Seven patients with fatal acute glomerulonephritis referred to a haemodialysis unit in a three-year period were between 53 and 78 years of age. The presenting features and natural history of acute glomerulonephritis in this age group often differ from those commonly seen in younger patients. The rarity of the disease in the middle-aged and

elderly, coupled with the atypical presentation of most of the patients, made the clinical diagnosis difficult.

The histological changes included necrosis of glomerular tufts, obliteration of Bowman's space by proliferation of the capsular epithelium, and endothelial proliferation with glomerular exudate. Renal biopsy is valuable in both establishing the diagnosis and assessing the severity of the disease,

and so avoiding submission of patients with no hope of recovery to unnecessary treatment.

We are grateful to Professor J. Anderson for permission to report these cases, and to Professor H. A. Magnus for his advice. The photomicrographs were prepared by Mr. George Harwood.

(The references may be seen in the original article.)

RECURRENCE AND MORTALITY RATES IN SIGMOID VOLVULUS

James R. Hines MD FACS, Robert E. Geurkink MD FACS, and Robert T. Bass MD, Chicago, Illinois. Surg Gynec Obstet 124(3):567-570, March 1967.

While sigmoid volvulus is second to carcinoma as a cause of colon obstruction, very little has been published describing either the natural history of the disease or the results of long term follow-up studies. This investigation was undertaken to report a long term study in an unselected group of patients with sigmoid volvulus. The various methods of treatment are assessed in an attempt to clarify the indications for sigmoid resection.

Materials and Methods

The 45 patients in this study represent all the documented instances of sigmoid volvulus from the Cook County and the Chicago Wesley Memorial Hospitals for the period of January 1960 to August 1965. There were 28 males and 17 females whose ages ranged from 31 to 92 years, the average age being 66 years. Twenty-two patients had severe mental or neurologic deficiencies, and many were admitted from nursing homes or psychiatric units. After discharge, all 45 patients were followed up to the time of either recurrence, sigmoid resection, or death. If an autopsy had not been carried out, detailed descriptions of the symptoms and findings were obtained to establish the probable cause of death.

Clinical Findings

All 45 patients had obstipation and distention. Thirty-three patients had a history of severe chronic constipation and 22 neurologic or psychiatric de-

ficiencies. Seventeen patients had experienced pain, 11 vomiting, and 10 melena and weight loss. A review of the Roentgenographic examination of the abdomen revealed that the correct diagnosis could have been made from the x-ray films alone in 42 of the 45 patients. A Y sign formed by the adjacent thickened walls of the colon was present in most patients. Barium enema was diagnostic in the 14 patients upon whom it was used. Diagnosis was confirmed by proctoscopic examination in 25 patients and by laparotomy in 8. Four patients had proved necrosis of the colon. The only concomitant intestinal disease found was in 3 patients with diverticulosis.

Methods of Early Reduction

Reduction by proctoscopy and a well lubricated, long rectal tube was successful in 29 of 37 attempts. In 11 patients, reduction was carried out at laparotomy. The reasons for the laparotomy were suspected intestinal necrosis in 4, uncertainty in diagnosis in 4 and after suspected perforation in 3. Fourteen patients were given barium enemas prior to reduction, and in 6 of these patients, the volvulus was reduced by the column of barium. In 6 patients, reduction was spontaneous. Two patients died with unreduced volvulus. The total of 52 early reductions was obtained by adding 9 early recurrences to the original 43 reductions.

Recurrence Rate

Recurrences followed every method of reduction, the time interval varying from a few days to 5 years.

From the Department of Surgery, Northwestern University Medical School, Chicago.

By permission of Surgery, Gynecology & Obstetrics.

Fourteen patients were eliminated from the possibility of recurrence as 8 died within a few days of reduction and 6 others underwent sigmoid resection during this period. In the remaining 31 patients, it was found that there were recurrences in 19 of 21 after reduction by proctoscopy, in 4 of 4 after reduction by barium enema, in 4 of 4 after spontaneous reductions, and in 1 of 2 after operative detorsion.

In 3 patients, the condition did not recur. Two died of unrelated causes within a year, and 1 patient is alive without recurrence 18 months after operative detorsion. Of the total 31 patients, the condition recurred in 28, a recurrence rate of 90 percent. In these 31 patients, 100 episodes of volvulus occurred, an average of 3.2 episodes per patient.

Results in Conservative Therapy

Thirteen patients were discharged from the hospital after simple reduction of the volvulus. Conservative therapy revolved about two main issues: serious concomitant illnesses or a reluctance on the part of the patient or family to allow elective sigmoid resection. Two of these patients were readmitted with volvulus and 1 of them died. Five died at home or in nursing homes with recurrent volvulus, the deaths occurring 3, 8, and 9 months and 2 and 5 years after the original episode. Five other patients died at home of unknown or unrelated illnesses, all within 1 year of discharge. Three of these died of known diseases, but the cause of death remained obscure in the other 2. The thirteenth patient is alive 18 months after operative detorsion. A bottleful of phosphosoda is required every other day for constipation, but the patient is otherwise well.

It is apparent that conservative treatment in this group of patients yielded poor results.

Results in Elective Resection

Twenty-one patients underwent elective sigmoid resection. In 3 of these, postoperative intestinal obstructions developed, reoperation being necessary in 2. All 3 survived and were discharged within 1 month. Three deaths occurred after sigmoid resection. One patient had a cardiac arrest and died on the fourth postoperative day. In 1 patient, a myocardial infarction developed a week after discharge, and he died on readmission. The third fatality occurred in a patient who recovered from sigmoid resection but who died after re-resection

and ileoproctostomy for megacolon. Of the 19 patients who underwent simple sigmoid resection with end-to-end anastomosis, 18 survived, the sole death being the patient with cardiac arrest.

Causes of Death and Mortality Rate

Ten patients died during the first hospitalization, a mortality rate of 22 percent. One of these patients was moribund on admission and died on the way from the emergency room to the ward. Another patient died 48 hours after unsuccessful proctoscopy and reduction by barium enema, probably of perforation or colon necrosis. A third patient died 3 weeks after reduction with recurrent volvulus, complicated by pneumonia and delirium tremens. Eleven patients underwent an emergency operation and 5 died, all within 10 hours. While only 3 of these patients had a necrotic colon, septic shock probably played a role in the deaths of all 5 patients. Two patients died after elective resection during the first hospitalization, 1 due to the cardiac arrest and 1 after the ileoproctostomy already described.

Three patients died after readmission, advancing the overall mortality rate to 29 percent. One was the previously described patient who had a myocardial infarction. The other 2 deaths followed multiple reductions by proctoscopy and long rectal tubes. One of these patients had undergone 4 reductions and 1 had undergone 5; both deaths probably resulted from sigmoid perforation.

Five patients died at home with recurrent volvulus. This brought the total number of deaths due to the disease to 18, a mortality rate of 40 percent.

Discussion

The recurrence rates in sigmoid volvulus are difficult to evaluate in the surgical literature. In most articles, the rate is that of the primary hospitalization or of rehospitalization in the same institution. Bruusgaard noted that 31 of 60 patients were readmitted with the same disease. Wuepper and his associates stated that in 8 of 16 patients in whom resection was not carried out the condition recurred during the first admission. Drapnas and Stewart reported 2.5 episodes of volvulus per patient but did not deal with the recurrence rate. In most series, the recurrence rate was estimated to be 20 to 60 percent. In our series, there were 28 recurrences in 31 patients, a rate of 90 percent.

