NavMed 369

UNITED STATES NAVY

MEDICAL NEWS LETTER

Editor - Captain F. W. Farrar, MC, USN

Vol. 11 Friday, 7 May 1948 No. 10

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Regional Enteritis - Diagnosis and Treatment: The management of regional enteritis presents greater problems at the present time than does the diagnosis. Improved clinical and roentgenologic methods have increased the frequency and ease of diagnosis, as manifested by the relatively large number of cases being reported in the literature. Prolonged experience emphasizes the inadequacy of some of the previously accepted methods of treatment, and in some instances recurrences, serious complications, and extensive involvement of the intestine make present methods of management unsatisfactory. Failures in management are due in part to the fact that the cause of regional enteritis is unknown.

A series of 55 cases of enteritis, terminal ileitis, and enterocolitis is presented, emphasizing the main points in diagnosis and comparing the results of the various types of treatment employed in their management. The patients were seen at the Cleveland Clinic between the years of 1934 and 1946. The diagnosis in fifty-three of the cases was proved by operation. Forty patients were followed from one to 13 years, with the average duration of observation being 5.2 years. Of the remaining 15 patients, 7 died after operation. Six of these patients developed peritonitis and died within from one to 43 days. The other patient made a satisfactory immediate convalescence. However, after discharge from the hospital her progress was not satisfactory. She died 5 months later and at autopsy a large subdiaphragmatic abscess was found. No follow-up studies were made in the other 8 cases.

In this group of 55 patients, the average age was 28.5 years, with 29 patients in the third decade; 31 were males and 24 were females.

The duration of symptoms varied from one month to 15 years, 29 patients having had symptoms for less than one year. The majority of patients had symptoms suggestive of ulcerative colitis, namely diarrhea with cramplike abdominal pain. Three patients had acute surgical conditions within the abdomen; one was suspected of having acute diverticulitis with perforation, and two were thought to have acute appendicitis. At operation all were found to have regional enteritis. Five patients had symptoms suggesting partial intestinal obstruction. Roentgen examination revealed evidence of significant obstruction in the region of the terminal ileum in several others. One patient, a woman of 21, complained of swelling, redness and tenderness of the joints and fever of three weeks' duration. She also had a psoriatic type of skin eruption. During the course of her examination blood was found in the stools, and further studies revealed the presence of terminal ileitis, which was later proved by operation. There have been reports of cases of proved regional enteritis in which there was fever but no abdominal symptoms.

Weight loss is often a striking feature of this disease. It was significant in 33 cases of this series. A 56-year-old man had lost 80 pounds in a 5-month period of time and was suspected of having a carcinoma of the right colon because upon examination a mass was found in the right lower quadrant of the

abdomen. At operation he was found to have an acute inflammatory involvement of the terminal 12 inches of the ileum with an internal fistula leading to an abscess in the right colic gutter.

Perforation of the bowel with fistula or abscess formation was a common complication in this group of patients. Fourteen had external fistulas in the right lower quadrant of the abdomen draining pus and/or fecal material, two patients having several such openings. The external fistulous openings were usually small, but their connection with the bowel could be demonstrated by roentgen examination after the injection of lipiodol. Nine of the patients had fistulas-in-ano and 7 more gave a history of a previous fistulectomy. Eight had internal fistulas. Two of the latter had passed gas and fecal contents in the urine and upon examination were found to have vesicocolic fistulas. Four had tracts leading from the small bowel to abscesses in either the right psoas, right colic gutter, or pelvis. Another patient had a communication between the ileum and sigmoid, and one had a fistulous tract between the ascending and transverse colon. There were no instances of free perforation with generalized peritonitis. This frequency of fistula formation probably gives a false indication of its general incidence, because a large number of difficult surgical problems are referred to the Clinic.

Forty-five patients had definite tenderness in the right lower quadrant, and in 24 an abdominal mass was palpated. Digital rectal examination disclosed a mass in the right side of the pelvis in two patients. Twenty-seven patients had fever which was usually of the low-grade type; however, in those patients with abscess formation the fever was spiking in character and sometimes accompanied by chills. Most of the patients were malnourished, and in 9 emaciation was marked. Although signs of vitamin deficiency were not outstanding, one patient showed objective evidence of B-complex deficiency and had subacute combined degeneration of the spinal cord.

Roentgen study of the colon is essential in all patients suspected of having regional enteritis. Usually the flow of a thin stream of barium through the involved segment of the small intestine can be demonstrated. This is the popular "string sign" first described by Kantor. In the experience of the authors the regurgitation of barium through the ileocecal valve during barium enema study has been a most helpful method of demonstrating this lesion, particularly when it is located in the terminal ileum. Examination of the colon also serves to demonstrate the presence of coexisting colitis with or without skip areas and may arouse suspicion concerning the presence of this disease if the terminal ileum cannot be filled. If there is suspicion of regional enteritis, it is important to study the motility of the small intestine in addition to examining the colon roentgenographically, because in some instances this is the only means of demonstrating the lesion, particularly if it lies above the terminal ileum. The progress barium meal examination should also be done to demonstrate skip areas of involvement proximal to a lesion previously demonstrated by barium enema. An initial plain film of the abdomen is often of value when the disease is complicated by obstruction. It will not differentiate this disease from other causes of intestinal obstruction.

Significant anemia of the microcytic hypochromic type was present in 20 patients in this series. The white blood count was elevated in only 11 instances. Stool examination may show the presence of pus, occult blood, or fatty acid crystals, but these findings are not diagnostic and are irregular in occurrence. Proctoscopic examination should be made in all cases to exclude the presence of coexistent ulcerative colitis. In some instances edema and/or small punctate ulcerations may be noted in the rectal mucosa. The authors believe that these findings may be secondary to the inflammatory changes in the ileum, either as a result of direct extension to the rectal wall which may be in close proximity to the loop of involved ileum, or of irritation of the rectal mucosa by purulent fecal contents.