The mortality rates of sigmoid volvulus reported in the literature also require careful evaluation. In some series, the mortality rate is related only to the primary hospitalization. In other studies, the mor-

tality rates are given per episode of volvulus and not per individual patient. In many series, the deaths from concomitant disease are eliminated. In general, the reports varied from 14 to 42 percent. Bruusgaard reported 14 percent in 91 patients; Ingalls and his associates, 22 percent in 19; Shapiro and Mason, 20 percent in 21; Griffen and his associates, 40 percent in 23; Wuepper and his associates, 31 percent in 39; Hinshaw and Carter, 42 percent in 55; and Buxton, 14 percent in 24. In compiling 600 unselected patients from the literature, it was found that the average hospital mortality rate was slightly more than 25 percent. In our series, the mortality rate increased from 22 percent on the first hospitalization to 40 percent when the patients were followed up for a long period.

Several generalizations regarding treatment of this disease were noted. The presence of necrotic colon is difficult to determine on physical examination alone, and any method of reduction which does not allow visualization of the colon, such as barium enema, is hazardous. After reduction from below, the rectal tube should be left in place for 5 or 6 days to prevent early recurrence. In the group of 8 patients who underwent unsuccessful reduction by proctoscopy, there were 5 deaths, and it is likely that immediate laparotomy would have reduced the mortality rate in this group. During emergency laparotomy, the best results were obtained by carefully untwisting the viable intestine over a long rectal tube. At elective resection, primary end-to-end anastomosis gave the best results. Any form of obstructive resection or colostomy did poorly in this series. Close observation for septic shock should be made after any method of reduction.

Suggested Outline of Treatment

Reduction from below should be carried out unless intestinal necrosis or perforation is suspected. The twisted area is visualized, and a long tube inserted beyond the obstruction and taped in place for 5 or 6 days.

Emergency laparotomy is indicated when the intestine appears dark or necrotic at proctoscopy, when reduction from below is not successful, or when physical examination suggests necrosis. Viable intestine should be carefully untwisted over a long rectal tube inserted from below. Necrotic intestine should be resected, and end-to-end anastomosis carried out.

Elective sigmoid resection with reconstruction by primary end-to-end anastomosis should be carried out as soon as possible after any method of reduction.

Summary

Forty-five patients with sigmoid volvulus were followed up for several years. From the practical standpoint, the recurrence rate was 90 percent and these recurrences followed every form of reduction. The mortality rate was 22 percent on the first admission but rose to 40 percent when readmissions and deaths at home were added.

It is apparent that this is an unrelenting and deadly disease. In this series, sigmoid resection was the only treatment which prevented recurrences or death.

(The figures and references may be seen in the original article.)

MEDICAL ABSTRACTS

SURGICAL TREATMENT OF PULMONARY METASTASES FROM PRIMARY TUMOURS OF BONE

Rodney Sweetnam and Keith Ross, (From the Middlesex Hospital, London.) *J Bone Joint Surg (Brit)* 49-B: 74-79, Feb 1967.

A series of 12 patients with solitary lung metastases from primary tumours of bone is reviewed in this article. Seven of the tumours were osteosarcomas, two chondrosarcomas, two fibrosarcomas, and

one was a malignant chondroblastoma. The metastatic lesion was resected in each instance. Four of the patients died after the resections, at the following intervals: 2 years 3 months, 2 years, 1 year 3 months, 7 months (one died after 7 years 3 months of unrelated cause, no evidence of malignancy at autopsy). The average survival of the others after pulmonary resection is 6 years 7 months. The authors suggest that the results of pulmonary resection in carefully selected patients with solitary pulmonary metastases fully justify the procedure but recom-

mend careful investigation to ensure as far as possible that the metastasis is solitary and a "waiting period" (three months) in case others should develop, to avoid unnecessary surgery.

EVALUATION OF A PROGRAMMED TEXT IN SIX MEDICAL SCHOOLS

P. L. Wilds MD and Virginia Zachert PhD, (Medical College of Georgia, Augusta, Georgia.) J Med Educ 42: 219-224, Mar 1967.

The Medical College of Georgia undertook this study to determine whether or not programmed instruction could be used to improve the teaching of patient management to students in their junior year of medical school. The subject matter selected for the project was gynecologic oncology: the detection, diagnosis, and treatment of benign and malignant tumors of the female genitalia. An 830-frame linear programmed text covering the material traditionally included in the lectures on gynecologic oncology was developed. The content of this text and that of lectures which were given to control groups of junior medical students at the Medical College of Georgia in 1963-64 was essentially the same. In the academic year 1964-65, five other Medical Schools (California College of Medicine, State University of Iowa College of Medicine, University of Nebraska College of Medicine, University of North Carolina School of Medicine, University of Vermont College of Medicine) participated in a replication of this study.

In the conclusion of this evaluation, the authors state that if the measurements used in the experiment are acceptable as criteria of teaching effectiveness, the programmed text may be considered a successful replacement for conventional teaching of gynecologic oncology in six medical schools.

(See Nurse Corps Section of the News Letter 49(4):23-24, February 24, 1967—Editor.)

ESOPHAGEAL PERFORATIONS

W. J. Hardin MD, J. D. Hardy MD FACS, and J. H. Conn MD FACS, (From the University and Veterans Hospitals and the Department of Surgery, University of Mississippi Medical Center, Jackson, Mississippi.) Surg Gynec Obstet 124: 325-331, Feb 1967.

In the introduction, the authors refer to the "considerable controversy" in recent years on the

subject of management of esophageal injuries, especially with the advent of newer surgical techniques and antimicrobial agents. They report experience with 20 patients with esophageal perforations. They concur in the almost universal agreement that spontaneous ruptures should be treated by immediate thoracotomy and that externally penetrating injuries should also be handled by immediate operation. However, they feel that iatrogenic instrumental cervical esophageal perforations can be observed under rigid conservative therapy safely unless there is definite evidence of a large tear. In the latter instances, the tear should be closed primarily and the wound drained. When nonoperative management is initiated, the patient must be observed closely and the physician must be prepared to operate if excessive fever, pain, or signs of shock appear. Thoracic esophageal perforations more commonly require immediate or early operation since mediastinal and pleural contamination will develop in a significant proportion.

The nature of the primary esophageal disease plays an important role in determining the type of therapy instituted. There is little hope of closing a perforation of a grossly carcinomatous esophageal wall and thus either conservative care or simple closed thoracostomy tube drainage is usually indicated.

In all instances, intensive antibiotic therapy, intravenous fluids, and bed rest should be employed.

SUPPURATIVE LUNG DISEASES

T. L. Petty MD and R. S. Mitchell MD, (From the Webb-Waring Institute for Medical Research and the Department of Medicine, University of Colorado School of Medicine, Denver, Colorado.) Med Clin N Amer 51:529-540, Mar 1967.

In this article, the authors review the pathogenesis, clinical picture, and management of suppurative lung diseases commonly encountered today. Acute parenchymal suppuration, lung abscess with lobar pneumonia, lung abscess associated with bronchial obstruction or stenosis, metastatic lung abscess, nosocomial pulmonary suppuration, bronchial suppuration (bronchiectasis); and adult mucoviscidosis are discussed. In the summary, they state that the availability and early use of antimicrobial chemotherapy has drastically reduced the incidence of primary lung abscess and saccular bronchiectasis but necrotizing pneumonia, bronchial obstructive processes arising particularly from increasingly prev-

alent bronchogenic carcinoma, and lung abscess resulting from new modalities of medicine such as infected indwelling arteriovenous hemodialysis shunts, and nosocomial infections caused by inadequately sterilized inhalation therapy equipment continue to provide a number of cases of bronchopulmonary suppuration today.