The diseases which may be confused most commonly with regional enteritis are (1) ulcerative colitis, (2) appendicitis, (3) intestinal tuberculosis, (4) tumors of the small bowel, and (5) amebic granuloma. Ulcerative colitis can usually be differentiated with the aid of a proctoscope and an x-ray examination of the colon. Ordinarily the rectum and colon are primarily involved in ulcerative colitis.

Careful evaluation of the history is most important in differentiating the acute form of regional enteritis from appendicitis. The eliciting of mild antecedent symptoms of cramplike abdominal pain, weight loss, and diarrhea will lead to careful roentgenologic examination and may establish the diagnosis. A normal roentgenogram of the chest and negative stool examination for tubercle bacilli will usually exclude intestinal tuberculosis. If clinical signs and roentgen examination fail to differentiate this disease from a neoplasm of the small intestine, exploratory laparotomy is indicated. The positive finding of Endamoeba histolytica in the stools and a favorable response to antiamebic therapy constitute evidence against regional enteritis.

Although there is considerable controversy concerning the management of this disease, the treatment which should be employed depends primarily upon the stage and extent of involvement and complications at the time the diagnosis is established. There is general agreement regarding the more conservative medical management of the acute forms of regional enteritis. It is in the chronic cases that authorities disagree upon the indication for surgery and on the merits of sidetracking operations with transection of the ileum versus resection of the diseased bowel.

In 6 patients of this series treated medically the management included bed rest, high caloric, high protein, low residue diet, vitamin supplements, correction of anemia, and the use of various sulfonamide preparations. Four of these patients had had exploratory laparotomy, at which time the diagnosis was confirmed and further surgical procedures were deemed inadvisable. One of these patients died of sepsis 30 days after operation. Of the 6 patients, 3 have made satisfactory progress on medical management. Sulfapyridine seemed to be of value in one case, and phthalylsulfathiazole (sulfathalidine) appeared to be beneficial in another. Two patients were not followed.

Surgical treatment was carried out in 49 of these patients. Twenty had sidetracking operations, including ileostomy and ileocolostomy, without transection of the bowel distal to the anastomosis. One patient had an ileotransverse colostomy with transection of the ileum. In some of these cases, this operation was chosen because the surgeon believed the inflammatory process was too acute to perform an extensive resection safely. The over-all results (see table below) have not been satisfactory. The two patients classified as

	Total	Satisfactory	Poor	Not Followed	Died
Ileostomy	2		1		1
Ileocolostomy without transection of bowel	16	2	7	3	4
Ileocolostomy with transection	1		1		0
Entero-enterostomy	2		1		1
Total	21	2	10	3	6

having good results have been in excellent health, one for 3 years and one for 7 years. Of the 12 patients who were followed, 10 did not improve. Seven subsequently had resection of the diseased bowel and have been included among the 35 patients with resection (mentioned below). Five of these 7 patients improved after resection of the diseased bowel, one convalesced poorly because of persistent diarrhea, and one has not been followed. Of the 3 remaining patients in whom there were poor results from the sidetracking operation, one has extensive segmental involvement of the jejunum and ileum and has required an entero-enterostomy on two occasions for partial intestinal obstruction. Another had an ileostomy done elsewhere. This patient was advised to have a resection of the diseased segment of ileum but declined and has had repeated hemorrhages from the ileostomy. The last patient had an ileocolostomy without transection of the ileum, performed elsewhere. Her disease is now inadequately controlled both clinically and roentgenologically.

Thirty-five patients had resection of all obviously diseased bowel. Necessary anastomotic procedures were carried out. Usually an ileotransverse colostomy was performed. A two-stage procedure was employed in 15 patients, including the 7 who had had sidetracking operations. There were no deaths immediately following operation. The results were satisfactory in 23, poor in 8, and there was no follow-up in 4. Those with satisfactory results are all able to carry on their usual activities. Several of them have 3 or 4 loose stools per day at times. Roentgen examination has not revealed a recurrence of the disease. This tendency to diarrhea is believed to be related to shortening of the bowel with decreased absorptive area as a result of operation. Concerning the 8 patients with poor results, preoperative symptoms persisted in 6, and in 2 there was a recurrence of the disease, proved at operation 9 and 1/2 and 6 years after initial resection.

The methods of treatment employed in the 40 followed cases have accomplished satisfactory results in 28 instances. Resection of all of the diseased bowel was most beneficial. Medical treatment may be tried in the acute or chronic mild cases without complications. Extensive segmental enteritis without complication may be treated better by conservative measures than by resection. If patients with this disease are followed up for a prolonged period, some recurrences will undoubtedly be seen. Crohn has reported a case in which there was a known recurrence 12 years after the initial operation and, as mentioned above, one patient of this series had a recurrence 9 and 1/2 years after the initial operation. (M. Clin. North America, March '48 - H. R. Rossmiller and H. M. Messenger)

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Spontaneous Pneumothorax: It is the purpose of this paper to present 100 consecutive, unselected cases of spontaneous pneumothorax in patients admitted to the Boston City Hospital in a nine-year period between 1934 and 1943. During the same period approximately 375,000 patients were admitted to the hospital, making an incidence of 0.027 percent.

The diagnosis in each case was made on the basis of the history, physical signs, and x-ray findings. Positive findings by x-ray were considered essential, and the diagnosis was not made in their absence.