COMPUTER ANALYSIS OF POSTCHOLECYSTECTOMY BILIARY TRACT SYMPTOMS

Bertil Bodvall MD and Björn Övergaard MD, (From the Department of Surgery II, University of Göteborg, Sahlgrenska Sjukhuset, Göteborg, Sweden.) Surg Gynec Obstet 124: 723-732, April 1967.

This investigation was designed to analyze the varying severity of postcholecystectomy distress in a large number of patients and to study factors which might influence such distress. A total of 1,930 patients (1,477 women and 453 men) were studied after they had cholecystectomy for gall stone disease. They comprised two groups of almost equal size, one observed five to nine years and the other two years following cholecystectomy. Choledocholithotomy had been performed in 10.8 percent of the entire follow-up series (7.8 percent of group I and 14.6 percent of group II). A significant difference between the two groups is the lower frequency of operative cholangiography in group I (14 percent vs. 65.9 percent) and to the lower frequency of common duct exploration in group I (15.2 percent vs. 39.4 percent). The primary mortality was approximately the same in the two groups, 1.7 percent. Patients with postcholecystectomy biliary distress, 39.6 percent, were divided according to the severity of their symptoms into the following categories: dyspepsia, 10.7 percent; attacks of mild pain, 23.5 percent; occasional attacks of severe pain, 3 percent; and severe postcholecystectomy biliary distress, 2.4 percent.

The follow-up series was analyzed in an electronic computer, factors possibly influencing the frequency of postcholecystectomy distress being studied by analyses of multiple variances. The following is the authors' summary:

"Group I patients with a long interval between cholecystectomy and follow-up had a significantly higher frequency of distress than group II patients

with a short interval. Postcholecystectomy distress appeared at any time following the operation.

"Women had a significantly higher frequency of postcholecystectomy distress than men.

"A decreasing frequency of distress with advancing age at cholecystectomy was found in both sexes, except in women 40 to 49 years old, who had the highest frequency, 53.5 percent, of all the age groups.

"Patients with cholecystolithiasis had a significantly higher frequency of postcholecystectomy distress than patients with mild to moderate cholecystitis and severe cholecystitis.

"The longer the preoperative history the higher was the frequency of postcholecystectomy distress.

"Sex, age, type of gallbladder disease, and length of precholecystectomy history were factors which independently of each other influenced the frequency of postcholecystectomy biliary distress.

"The later in the course of acute cholecystitis that cholecystectomy had been performed, the lower was the frequency of postcholecystectomy distress.

"Choledocholithotomized patients had a significantly lower frequency of postcholecystectomy distress than did those patients who had not undergone choledocholithotomy.

"Patients with a functioning gallbladder had a significantly higher frequency of postcholecystectomy distress than those with a nonfunctioning gallbladder.

"The size or the number of stones in the gallbladder did not influence the frequency of postcholecystectomy distress.

"Patients with acalculous, functioning gallbladder had a significantly higher frequency of postcholecystectomy distress than the group with stones in a functioning gallbladder.

"The gallbladder disease per se and not the presence of stone influenced the frequency of postcholecystectomy biliary distress.

"Patients with dyspepsia and attacks of mild pain considered themselves improved by the cholecystectomy and constituted 34.2 percent of the entire series. Patients with occasional attacks of severe pain, 3 percent, did not present any major therapeutic problems; however, the reverse applied in the remaining 2.4 percent with disabling symptoms of severe postcholecystectomy biliary distress."

DENTAL SECTION

METHODS OF ACHIEVING EFFECTIVE HYGIENE OF THE MOUTH

J. C. Derbyshire, *Dent Clin N Amer* 231-244,
March 1964.

This article discusses (1) the need for effective oral hygiene; (2) the purpose of oral hygiene; (3) why some patients fail or refuse to keep their mouths clean; (4) psychological aids to good oral hygiene; and (5) effective mechanical aids to oral hygiene.

Aside from its value as a preventive measure, the patient should need or desire good oral hygiene as an important part of good grooming. The dentist, therefore, must educate and convince the patient that he needs good oral hygiene and that there are advantages to good oral hygiene as a personal grooming aid. The purpose of oral hygiene, according to the author, is to remove from the oral cavity all accumulated or retained food particles, dental plaque, accretions, stains and desquamated cells. This, he says, reduces the build up of plaque and calculus and a concomitant reduction in caries incidence. There are two basic reasons why patients fail or refuse to keep their mouths clean; (1) due to lack of information by the patient and (2) due to lack of motivation. Patient education has been done by the dental profession primarily by the printed word. The patient education or teaching methods employed are not causing the desired response in the majority of the population.

Patient motivation studies by other authors are discussed, one author quoted by the article pointed out how to make a patient preventively oriented. This is done by making the patient believe he is *susceptible* to a particular dental problem, that he is being *affected* by this disease, that this disease will be *serious* for *him* and that there are *actions* which the patient can take *to prevent* or alleviate the serious effects of the problem. Barriers must be removed that prevent the patient from accepting his susceptibility to and the seriousness of periodontal disease. The article states that the dentist must inform the patient that there is a course of action that can be taken to prevent or alleviate the disease.

The author points out that a rather overwhelming mass of evidence shows that the bacterial plaque plays a most important role in the initiation of

periodontal disease and that the successful removal of this plaque is an extremely effective preventive measure. Methods by which the dentist presents these facts and, therefore, achieves action from the patient are suggested. The importance of accuracy and description in teaching the adult learner is discussed. The author equates oral hygiene with other hygienic procedures, relates oral hygiene and systemic health and discusses the role of the dentist in patient motivation.

The article concludes with a discussion of effective mechanical aids to oral hygiene. The role of disclosing solutions, hand and electric toothbrushes, oral lavage devices and other adjuvants to oral cleanliness is summarized. The author states that instruction in toothbrushing technique has not resulted in a patient practicing effective oral hygiene. Only after a patient has developed an inner urge or need to keep his mouth clean, will satisfactory results be evidenced. A patient, he states, will genuinely respond to the dentist's request for cooperation for his (the patient's) own reasons and needs. Cooperation depends on getting the patient's needs identical to the dentist's request.

The article establishes that most persons are susceptible to periodontal disease. Periodontal disease can be serious. Good oral hygiene methods will favorably modify or prevent the condition. How we achieve effective hygiene depends upon patient education and motivation as well as the proper use of mechanical aids.

(Abstracted by: CAPT P. F. Fedi DC USN.)

CAROTIDYNIA—A DISTINCT SYNDROME

Editorial, JAMA 199:121, January 9, 1967.

Carotidynia refers to pain arising from either or both extracranial carotid arteries. Dilation, distention, or displacement of a segment of the artery stimulates pain-sensitive receptors in the adventitia. The resulting pain not infrequently radiates from the neck to the ipsilateral side of the face and ear. At times, in fact, head and face discomfort may be the primary manifestation of carotidynia.

One variant of carotidynia shows a predilection for young adults. Unilateral neck pain of sharp,

stabbing, occasional throbbing quality occurs, aggravated by head movement, swallowing, chewing, coughing, yawning, and sneezing.

The diagnosis of carotidynia is established by gentle digital pressure on the involved carotid segment. This maneuver reproduces the pain pattern of the spontaneous attack. Treatment is supportive: reassurance, soft diet, and mild analgesics.

This syndrome should certainly be one consideration in the differential diagnosis of a temporomandibular joint syndrome.

(Abstracted by: LCDR William K. Bottomley DC USN.)

THE CONTIGUOUS AUTOGENOUS TRANSPLANT — ITS RATIONALE, INDICATIONS AND TECHNIQUE

*Ross, Malamed and Amsterdam, J Amer Soc Perio-
dont 4(5), Sept-Oct 1966.*

The contiguous autogenous transplant is a procedure for eliminating a one-wall infrabony pocket. Bone is not removed from the donor site and transplanted into another area, but is moved to an adjacent area contiguous with the donor site. With this technique, bone from an edentulous area or

septum is used to eliminate an infrabony defect in the recipient site.

In a conventional autogenous transplant, there is a complete fracture of the grafting substance. The contiguous autogenous transplant, however, is a "green stick" fracture — an incomplete fracture — which does not sever all of the functioning blood vessels. This procedure is helpful in maintaining the graft in place and utilizing the intact blood vessels at the base to act on the graft. The donor site heals normally with no defect present.

Photographs, drawings and roentgenograms are used of actual cases showing the application and success of this surgical procedure. The major advantages of this technique are:

1. Eliminating additional surgical trauma in distant or remote areas in gaining transplant material.
2. Negating possibility of refection of foreign homologous or heterologous tissues.
3. Retention of bone which would normally be sacrificed by osseous resection.

The authors realize that this procedure is limited in its application and that certain anatomical considerations preclude it from being used extensively.

(Abstracted by: CAPT P. C. Alexander DC USN.)

NURSE CORPS SECTION

TO ALL NAVY NURSE CORPS OFFICERS

As Surgeon General of the Navy, it gives me great pleasure on this 59th anniversary of the U.S. Navy Nurse Corps to extend my heartiest congratulations to every Navy nurse serving throughout the world.

Today, as in the past, you continue to provide dedicated service to our sick and injured. The added demands, responsibilities, and challenges brought about by our commitments to the defense of the free world have been met with the same enthusiasm and professional competence that has become the standard for the Navy nurse.

For myself, and on behalf of the Medical Department of the Navy—"Well Done" and a Happy Birthday!



R. B. BROWN
Vice Admiral MC USN
Surgeon General

GREETINGS TO NURSE CORPS OFFICERS

It is my privilege and honor to extend my greetings and warmest wishes to each one of you on the fifty-ninth anniversary of the Navy Nurse Corps.

As we rejoice in our celebrations, we should take time to reflect on the illustrious heritage of our Corps and pay tribute to all Nurse Corps officers who, since 1908, have met the challenge of their mission in peace and war by unsurpassed professional competency and devotion to duty.

The record of Navy nurses' accomplishments, heroism, and personal sacrifices during the present trying days of combat operations in Vietnam bears witness to our continued commitment to the fundamental responsibility of nursing—that of preserving life and promoting health.

I am proud of you today. I look to you to continue our tradition of excellence and to contribute newer and higher levels of nursing practice for all persons entrusted to our care. May yours be the joy and satisfaction that comes from a job "Well Done".



s/Veronica M. Bulshefski
Capt NC USN
Director, Navy Nurse Corps

NAVY NURSE CORPS CELEBRATES 59TH ANNIVERSARY

On Saturday, 13 May 1967 traditional anniversary celebrations were held around the world as the Navy Nurse Corps celebrated its 59th anniversary.

On 13 May 1908, President Theodore Roosevelt

signed the Naval Appropriation Bill which authorized the establishment of the Navy Nurse Corps as a staff corps of the Navy. Fifteen months later Esther V. Hasson was appointed the first Superintendent. By October, 1909, the first group of Navy nurses had reported to the Naval Hospital, Washington, D.C. for duty. These nurses are often referred to in Navy history as the "Sacred Twenty." From that time until the present Navy nurses have served with valor and distinction.

During World War I, four Navy nurses were awarded the Navy Cross for outstanding service, three posthumously.

During World War II, thirteen nurses were awarded Bronze Star Medals for meritorious achievement and service in the performance of duty; eleven received Gold Stars in lieu of a second Bronze Star Medal; seven received Commendation Ribbons for outstanding service in both European and Pacific theaters, and forty-two have unit Commendations for distinguished service aboard the SOLACE and at the Naval Hospital, Pear Harbor, at the time of the Japanese attack.

During the Korean Conflict three Navy nurses won the Bronze Star, one a Letter of Commendation with ribbon and Combat "V" while six received Letters of Commendation.

Navy nurses are continuing this fine tradition today in Vietnam. Two have been awarded the Vietnamese Medal of Honor, the Navy Commendation Medal and one Navy nurse has been awarded the Commendation for Achievement by the Secretary of the Navy.

Navy nurses are presently assigned to two hospital ships operating in Vietnam waters as well as to many other medical activities throughout the world.—Public Affairs Office, BuMed.

NAVY NURSES SCHEDULED FOR ASSIGNMENT IN VIETNAM

The Chief of Naval Operations has approved for the first time the assignment of women Navy Nurse Corps Officers to the Station Hospital, Naval Support Activity, DaNang.

At the present time the only nurse at the Station Hospital is a male anesthetist who has been in Vietnam since October 1966.

Construction of the Nurses' quarters has begun and it is expected they will be ready for occupancy when the first contingent of women Nurse Corps Officers arrive about 1 August.—Public Affairs Office, BuMed.

PREVENTIVE MEDICINE SECTION

EPIDEMIOLOGICAL TREATMENT OF VENEREAL DISEASES

Since the distribution of SECNAV Instruction 6222.1B on the "Repression of Prostitution and Control of Venereal Diseases", the Bureau of Medicine and Surgery has received several letters requesting clarification of Section 5 of that Instruction.

The sentence which has caused some confusion states, "Those reporting exposure to possible venereal disease shall receive adequate prophylactic treatment." Letters received have pointed out that BUMED Instruction 6222.3C discontinued the use of oral drug prophylaxis of venereal diseases and that consequently the two Instructions were mutually incompatible. Oral penicillin prophylaxis is still to be avoided.

What is meant by "prophylactic" treatment is really "epidemiologic" treatment. Section 1 of NAVMED P-5052-11A, "Treatment and Management of Venereal Disease" states "As a preventive measure against syphilis following sexual exposure with a known case of syphilis . . . 2,400,000 units of benzathine penicillin should be given intramuscularly immediately." Benzathine penicillin is *not* recommended as prophylaxis against gonococcal infections. The only chemoprophylaxis for gonococcal infection is a therapeutic dose of procaine penicillin: 2.4 million units for males or 4.8 million units for females.

The final decision as to whether a patient is to receive treatment, or prophylactic (epidemiologic) treatment, for any disease, including venereal disease must rest with the medical officer. Since an almost infinite number of possibilities exist in this regard, an instruction enumerating each specific presenting story would be voluminous and still not all inclusive. The clinical judgment of the attending medical officer must decide the course to be followed in each individual case.