The patients were divided into two groups, one consisting of 64 cases in which underlying pulmonary disease was known to be present prior to entry or was discovered during hospitalization, and the other comprising 36 cases of spontaneous pneumothorax occurring in apparently healthy persons.

The history, symptoms, and signs presented by the patients of both groups were essentially the same. Twenty percent of both groups gave a history of unusual exertion prior to the acute episode. Of these, 6 gave a history of strenuous lifting, 4 of severe coughing, 3 of running upstairs, 2 of attacks of sneezing, and 1 each of wrestling, playing tennis, rowing a boat, missing a step going downstairs, and cranking an automobile. In the remaining 80 percent the pneumothorax occurred during usual daily activities or at rest. In their series of 58 cases Ornstein and Lercher found a history of exertion in 22 percent.

Chest pain associated with the involved lung occurred in every patient; there was occasional radiation of the pain to the abdomen, neck, or lower back. Dyspnea was also universally complained of, but frequently appeared to be more subjective than objective. Cough and fever were common in the patients with underlying pulmonary disease, but only 5 of the apparently healthy patients complained of cough, and only 3 had an elevated temperature, which was slight. Hemoptysis occurred in 2 of the patients with tuberculosis.

The physical signs of pneumothorax varied with the degree of collapse. It was generally found that when the degree of pneumothorax was more than 40 percent, classic signs could be elicited. These included hyperresonance, diminished or absent vocal and tactile fremitus, absent breath sounds, mediastinal shift, and positive coin test. Right-sided and left-sided pneumothorax occurred with equal frequency in both groups of patients. One patient with bilateral spontaneous pneumothorax had far advanced bilateral tuberculosis.

The table below shows the incidence of the various pulmonary disorders that were found associated with the patients in the first group.

Disease	Total No. of Patients	Male Patients		Female Patients		Average Age
		No.	Percentage	No.	Percentage	yr.
Tuberculosis	38	29	76	9	24	44.0
Emphysema	5	4	80	1	20	59.6
Bronchiectasis	5	4	80	1	20	43.0
Postpneumonic empyema	4	3	75	1	25	50.0
Bronchial asthma	3	3	100	0	0	36.0
Lung abscess	3	0	0	3	100	32.0
Metastatic carcinoma of lung	2	2	100	0	0	54.0
Pneumonia	2	1	50	1	50	80.0
Bronchogenic carcinoma	1	1	100	0	0	61.0
Pulmonary infarct	1	0	0	1	100	17.0
Totals	64	47		17		
Averages			73.4		26.6	46.1

The occurrence of a spontaneous pneumothorax in a patient above the age of forty-five should make one strongly suspicious of the presence of underlying pulmonary disease.

Of the 36 cases in the second group 30, or 83.3 percent, occurred in male patients. This predilection has been reported by all previous investigators. There was an age range of from 3 to 53 years, with an average age of 27 years and one month. Twenty-one patients in this group were successfully followed for periods ranging from one and a half to 12 years. Of these, 2 had died of other causes: 1 of cirrhosis of the liver 5 years after the occurrence of the pneumothorax, and the other of acute yellow atrophy of the liver 2 and 1/2 years after the original attack. Post-mortem examination of the lungs in the latter case was reported as negative. Three patients of this second group had multiple recurrences - an incidence of 14.3 percent (in other series a recurrence rate of from 10 to 30 percent has been reported). One of these 3 patients estimated that he had had from 18 to 20 attacks. Because roentgenographic study of his chest was negative 6 and 1/2 years after the original attack, he was considered a candidate for the induction of a chemical pleuritis. One female patient had a total of 7 recurrences and had a negative roentgenographic examination of the chest 12 years after the original attack. The third patient had a total of 7 recurrences; between the fourth and fifth attacks he developed clinical and roentgenographic evidence of tuberculosis, and he died 3 and 1/2 years after the first occurrence of pneumothorax. After his first 4 episodes of pneumothorax, the lung fields had appeared clear after re-expansion, and during the first and second admissions tuberculin tests had been negative in dilutions of 1:100. This patient represents the only one in the second group

who was known to have developed tuberculosis. Kjaergaard followed 49 patients with pneumothorax but who were otherwise apparently healthy and found only 1 who developed tuberculosis subsequent to spontaneous pneumothorax. In a review of the literature Perry could find a record of only 6 persons developing tuberculosis after a benign spontaneous pneumothorax.

One patient had a typical attack of spontaneous mediastinal emphysema 3 years after the first occurrence of pneumothorax and was alive and well 9 years later.

All patients were treated with bed rest and symptomatic medication to relieve pain and cough. Aspiration of air to relieve dyspnea was done in 3 cases. Whenever possible, appropriate therapy was directed toward the underlying condition in patients in whom it was present. Patients with tuberculosis were transferred to sanatoriums shortly after admission. Hospitalization of the otherwise apparently healthy patients varied from 2 to 36 days, with an average of eleven days. There was no immediate mortality in this group. Four patients with demonstrable underlying pulmonary disease expired during the hospital stay.

The prognosis in the apparently healthy person with a spontaneous pneumothorax is excellent from the standpoint of both immediate recovery and the subsequent nondevelopment of tuberculosis. (New England J. Med., 1 April '48 - R. M. Myerson)

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Diverticulitis, Particularly in the Female: Diverticulitis is an inflammatory disease of diverticula of the colon. It is easily recognizable and, both medically and surgically, is much more satisfactorily treated than previously with a very marked reduction in the operative mortality rate.