(Tuberculosis and Venereal Diseases Control Section, PrevMedDiv, BuMed.)

CHANGE IS MADE TO TUBERCULOSIS CONTROL INSTRUCTION

BUMED Instruction 6224.1C of 8 July 1966 has required that all tuberculin convertors receive sputum cultures and gastric washing cultures.

A detailed study of recent skin test convertors at St. Albans Naval Hospital has shown that a significant percentage of X-ray negative individuals have positive cultures. The requirement for culturing convertors, except when the chest X-ray reveals a suspicious lesion, has therefore, been deleted. This change will be transmitted to all facilities shortly.

The importance of taking prophylactic isoniazid by convertors cannot be stressed too greatly. The success of the Tuberculosis Control Program rests on the continued use of isoniazid prophylaxis. It is the responsibility of every member of the Navy Medical Department to insure that every convertor continues to take isoniazid daily for one year.

(Tuberculosis and Venereal Diseases Control Section, PrevMed Div, BuMed.)

NEW TREATMENT REGIMENS FOR GONOCOCCAL URETHRITIS*

The worldwide emergence of strains of *N. gonorrhoeae* with decreased sensitivity to penicillin has been associated with a growing number of therapeutic failures when acute gonococcal urethritis in males has been treated with doses of penicillin previously considered adequate. In view of this experience, the U.S. Public Health Service and the U.S. Armed Forces, in the summer of 1965, recommended the use of a single intramuscular dose of 2.4 million units of aqueous procaine penicillin G for the initial treatment of male gonococcal urethritis rather than 1.2 million units.

Since the adoption of this treatment schedule, it has been apparent that an appreciable treatment failure rate in military personnel continues to exist throughout the Western Pacific and South East Asia. This failure rate has been between 20 and 30%. Studies were, therefore, performed to more closely assess the efficacy of this treatment in an area where penicillin resistant strains of *N. gonorrhoeae* are known to be common. A military population of approximately 8,500 men was utilized.

In the first group of 3,000 men, there were 119 cases of urethritis, 68 of which were gonococcal. These 68 men were treated with 2.4 million units

*This article is a summary of studies carried out by the U.S. Navy Preventive Medicine Unit No. 6, Honolulu, Hawaii.

of aqueous procaine penicillin with a 30% treatment failure rate.

In the second group of 5,500 men, there were 194 cases of urethritis of which 88 were gonococcal. Probenecid and penicillin were administered to 58 patients with gonococcal infection. One gram of probenecid was given orally one hour prior to the injection of 2.4 million units of aqueous procaine penicillin and 0.5 gms of probenecid was given at 6, 12, and 18 hours after the injection. Only one treatment failure occurred in this group. Tetracycline was administered to the remaining 30 patients with gonococcal infection, in an oral dosage of 1.5 gms initially, followed by 500 mg every 6 hours for 16 doses. No failures occurred.

Additional study of the tetracycline treatment schedule has resulted in decreasing the number of doses after the initial dose from 16 to 4.

The treatment regimens found to be of greatest value are, therefore:

a. 2.4 million units of aqueous procaine penicillin I M in one dose (divided into both buttocks) with 1 gm of probenecid *per os* given one hour prior to penicillin injection and then 0.5 gms probenecid q 6h x 3.

b. 1.5 gms tetracycline *per os* initially and 0.5 gms q 6h x 4 doses.

It is requested that any medical officers using either or both of these treatment schedules in a significant number of cases report their results to the Bureau of Medicine and Surgery (Code 72).

RESEARCH IN FOOD POISONING

USDHEW PHS Release of 28 Jun 1966.

The Public Health Service, U.S. Department of Health, Education, and Welfare announced that a 5-year \$900,000 grant for research in food poisoning has been awarded to the Iowa State University of Science and Technology at Ames, Iowa. It is the largest single grant yet made for studies into foodborne illness by the US PHS Division of Environmental Engineering and Food Protection. Foodborne illness is a major public health hazard in the United States, affecting an estimated 1 million persons each year.

Dr. John C. Ayers, Project Program Director, said the study could lead to improvements in the safe and sanitary processing of foods, and especially would assess recent innovations in food processing methods which result in changes of microbial flora in market foods.

Additional objectives of these studies are the

development of new information in the complete food production chain, beginning at the farm, during transportation, in the processing plant, and in the final product. Research efforts will investigate the pseudomonads, staphylococci, enterococci, lactics, corneforms, clostridia, salmonellae and other enterics, molds and yeasts found in food. Study will also be made of the impact of differing animal feeds, transporting vehicles, processing operations, equipment and personnel.

Dr. Ayers is Professor of Food Technology in Iowa State University's Department of Dairy and Food Industry. He is a food scientist who has published about 150 scientific articles, including papers for 5 international symposia, and is a member of the Food Protection Committee of the National Academy of Sciences. He was chairman of an ad hoc committee which in 1965 prepared the NAS publication, "Microbiological Contamination of Foods."

OVALE MALARIA

*USDHEW PHS NIH NIAID Press Release
MADER-496-5717, 17 May 1966.*

A relatively rare African form of malaria may not be as rare in the United States as current reports indicate.

The nature of ovale malaria—generally a rather mild, self-terminating disease—and its varying effect on individual victims, plus a delay in some cases of 1 to 4 years between infection and primary attack, may result in the dismissal of the disease as "a cold," "flu," or "fever of unknown origin."

Drs. William Chin and Peter G. Contacos of NIAID recently reported in the American Journal of Tropical Medicine and Hygiene a case of ovale malaria acquired by Dr. Chin in West Africa that only became evident 1 to 3 years later. Both scientists, of the Institute's Laboratory of Parasite Chemotherapy, are currently working with the Malaria Project at the Atlanta (Ga.) Federal Penitentiary.

Dr. Chin, who served as a Peace Corps physician to Ghana and Togo from Sept 1961 to Jul 1963, first became ill on Oct 17, 1964, more than a year after his return to this country and more than 3 years after his first possible exposure in Africa.

At first, he did not himself consider the possibility of malaria. Rather, he suspected an acute upper respiratory infection. The attacks of malaise, headache, and fever recurred, however, and 4 days later a volunteer was inoculated with blood from Dr. Chin. The volunteer developed ovale malaria. After

2 days of treatment with chlorguanide hydrochloride, Dr. Chin's blood was free of the parasite *Plasmodium ovale* and remained so 4 months later.

The scientists reported that relapses in ovale malaria are rare and attributed that in part to rapidly developing acquired immunity, shown by the short course of the natural infection. The delayed primary attacks (other scientists have reported cases with latent periods of 1.8 years, 3.5 years, and 4 years) represent late tissue parasite activity.

The number of reported cases of ovale malaria is low—6 in the United States in the past 2 years—when compared with the more than 1,000 Peace Corps volunteers returning in 1964 alone from areas of Africa where *P. ovale* is endemic. The scientists termed it “indeed remarkable” that no ovale malaria had been reported from this group, but concluded that all did not have the same exposure to the disease and that many of the possible cases might not yet have become apparent.

Some infections may not have come to medical attention at all, and others “were probably discarded into the waste basket category of ‘fever of unknown origin’” by physicians who did not know of the patients' recent trips to malarious areas.

It is concluded that some of the diagnosed cases of the disease are not being reported. They commented: “The fact that nearly half the reported cases in this country in recent years were from persons working with or having keen interest in tropical medicine seems hardly coincidental.”

VIRUS IN URINE

Brit Med J 1(5533): 126, Jan 21, 1967.

In patients with acute viral infections the virus is often present in the blood, throat, feces, urine, or occasionally the cerebrospinal fluid. Viruses can be found in the urine in three ways: firstly, by detection of inclusion bodies in the cells of the urinary sediment; secondly, by specific immuno-fluorescence of the cells; and thirdly, by isolation of the virus in tissue culture or some other way.

Inclusion bodies have been recognized as evidence of viral infection for more than 60 years. Before the development of modern virological techniques they provided an important means of confirming the diagnosis of infection. Among the best-known examples are the Guarneri bodies of smallpox and the Negri bodies of rabies. Inclusion bodies are acidophilic or basophilic-staining masses seen in the nucleus or cytoplasm of infected cells. Some are

composed of virus particles which may be partially masked by ground substance. Others appear to be homogeneous and may be a sequela of cell damage rather than due to the presence of the virus itself. Cells containing inclusion bodies have been observed in the urine in various infections—for example, cytomegalovirus infection, varicella-zoster, rubella, measles, mumps, and herpangina, and also in children after immunization with live poliovirus vaccine. However, inclusion bodies are sometimes seen in cells in the urine of healthy children and adults and of patients with non-viral disease. This has suggested they are due to degenerative changes in cells and are not associated with a specific disease. Electron-micrographs of inclusion-bearing cells in the urine of patients with measles have failed to show virus particles within the inclusions, and at the same time attempts to find viral antigen in the inclusions were also unsuccessful.

But though viral antigen is apparently not in the inclusion bodies themselves it has been detected by immuno-fluorescence in urinary cells in cases of viral infection. With this technique Coxsackie virus type B5 has been found in the urine, and more recently R. Llanes-Rodas and C. Liu have observed fluorescence in the cells of the urinary deposit in cases of measles. The fluorescent cells were seen in 38 of 42 patients with measles and in 12 of 14 children who had had live measles virus vaccine. There was no fluorescence in samples from 20 control patients with other infections. The antiserum used in this work was obtained from pooled samples of serum from children convalescent from measles and cannot be regarded as specific, since it would almost have contained antibody to other viruses. However, all the cases of measles were confirmed by conventional virological techniques, and it is probable that the fluorescent cells in the urine did indeed contain measles virus antigen. There can be no doubt that measles virus was present in the urine of several of these patients, because the virus was isolated in tissue culture from specimens from 11 of the 42 patients.

Viruria in fact seems to be not uncommon in cases of viral infections when a search is made for it. In addition to measles it has been reported in infections with cytomegalo-viruses, Coxsackie viruses, vaccinia, rubella virus, adenoviruses, and mumps virus. Viruria appears to be especially common in mumps, being found in all 21 patients in one study and in 15 of 20 patients in another. In the second study mumps was found to have impaired the renal function of all 20 patients, for tests of it

gave abnormal results at some time in the course of the disease. The disturbance was mild and transient and did not appear to be due to fever. However, it suggests that viruria is due to direct infection of the kidney cells rather than to a filtering of the virus into the urine during viraemia.

Certainly the kidneys are attached in congenital infection with cytomeglaoviruses and rubella virus, and impaired renal function has been described in one case of infection with Coxsackie virus type B3 in which viruria was noted. Examination of the kidneys of five children who died of measles showed some hyperplastic and degenerative changes in Bowman's capsule, and in the case of one child inclusions were seen in the cells of the capsule. These changes were of a minor nature, but nevertheless suggest that the virus infects the kidney in measles also. Experiments have shown that in mice infected with herpes simplex virus viruria was not associated with viraemia but appeared to be due to seeding of the urine with virus from infected cells in the renal tract as a result of disseminated infection. The pathogenesis of viruria in man may be similar, so that viruses may fairly commonly infect the renal tract in the course of acute systemic infections.

Viruria is an important feature of virus infection. It may turn out to be a useful method of diagnosis, and it is one way in which virus may spread from patient to patient.

VACCINE TO PREVENT STREPTOCOCCUS INFECTIONS

Public Health Rep 82(3): 249, March 1967.

A vaccine to prevent streptococcus infections, which frequently lead to rheumatic fever in children and glomerulonephritis in adults and children, is being tested by University of Chicago scientists.

The vaccine is prepared by purifying a protein, called the "M protein," from the cell wall of the streptococci which cause the infections.

The vaccine has been found safe and effective in extensive tests with mice, rabbits, and guinea pigs. It has led to no serious reactions and has increased levels of antibodies against streptococcus organisms in nearly 50 adults tested. However, only further testing, particularly in infants, will demonstrate its effectiveness in preventing infections under ordinary conditions.

The vaccine is effective against several of the most common types of streptococcus organisms that cause human infections. The Chicago group is working toward developing a vaccine which will be effective

against 5 or 6 types of streptococcus organisms which cause most infections in urban populations. Other attempts to prepare a streptococcus vaccine have failed because the M protein used was not purified sufficiently.

SEARCH FOR A MASS CHEMOTHERAPEUTIC DRUG FOR CHOLERA CONTROL

E. J. Gangarosa, et al, Bull Wld Hlth Org 35(5): 669-674, 1966.

In a study designed to seek a suitable drug for mass chemotherapy during a cholera epidemic, 4 drugs were administered in single doses to patients with cholera in Iran. Streptomycin was administered orally; penicillin, parenterally; and chloramphenicol and a long-acting sulfa drug, both orally and parenterally. No drug consistently eliminated vibrios from the intestinal tract. Chloramphenicol was also administered in multiple doses for 3 days; this also failed to eliminate vibrios in one-third of 25 patients studied. The major problem with these drugs administered orally seems to be rapid elimination and poor absorption by patients with diarrhea. The authors do not recommend any of these drugs for single-dose mass chemotherapy and consider that chloramphenicol cannot be recommended for multiple-dose mass chemotherapy.

MEASLES ERADICATION AND REPORT OF A PROGRAM

PHR, APHA Conf Rpt 1966, USDHEW, PHS, 82(3), Mar 1967; Personal communication between Camp Lejeune and Preventive Medicine Division, Bureau of Medicine and Surgery.

The 4 essential conditions for eradication of measles are: (a) routine immunization of infants, (b) immunization of all susceptible children on entry to school or other place of congregation, (c) surveillance, and (d) epidemic control.

Routine immunization of infants. All infants should receive live measles vaccine at approximately 1 year of age. This practice should become as routine as DPT, polio and smallpox immunizations.

Immunization on school entry. All children not immunized in infancy and who escape the natural disease should be immunized against measles at the time of or just before admission to school. The term "school" must be interpreted broadly to include not only first grade of primary school, but also kindergarten, nursery school, day care homes, and even Sunday schools.

Surveillance. Effective control depends on knowledge of incidence and epidemiologic characteristics of current cases. Since measles has been poorly reported up to the present time, some increase in reported incidence above comparable periods may be expected at the beginning of the eradication campaign.

Epidemic Control. Whenever a cluster of cases of measles, or even a single case is reported in a previously uninfected area, the threat of an epidemic is imminent. Immediate steps should be taken to verify the diagnosis, trace the source of infection, detect other unreported sources, and determine exposed susceptible contacts.

The containment plan should include the administration of immune globulin to exposed susceptible contacts and administration of measles vaccine to all available susceptibles in the surrounding community. Particular emphasis should be directed to susceptible children in kindergarten, nursery schools, and the lower primary grades of public schools.