The incidence of diverticula (diverticulosis) of the colon is not accurately known. Morton reported the incidence of diverticulosis to be 15 percent in 8,500 necropsies, and Brown of the Mayo Clinic reported that diverticulosis was seen in 8.5 percent of the patients examined roentgenologically and in 5 percent of those who came to necropsy. As Brown also said, these figures must be considered in terms of age, for it is known that diverticula of the colon are rarely seen in persons less than 30 years old, that 4 percent are encountered in persons between the ages of 30 and 40 years, and that approximately 95 percent occur in persons 40 years of age or older.

It appears that diverticula of the colon are acquired and not congenital. Why some individuals acquire them and others do not is unknown, but it can be reasonably supposed that defects of the musculature of the wall of the colon are related to the development of these pouches, and that increased pressures within the bowel cause herniation of small portions of the mucosa through the wall of the bowel at areas of least resistance.

It has been estimated by Abell that from 10 to 20 percent, and by Brown and Marcley that from 12 to 16 percent of persons with diverticulosis ultimately will have diverticulitis. In a recent surgical study of this disease, Pemberton, Black, and Maino reported that of 600 patients who had diverticulitis, 144, or 24 percent, were treated surgically, so that from their experience they feel it could be said that in about one of every 4 patients with diverticulitis complications requiring surgical treatment will develop.

About 80 percent of diverticula of the colon are located in the sigmoid, and the remaining ones are distributed in a decreasing proportion toward the cecum. Weber said that he practically never sees diverticulitis situated above the crest of the ileum in a roentgenogram of the colon. Because the sigmoid colon is in close proximity or adjacent to the female pelvic organs, diverticulitis of this segment of the bowel can and does extend to these other structures. Diverticulitis can involve the adnexa on either one side or both sides and occasionally the urinary bladder, but the latter has some protection from the sigmoid when the uterus is in its normal anterior position. The importance of the differential diagnosis of lesions of the sigmoid and the female pelvic structures is immediately apparent.

The symptoms of diverticulitis are those related to some inflammatory process within the abdomen, usually in the pelvis or low in the left lower abdominal quadrant. These are pain, increase in temperature, and leucocytosis. If the process is a recurring one, or one of several weeks' duration, there may be signs of obstruction, perforation, formation of abscess, and fistula, either enteric, vesical, or cutaneous. The symptoms depend on the severity of the inflammatory process and its progression, for, the process may be confined to the diverticulum only, but in some instances a small abscess will form, and perforate and extend along the wall of the bowel, producing a thickened, narrowed tubelike structure with partial or complete obstruction of the colon. If the abscess extends to the adnexa, the signs become those of a tubo-ovarian abscess or abscess of the cul-de-sac of Douglas.

Sigmoidoscopy frequently is of very distinct aid in establishment of the correct diagnosis, or at least, in giving such evidence as to cause the physician to be strongly suspicious that diverticulitis is the basis of the difficulty. For example, Jackman and Buie reported five signs that indicate diverticulitis: (1) limited mobility of a segment of the bowel that normally is freely movable, (2) angulation of the upper part of the rectum because of inflammation, (3) reduced lumen and adherent mucosal folds, (4) sacculation of the sigmoid, and (5) actual visualization of the diverticula.

The roentgenologist is most helpful in determining the diagnosis by means of the barium enema. If the lumen of the colon is completely obstructed, then all the roentgenologist can state is that there is obstruction which may be inflammatory or malignant, but if the barium will pass through and above the lesion, a picture results which can be interpreted as characteristic of an

inflammatory or malignant condition. In the former instance the mucosa is uninvolved; it presents a feathery appearance, and the lesion extends along the bowel, whereas in the latter case the mucosal pattern ceases abruptly and extends around the bowel, instead of along the long axis of the bowel. When a perforation has occurred and a perisigmoidal abscess supervenes, the barium may pass through the opening and outline the abscess. A sigmoidovesical fistula rarely can be demonstrated by a barium enema, but gas and feces which are expelled from the urethra after the development of some inflammatory process in the left side of the pelvis usually are attributed to diverticulitis.

When a female patient has a mass in the left adnexal region which may seem, on bimanual examination, to be situated a little higher than usual, a roentgenogram of the colon not infrequently is most helpful in differential diagnosis. A carcinoma of the colon without many symptoms referable to the bowel or tenderness may be mistaken for a solid tumor of the ovary. The roentgenologist usually can establish the diagnosis, but at surgical exploration it is quite impossible in some instances to determine grossly if the lesion is inflammatory or malignant. The two lesions have many features in common. It may be suspected that a pelvic mass which has been diagnosed as "pelvic inflammatory disease" or "pelvic tumor" is primarily diverticulitis. The following case is representative.

Case 1. A woman 53 years old came to the Mayo Clinic on 10 January 1946, complaining of constipation. She said she had been perfectly well until 1 December 1945, when she had become constipated. Constipation gradually had become worse during the next three weeks. Then she had begun to have some degree of fever. She had been hospitalized at home for awhile and had improved, but after being discharged she had become worse, so that it was necessary for her to re-enter the hospital. A tumor mass was found in the pelvis, and she was referred to the clinic. On examination she was seen to be rather obese and not acutely ill. The leucocyte count was 12,100, and the erythrocyte count, 4,960,000. Hemoglobin was 12.3 Gm. The sedimentation rate (Westergren) was 45 mm. in one hour. The blood pressure was 124/84. Her temperature was 99° F. On pelvic examination, a mass was found which was diagnosed as a large pelvic tumor, probably uterine, with some compression of the rectum. Pelvic exploration was advised and performed on 16 January 1946 by Doctor Waugh who found a subacute perforating diverticulitis involving the lower two-thirds of the sigmoid. The adnexa were normal. The uterus contained only very small fibroids, which were of no consequence. Gallstones were noted. Extraperitoneal resection of the lower two-thirds of the sigmoid was performed, with removal of all of the involved bowel. A colonic stoma was created; this was closed at a later date.