If such immunization programs are carried out promptly and effectively, an epidemic of measles can be contained within 2 to 3 weeks. The continuation of an epidemic longer than 3 weeks is a clear indication of the inadequacy of the planned control program.

Report of a program. The Medical Department of the Navy, in cooperation with the North Carolina Department of Public Health, embarked on a program to immunize the susceptible children, both military dependents and civilians, in Onslow County, North Carolina.

A planning committee was formed by personnel attached to the Marine Corps Base at Camp Lejeune. This group, with the assistance of the Base Public Information Office, undertook the organization of the publicity campaign. It was immediately recognized that the success of the program was dependent on educating the base population in the seriousness of measles as well as the forthcoming availability of a means of eradication. The Public Information Office prepared press releases for the community and base newspaper. These covered the disease and its complications and announced the details of the immunization program. A taped interview covering the same material was prepared and released through the cooperation of the local television station. Posters and pamphlets were printed by the Base Printing Office and placed in all public areas, including schools, nurseries, commissaries and exchanges. Boy Scouts also placed informational material at each housing unit on the Base. A pamphlet

was given to each school child by teachers to be taken home. Announcements were made at all PTA meetings, at morning muster of most units and by the local radio stations.

In order to obtain an estimate of vaccine needs, the number and ages of all dependents of all military personnel stationed at the base was obtained from the Data Processing Officer. From these figures an estimate of the approximate immunization level by age was provided by the North Carolina Department of Health.

The further attenuated strain (Schwartz) of live measles vaccine was used in order to eliminate the necessity of a second injection of measles immune globulin. The vaccine was obtained in 50 dose vials suitable for use with the jet injector gun.

Two school gymnasiums and a community recreation hall were utilized. In each center the protocol followed was the same: the name, dependent status and age of each person to be vaccinated was logged upon arrival. Following this the accompanying adult briefly reviewed with the interviewer the outstanding contraindications for vaccination. At this time they were given a printed official record of the immunization and a slip outlining the possible sequelae of the vaccination and general guides as to treatment. The person next passed to a table where the arm was swabbed with acetone and finally to the last table where the vaccine was administered. The screening tables were manned by Red Cross volunteers; the remainder of the personnel was composed of volunteer off duty corpsmen. A medical officer was in attendance at each center.

The foregoing operating outline was put into effect on Saturday, 29 October 1966. Over 2,200 doses of vaccine were used on military dependents residing on base.

The Onslow County program was similar in most respects except that a different strain of vaccine was employed, thus necessitating an additional injection of immune globulin; jet guns could not be used. Approximately 700 military dependents received vaccine in the total of 1,700 doses administered.

As part of the continuing program, every effort is being made to administer vaccine to new arrivals in the area. Through the cooperation of the base school system, each new enrollee is automatically referred for measles vaccination if indicated. Measles immunization following a tuberculin test has become a routine item of the well child care program.

KNOW YOUR WORLD

Did You Know?

That due to an increase in canine rabies in Venezuela, and the occurrence of 6 human fatalities early in 1967, all regional and local health services have been instructed to give the highest priority to canine rabies control programs?

Emergency control measures have been instituted in the States of Arauca, Barinas, Bolivar, Merida, Portuguesa, Tachira, Trujillo, and Zulia of Venezuela.¹

That an estimated 12,668,000 persons suffer from some form of arthritis and about 1 in every 4 of them is to some degree limited in his daily activities?

This does not include persons in institutions. An estimated 200,000 victims of the diseases are under age 25, and about 40,000 of them are under 15. Two recent studies have shown that about 3,600,000 persons, ages 18-79, have some form of rheumatoid arthritis.²

That ultrasonic waves audible only to rats and other rodents are emitted by a small pneumatic generator for repelling rats?

The instrument, useful in food plants, bakeries, flour mills, restaurants or storage buildings, discourages rats from entering the area in which the device is in operation and is 80% to 100% effective. The portable unit weighing only 12 lbs operates on 115-volt AC.³

That an outbreak of hemorrhagic fever has affected more than 20 U.S. Servicemen and more than 100 Korean soldiers?

Military authorities in Tokyo, conducting a long-term study of the disease, indicated that the incidence is "at least double" the usual number of cases and that there has been "some mortality." It is suggested that the disease may be a zoonosis transmissible to man by contact whereas heretofore, the vector was believed to be a mite or chigger, but "it is possible that the disease, which usually affects field troops, is spread by contact with excreta of animals."⁴

That the prevalence of simple goitre in 4,748 Glasgow schoolchildren was 13.3%, in 968 Dumfries children it was 15.5% and in 486 Nithsdale children it was 29.8%?

A recent survey concluded that the cause in Glasgow and Dumfries, Scotland is an intrinsic, female, endocrine factor and in Nithsdale it is mainly environmental, due to an iodine-deficiency state or goitrogenic substances in the local vegetation, water and milk.⁵

That 1 death of suspected smallpox in an infant 11 months old and 9 cases with 2 deaths were notified in Kuwait, on 12-13 April 1967?

Origin of the infection is unknown. Mass vaccinations routinely carried out on all year-round are now concentrated in the area of the focus.⁶

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MANUAL AVAILABLE

CAPT John H. Stover, Jr. MC USN, Commanding Officer, Naval Medical School, NNMC, Bethesda, Md., announces that a limited supply of a new publication, *Some Harmful Plants of Southeast Asia*, is available for distribution. This manual has been prepared to provide medical department personnel with some insight into plant associated medical problems. While the title concerns itself with Southeast Asia only, most of the plants included in the manual occur throughout the tropics. Because of the limited supply available at this time, requests will be carefully screened.—Public Affairs Office, NNMC, Bethesda, Md.

EYE RESEARCH

A new publication, *Eye Research*, has been released by the National Institute of neurological Diseases and Blindness (of the National Institutes of Health), the Public Health Service's primary research unit concerned with vision research.

Written for the general reader, this 44-page illustrated pamphlet reviews the known causes and current treatments from more than 20 blinding disorders as well as the latest research findings. It includes discussions of cataracts, glaucoma, retinal detachments, injuries and tumors of the eye, uveitis, and refractive errors.

An estimated 30,000 Americans lose their eyesight every year. Institute officials hope that continued research coupled with programs of early detection of eye disorders will reduce this toll.

Several recent advancements, described in the pamphlet, offer encouragement:

* Glaucoma now can be combatted by early detection and treatment in most cases.

* Some viral infections of the cornea (the transparent membrane covering the colored portion of the eye) can be treated successfully with drugs.

* Investigation of cataracts has led to information about the aging process of all cells.

Listed as Public Health Service Publication No. 1502, *Eye Research* may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20402 for 35 cents.

NAVY MEDICAL CIVIC ACTION—VIETNAM

The Navy Medical Department has produced a short color sound film depicting the role of Navy medicine in the Civic Action Program in Vietnam.

Portions of the film portray the work of the Navy surgical team assigned to the Agency for International Development (AID) at Rach Gia. Here the Navy medical personnel travel to the outlying villages to treat the sick and injured, sending the more serious cases to the home base hospital for further care.

Scenes aboard the Naval Hospital Ship REPOSE demonstrate the care and treatment given a small Vietnamese boy who had been found abandoned in the jungle. Upon his recovery a good home was found for him in a Vietnamese orphanage.

* Medical scientists are developing a better understanding of the close relationship between eye disorders and diabetes, German measles, and diseases of the nervous system.

Hospital Corpsmen serving with the Fleet Marine Forces in the I Corps Area are also shown giving medical care to the local civilian populace during free time away from their military duties. Non-medical projects such as the construction of playground equipment for a nearby orphanage is also undertaken.

Copies of the film will be produced and made available for showing by military activities and for use by civic and professional organizations as part of the Navy's overall community relations program.—Public Affairs Office, BuMed.

NUCLEAR CARRIER RESPONDS TO MERCY CALL

High seas, strong winds, and heavy overcast provided the setting for a dramatic mission of mercy in the Gulf of Tonkin on the first day of the new year.

A sailor on board the destroyer Fletcher (DDE 445) was hurled against a gun mount by a wave crashing over the deck. The man, seaman Robert F. Wagner, suffered a serious back injury, requiring medical attention beyond the capabilities of the Fletcher.

The Fletcher, steaming in company with the nuclear attack aircraft carrier Enterprise (CVA (N) 65), radioed the larger ship for assistance. Only minutes after receiving the destroyer's request for aid, pilots and crewmen of Helicopter Support Squadron One, Detachment M. attached to the Big "E", were preparing the UH-2 "Seasprite" helicopter for flight.

Also responding quickly was LT William G. Akins, a flight surgeon with Carrier Air Wing Nine, embarked on the Enterprise.

From the rolling, spray-splashed carrier deck, the helicopter carrying the doctor, and piloted by LCDR Robert S. Collins, officer-in-charge of the helo detachment, and LTJG Harry "Max" Borders, roared into the dark skies toward the Fletcher.

Making a cautious approach to the storm-tossed vessel, the pilot hovered over the fantail.

The first attempt at lowering Doctor Akins by sling onto a hastily-prepared landing zone on the fantail failed. "I began to swing from side to side out over the ocean," the doctor said. On the second try, the doctor was successfully lowered onto the heaving deck. The doctor said, "Coming down from the helo wasn't as bad as trying to walk on the destroyer. I could hardly stand up."

After examining the patient the doctor decided that the more complete medical facilities on Enterprise would be needed to care for the man.

He was taken to the hovering helo, and while the aircrewman guided the hoist wire, the man was brought up and maneuvered into the chopper's cabin. With its human cargo tucked safely inside, the helo whirled for home.—NavNews, Washington, D.C.

NAVY WOMAN ELECTED TO AEROSPACE OFFICE

A woman has been elected vice president of the Aerospace Medical Association. She is CAPT Mary F. Keener, a Navy Medical Service Corps officer.

CAPT Keener is the first Navy woman to hold the Association office. She also is the first woman officer to make captain in the Medical Service Corps.

The Aerospace Medical Association deals with the medical aspects of astronautics and aerospace medicine. CAPT Keener has trained thousands of aviation personnel in the use of oxygen equipment, ejection seats, low pressure chambers and other related areas.

An aviation physiologist, she is head of the Aerospace Physiology Section at the Bureau of Medicine and Surgery.—NavNews, Washington, D.C.

NAVY MEDICAL DEPARTMENT PARTICIPATES IN AEROSPACE MEDICAL CONVENTION

A Navy doctor presented a paper on "Aero-medical Monitoring of Naval Aviators during Aircraft Carrier Combat Operations" at the 1967 Aerospace Medical Convention held in Washington, D.C., April 10-13.

CAPT Frank H. Austin, MC USN, who headed the Navy/NASA bio-medical team during its stay aboard an attack aircraft carrier in the Tonkin Gulf last fall discussed collection of physical and non-physical stress data in a combat environment. The information was recorded by means of electrodes on the pilot's chest being monitored by a tape recorder during flight.

It is anticipated that the ultimate findings will be extremely useful in conducting advanced research programs concerning pilots under stressful flight conditions.

The paper was one of several presented by Navy physicians during the five day conference.—Public Affairs Office, BuMed.

DEPARTMENT OF THE NAVY
BUREAU OF MEDICINE AND SURGERY
WASHINGTON, D.C. 20390

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NAVY - QUARTERLY LETTER
TO WASHINGTON

A special issue of the Navy Medical News Letter, Volume 49, Number 1, is being published in the first issue of the quarter. This issue contains a special section on the medical aspects of the Vietnam conflict.

CAPT KROG is the first Navy aviator to hold the Association of Air Surgeons' Certificate of Merit. This certificate is awarded to aviators who have demonstrated exceptional achievement in their field.

The Association of Air Surgeons is a professional organization of aviators and flight surgeons. It was founded in 1945 and has since that time been dedicated to the advancement of the medical profession in the military.

An aviation flight surgeon is a medical officer who is qualified to provide medical care to aviators. He is trained in the treatment of injuries and illnesses that are common to aviators.

NAVY MEDICAL NEWS LETTER
PUBLISHED BY THE BUREAU OF MEDICINE AND SURGERY
WASHINGTON, D.C.

The Navy Medical News Letter is a quarterly publication that provides medical news and information to the Navy. It is published by the Bureau of Medicine and Surgery, Washington, D.C.

CAPT BRUCE is a flight surgeon who has been assigned to the USS Intrepid (CV-11). He is responsible for the medical care of the crew and passengers of the ship.

The Intrepid is a guided missile cruiser that is currently on a tour of the West Coast. She is the only guided missile cruiser in the Navy that has been assigned to a permanent home port.

It is anticipated that the Intrepid will be assigned to a permanent home port in the near future. This will allow her to provide medical care to the crew and passengers of the ship on a permanent basis.

The Intrepid was one of several ships that were assigned to the West Coast during the Vietnam conflict. She provided medical care to the crew and passengers of the ship during this time.

POSTAGE AND FEES PAID
DEPARTMENT OF THE NAVY

The Navy Medical News Letter is published quarterly and is available to all active and reserve personnel. It is published by the Bureau of Medicine and Surgery, Washington, D.C.

Copies of the letter will be furnished and made available for shipment by military activities and for use by civil and professional organizations as part of the Navy's public relations program.

Public Affairs Office, Navy

MULTIPLE GARRICK RESPONDS TO
MERCY CALL

That was the way word and heavy medical relief was sent to the crew of the USS Intrepid (CV-11) in the Gulf of Tonkin on the first day of the new year.

A report on board the destroyer Intrepid (DD-961) was passed against the words of a sailor standing next the deck. The man standing there was a young man whose face had been severely injured by a medical accident aboard the destroyer in the Pacific.

The accident occurred in command of the Intrepid while she was underway in the Gulf of Tonkin. The accident resulted in the death of a sailor and the injury of another sailor.

The accident occurred while the Intrepid was underway in the Gulf of Tonkin. The accident resulted in the death of a sailor and the injury of another sailor.

Also responding quickly was LT William H. Adams, a flight surgeon with the Intrepid. He was assigned to the Intrepid during the Vietnam conflict.

From the Intrepid, Adams quickly responded to the Intrepid's request for medical assistance. He was assigned to the Intrepid during the Vietnam conflict.

Adams, a flight surgeon with the Intrepid, was assigned to the Intrepid during the Vietnam conflict. He provided medical care to the crew and passengers of the ship during this time.

The Intrepid was one of several ships that were assigned to the West Coast during the Vietnam conflict. She provided medical care to the crew and passengers of the ship during this time.

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