Acute pelvic inflammatory disease and acute diverticulitis easily may be confused clinically, and a serious diagnostic error may be made. When this possibility presents itself, a roentgenogram of the colon can be most useful. The following case is an excellent example.

Case 2. A woman 43 years old was admitted on the gynecologic service because of lower-abdominal acute crampy pains which had lasted for ten hours. Pain was situated mostly in the left lower quadrant, and was increasing in intensity. The pain was nonextending, but it doubled the patient up and caused her to perspire. It became worse when she moved about. The cramping pains increased gradually and then subsided. Nausea was moderate. There was no change in bowel habits. Menstrual periods were normal. The patient did not appear to be acutely ill. Intestinal peristalsis was normal, but there was acute tenderness over the entire left lower quadrant of the abdomen; this tenderness overlapped the midline. Rebound tenderness was noted. The blood pressure was 130/80. The pulse rate was 108 per minute. The leucocyte count was 13,000. The urine was normal. A copious, creamy-white vaginal discharge was present. There was considerable tenderness when the cervix and uterus were moved. A roentgenogram of the colon revealed diverticulitis which involved the sigmoid, with mild deformity and no obstruction. In about 24 hours an ill-defined mass could be distinguished in the left lower quadrant. Under medical management the process subsided, and the patient was dismissed five days later.

Under appropriate medical management, 75 percent of such cases of diverticulitis will subside but may recur. The nonsurgical management consists of absolute rest in bed until the infection has subsided (from two to three weeks). The application of heat has been found to be very beneficial; diathermy is considered best. Medication consists of from 6 to 8 Gm. of sulfasuxidine daily, 15 minims (0.92 c.c.) of tincture of belladonna three times a day after meals, and a half ounce of mineral oil twice a day; mild sedatives are sometimes needed. A bland diet is always recommended.

Surgical treatment is required for the complications of diverticulitis which are notably perforation, obstruction, and formation of fistulas. It has been observed that the patients in whom these complications usually develop have a more severe and intense illness from the onset than the patients who will not require surgical treatment. The process does not subside completely under medical treatment; the inflammation seems to continue, as a result, usually, of perforation into the bladder, adjacent loop of small bowel or through the abdominal wall, or of the formation of tubo-ovarian abscess. A sigmoidovesical fistula can develop rather insidiously as well as rapidly. The symptoms are primarily vesical, with a considerable degree of dysuria, pyuria, and the passage of particles of feces and of gas through the urethra. Such fistulas never heal spontaneously, as do some cutaneous fistulas from the sigmoid. The following case is a good example of sigmoidovesical fistula.

Case 3. A woman 58 years old first came to the clinic in June, 1943, for exophthalmic goiter. She returned in April, 1946, for recurrent exophthalmic goiter. At her last visit she related that she had experienced some lower abdominal discomfort periodically, but that it was not very severe. She mentioned it because symptoms referable to the urinary system had developed. She also said that she passed some gas through the urethra. Cystoscopic examination disclosed only some cystitis. Pyuria of grade 2 to 3 was present. A roentgenogram of the colon revealed diverticulitis, with perforation and a sigmoidovesical fistula. Operation was advised. On 17 June 1946, a primary lower left rectus incision was made. The sigmoid was found to be adherent to the bladder on the right side near the dome, just to the right of the midline. The bowel was easily separated from the bladder. The fistulous tract was about 1 cm. in diameter. The opening in the bladder was closed with chromic catgut sutures and the segment of sigmoid which contained the diverticulitis was brought out as an extrafascial exteriorization operation. Eleven days later, on 28 June 1946, cautery excision of the exteriorized loop was performed. The remaining colonic stoma was closed about four months later.

Those who are skilled in surgery of the colon are agreed that the cure of most patients with complicated lesions of diverticulitis resides in a multiple-stage procedure, such as colostomy followed weeks or months later by resection of the involved portion of colon, with end-to-end anastomosis, or by exteriorization of the involved segment of bowel. Closure of the colonic stoma or stomas, as the case may be, is accomplished when all healing is completed.

As a general rule, when the diagnosis has been made, the preliminary procedure should be colostomy, carried out at some distance proximal to the lesion and preferably in the transverse colon. Usually, the inflammatory reaction subsides rapidly as relief of the obstruction takes place. The question of whether the colonic stoma later could be closed without subsequent resection

has been debated for many years. It is thought that if from one year to 2 years have passed and all clinical, roentgenologic, and proctoscopic evidence of inflammation has disappeared, then the colonic stoma might be closed. The incidence of recurrence after closure of the colonic stoma still seems to be too high, and it would appear that resection should be performed in a few weeks after colostomy. Pemberton, Black, and Maino reported that in 38 instances of closure of the colonic stoma, there were two deaths postoperatively, and 28 of the remaining 36 patients experienced recurrence of the diverticulitis. Such a rate of recurrence would seem to indicate that colostomy alone is insufficient treatment for complicated diverticulitis.

The surgical risk in the treatment of these complications of diverticulitis formerly was rather high. However, there has been a marked decrease in the operative mortality risk with the introduction of the sulfonamides and penicillin. Pemberton and his co-workers have shown that in a group of 245 patients treated before sulfonamides were available, the mortality rate for all surgical procedures was 14.7 percent, whereas in a group of 144 patients treated with sulfonamides the mortality rate was 4.2 percent. It would seem that after colostomy, removal of the involved segment of the colon is definitely indicated, and that the indications for surgical treatment in recurrent diverticulitis might be extended. (Am. J. Obst. and Gynec., April '48 - V. S. Counseller)

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Effect of Dibenamine on Blood Pressure in Normotensive and Hypertensive Subjects: Experimental evidence in animals showing that the sympathetic nervous system plays an important part in the mediation of reflex elevation of blood pressure has been presented by several authors. In hypertensive patients, lowering of the blood pressure has been induced temporarily by means of spinal or continuous caudal anesthesia, and for longer duration by extensive dorsolumbar sympathectomy. These facts are considered generally to support the theory that a neurogenic factor plays a primary role in the genesis of hypertension.

The clinical evaluation of this neurogenic factor has proven to be difficult. The available tests for determining the presence and degree of the neurogenic element are not satisfactory because they are nonspecific or the drugs employed act too diffusely. Indeed, amytal is a central nervous system depressor, spinal and continuous caudal anesthesia block both autonomic and somatic functions, tetraethylammonium hydrochloride affects both sympathetic and parasympathetic ganglia and depresses the resting blood pressure of both normotensive and hypertensive subjects. The value of the results thus obtained is questionable.

A drug having a relatively prolonged effect and capable of blocking specifically sympathetic impulses would meet the requirements for a desired test. Dibenamine, a new sympatholytic agent, appears to possess these pharmacologic properties.

In order to investigate the role of the neurogenic factor in hypertension, a study of the effect of dibenamine on the blood pressure in normotensive and hypertensive subjects was undertaken.

Structurally, dibenamine (N, N - dibenzyl - β - chloroethylamine - hydrochloride) is related to the nitrogen mustards. Functionally it is a highly specific sympatholytic and adrenolytic drug. The dibenamine used in this investigation was supplied (Givaudan-Delawanna, Inc., Delawanna, N. J.) in ampules as a 5-percent sterile solution in 50-percent alcohol, acidified for stability. It was administered intravenously. An infusion of a solution of 0.9-percent sodium chloride or of 5-percent glucose was first started. When this was flowing freely, the desired amount of dibenamine was added to the flask containing from 300 to 500 c.c. of the saline or glucose solution and mixed thoroughly. The single dosage used averaged 5 mg. per kg. of body weight. The total single dosage, regardless of weight, never exceeded 500 mg. in this study. The infusion was given in most cases over a total period of from 60 to 75 minutes. At the completion of the dibenamine administration, the vein through which it was given was flushed with from 100 to 150 c.c. of normal saline or glucose solution. This procedure was found necessary for preventing local phlebothrombosis, which otherwise frequently followed dibenamine infusion in the early stage of this investigation.

The effects of this drug were studied 69 times in 38 subjects, 18 of whom were normotensive and 20, hypertensive. Among the latter, 14 were suffering from essential hypertension and 6 from systolic hypertension associated with arteriosclerotic cardiovascular disease.

The administration of dibenamine resulted in a significant reduction of the resting blood pressure in subjects with benign or moderately advanced essential hypertension only. (These results are at variance with those presented by Hecht and Anderson.) The depressor effect started at the end of infusion and lasted for from 24 to 72 hours. Orthostatic hypotension occurred in both normotensive and hypertensive subjects.

There is ample evidence to show that dibenamine is a very potent and highly specific adrenolytic and sympatholytic agent. It probably acts directly on the effector cells, where it blocks the sympathetic impulses or the action of sympathomimetic substances (sympathin E, epinephrine). Thus the changes in blood pressure induced by dibenamine may be interpreted as being due to the blockade of sympathetic tone.

There were both local and general side reactions due to the administration of dibenamine. Local reactions included phlebothrombosis, mentioned above, and pain in the arm along the vein during the infusion, which was seen in 4 instances. Most general reactions were minor. Dryness of the mouth and congestion of the nose were seen in practically all cases. Drowsiness and transient nausea were common. The major side effects included vomiting in 8 instances, mental confusion and emotional lability in 3 cases, and one case of mental confusion with loss of sphincteric control and deep sleep lasting one hour.

All side effects were transient. A slow, even rate of infusion and confinement to bed of the patient for about 12 hours after the injection, i.e, until the orthostatic hypotension could no longer be elicited, appeared important factors in the prevention or reduction of the side effects to a minimum.

The lowering to normal levels of the resting blood pressure by dibenamine, in subjects with benign or moderately advanced essential hypertension only, tends to suggest that: (1) a neurogenic element, i. e., altered sympathetic tone is present in essential hypertension, and (2) the evaluation of this element by the administration of dibenamine may be of great help in the selection of patients when surgery is contemplated.

Because of its specific sympatholytic action, dibenamine offers a valuable tool for the investigation of the neurogenic component of a variety of vascular conditions. Further study is under way. (Proc. Soc. Exper. Biol. and Med., Feb. '48 - H. Haimovici and H. E. Medinets)

* * * * * *

Crystalline Vitamin B_{12}: A crystalline compound which in microgram quantities has produced positive hematological responses in initial tests in patients with pernicious anemia has been isolated from liver.

In 1942 research in the Merck and Company laboratories, together with collaborative clinical tests conducted by Randolph West, showed that further purification of the "anti-pernicious anemia" principle in commercial liver concentrates could be effected. Subsequently, these chemical and clinical studies were extended, and more recently Mary S. Shorb and George M. Briggs collaboratively tested certain clinically highly active fractions for growth activity of Lactobacillus lactis Dorner and found them to be active. L. lactis was found by Doctor Shorb to require two unidentified growth factors; one of them (LLD factor) appeared to be related to the activity of commercial liver preparations used in the treatment of pernicious anemia. For convenience in the testing of the fractions, use was made of an arbitrarily selected standard liver concentrate which was assigned a potency of 1,000 LLD units per mg.

Further purification of clinically active liver fractions has led to the isolation, in minute amounts, of a crystalline compound which is highly active for the growth of L. lactis. This compound is being called vitamin B_{12}. Its potency is about 11,000,000 LLD units per mg., and 0.000013 micrograms per ml. of culture medium is capable of supporting half-maximal growth under the conditions used. This potency value was found by Doctor Shorb, using a 23-hour growth period. The compound crystallizes in the form of small red needles which, after drying, show refractive indices of α, 1.616; β, 1.652; and γ, 1.664. On the micro-stage, the crystals darken to black at about from 210 to 220°, but do not liquefy below 300°.

Randolph West has tested this crystalline compound for activity in the clinical treatment of pernicious anemia in relapse. In one patient a single intramuscular dose of 150 micrograms gave a very strong hematopoietic response; in two other patients doses of 3 and 6 micrograms, respectively, produced a prompt increase in the circulating reticulocytes, red cells, and hemoglobin. These results are supported by early tests conducted by Doctor West, in which three separate concentrates, containing by microbiological assay from 2 to 5 micrograms of vitamin B_{12}, gave strongly positive responses in four patients.

The biological activity of the new vitamin is extremely high in terms of its activity in these tests on pernicious anemia. For example, using pteroylglutamic acid, hematopoietic responses have been obtained with doses of the order of from 20,000 to 50,000 micrograms during the first 10 days of treatment.

The relative contents of vitamin B_{12} in several commercial liver extracts (15 U.S.P. injectable units per ml.) for parenteral use are shown in the following table:

Source	Vitamin B_{12} content (microbiological assay)			
	LLD units/ml	µg/ml	µg/U.S.P. unit	Per cent of dry weight
Company A	72,000	6.5	0.4	0.003
Company B				
(Sample 1)	13,000	1.2	0.1	0.00055
(" 2)	19,000	1.7	0.1	.....
Company C				
(Sample 1)	154,000	14.0	0.9	0.014
(" 2)	80,000	8.0	0.5	0.0065
Company D				
(Sample 1)	29,000	2.6	0.2	0.001
(" 2)	39,000	3.5	0.2	0.0014

For liver extract one U.S.P. unit is defined as that amount required daily to produce satisfactory clinical and hematological responses in pernicious anemia. If it is assumed that this new crystalline compound is the only substance present in these preparations which is therapeutically active, it is evident that clinical response should be obtained from the parenteral administration of approximately 1 microgram of the new vitamin per day. The clinical responses obtained with single 3- and 6-microgram doses of crystalline vitamin B_{12} are not inconsistent with the approximate equivalence of 1 microgram of the vitamin and 1 U.S.P. injectable unit. It should be pointed out, however, that it is customary to administer from 20 to 60 U.S.P. units of liver extract during the first two or three days to start remission of pernicious anemia in relapse. This dose range is equivalent to not more than about from 20 to 60 micrograms of vitamin B_{12}.

Further research is in progress on the composition, structure, and biological activity of vitamin B_{12}. (Science, 16 April '48 - E. L. Rickes et al.)

* * * * * *

Aspects of Diabetes: The authors, Joslin and associates, consider that the survey to determine the prevalence of diabetes in a population group carried

out at Oxford, Massachusetts, by Wilkerson and Krall, of the U. S. Public Health Service, constitutes a major contribution to the knowledge of diabetes.

Oxford is a representative community, the age composition of the population closely paralleling that of the country as a whole. Of its 4983 inhabitants, 3516, or 70.6 percent, submitted to tests of the blood and urine for the survey. For the 40 known diabetic patients in the community prior to the survey 30 persons with unrecognized diabetes were discovered, and if all residents had been examined, the implication is that for each known there was an unknown case of diabetes. The incidence rate for diabetes based on the total population was 0.8 percent for known cases and 0.6 percent for newly discovered cases, or a total incidence rate of 1.4 percent for the 4983 inhabitants. Since 29.4 percent of the townspeople were not reached by the testing program, it is estimated that the number of previously undiscovered cases of diabetes might have risen to 47 had all the townspeople been tested. The 40 known cases in addition to these 47 estimated cases would be equivalent to 1.7 percent of the population of the town.

The ages of the newly discovered diabetic persons varied between 16 and 93 years, with a median age of 55 years, those from 45 to 64 years of age constituting nearly half the cases and more than half the new cases. In the age groups by decades from 45 years on, the percentages of diabetic patients found were surprisingly high; between 45 and 54 it was 4.6 percent, between 55 and 64 it was 5.1 percent, and between 65 and 74 it was 7.3 percent, rising above the age of 75 to 13.0 percent. If these figures were substantiated by similar figures in larger groups, diabetes would be even a greater geriatric problem than already anticipated.

The sex distribution among the 70 cases revealed 31 men and 39 women. There was a high prevalence of the disease among the French or those of French-Canadian descent. A family history of diabetes was reported by 38.6 percent of the diabetic and by 18.2 of the nondiabetic persons. Overweight was the rule. The survey showed the unreliability of the fasting blood sugar level as a means of diagnosing early diabetes and emphasized the necessity of using both blood and urine tests for diagnosis. If urinalysis alone had been employed, 8 cases would have escaped diagnosis, and if only a blood specimen had been taken, 6 cases would have escaped detection.

For the group tested in Oxford the screening level for hyperglycemia was 160 mg. per 100 c.c. for venous blood and 190 mg. per 100 c.c. for capillary blood. Persons with a blood sugar below the screening level and no glycosuria were notified that the tests revealed no laboratory evidence of diabetes. If glycosuria with or without a blood sugar above the screening level was encountered, a further test of urine and blood was given. Dextrose tolerance tests were performed if previous tests of blood and urine were not in accord or borderline or if there was persistent hyperglycemia without glycosuria or vice versa.

The early discovery of diabetes may be considered a form of preventive medicine, because it is generally agreed that in the case detected early the prognosis is favorable.

This survey is of great importance. It has set a new standard for estimates of the prevalence of diabetes. If the data obtained are duplicated and hold for the country as a whole, the implication would be that instead of 1,000,000 diabetic persons in the United States there are actually 2,000,000. The million unknown cases would on the whole be the ones most amenable to treatment, because the majority would be the mild, symptomless cases and those of recent onset, by all standards presenting the best prognosis, but at the same time probably of a lower income group, thus necessitating special provisions for treatment.

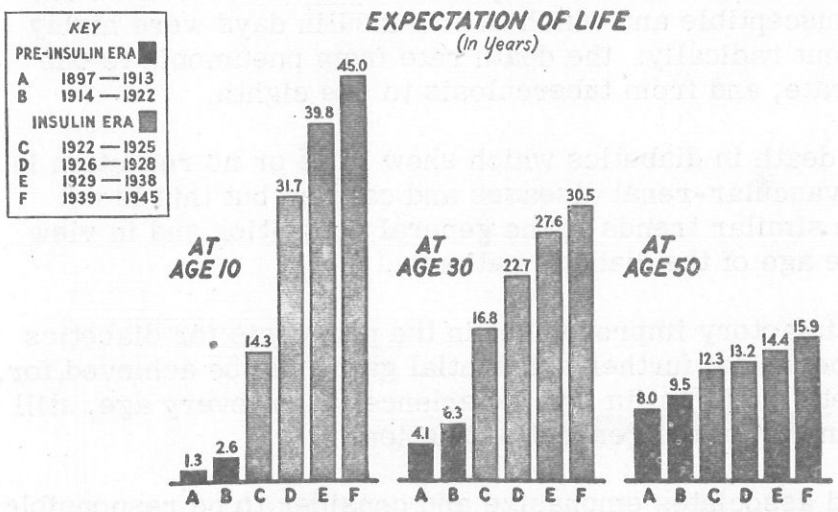
The results of treatment of the diabetic patients coming under the supervision of the author and his associates, at the George F. Baker Clinic in Boston, were recently published in the Statistical Bulletin of the Metropolitan Life Insurance Company. In each successive period of treatment for all ages there has been absolute uniformity in that the results have been steadily improving for each succeeding epoch, as shown in their table and figure below.

*Death Rates among Diabetic Patients in 1897–1945, according to Experience at George F. Baker Clinic.**

Age	Death Rates†					
	1897–1913‡	1914–1922‡	1922–1925§	1926–1928§	1929–1938§	1939–1945§
yr.	*per 100,000*	*per 100,000*	*per 100,000*	*per 100,000*	*per 100,000*	*per 100,000*
10	824.0	386.1	61.4	19.1	8.1	4.6
15	623.0	398.8	84.0	14.9	9.2	5.6
20	614.0	410.8	89.4	18.3	12.6	7.6
25	585.6	342.8	77.4	28.0	15.9	10.1
30	359.8	236.8	74.8	33.4	13.9	9.8
35	200.6	152.1	57.5	28.5	10.6	9.4
40	165.7	115.1	34.7	23.8	16.6	10.4
45	119.8	87.1	33.4	26.3	22.2	15.2
50	96.1	77.4	45.3	41.0	30.6	24.3
55	97.1	90.1	64.2	56.5	46.4	36.4
60	188.8	112.5	85.2	70.1	66.6	52.4

†Excludes deaths within one week of first observation or hospital discharge.
‡Preinsulin era.
§Insulin era.

Experience of George F. Baker Clinic, Boston Massachusetts, 1897 to 1945



Excludes deaths within one week of first observation or hospital discharge

At the younger ages these reductions were spectacular. At age 10, the death rate in the period from 1922 to 1925 was 84 percent less than in the period from 1914 to 1922. Further sharp gains have been made at every age down to the present, and as before, these have been relatively greatest at the younger ages. Even between 1929 and 1938 and 1939 and 1945, the most recent of the periods into which the data are divided for comparison, the death rate at age 10 showed a decline of 43 percent, and at most ages under 45 the reduction between these two recent periods exceeded 30 percent.

When the rates in the most recent years, from 1939 to 1945, are compared with those prevailing before insulin, the revolution in the outlook for diabetics is even more sharply defined. At age 10, the recent rate is 99 percent less than from 1914 to 1922. Reductions of 95 percent or more are found at all ages up to 30 and of from 90 percent to 95 percent at ages from 30 to 40. Even at age 60, the rate from 1939 to 1945 was 53 percent less than from 1914 to 1922.

Prior to 1914, the average 10-year-old diabetic child lived a little more than a year, and from 1914 to 1922 the expectation of life at age 10 was only a little higher - about 2 and 1/2 years. The first years of insulin, from 1922 to 1925, saw a gain of nearly 12 years, and marked increases have been recorded in every successive period. Even the most recent period, from 1939 to 1945, shows a gain of a little more than 5 years in the expectation of life at this age over the period from 1929 to 1938. Today, the average diabetic child of 10 with an expectation of life of 45 years may expect to reach his 55th birthday.

Analysis of the causes of death among diabetics in this experience shows further what insulin and other advances in the treatment of diabetes have accomplished. Before insulin, diabetic coma snuffed out the lives of practically every diabetic child and of many diabetic adults. The death rate in recent years from this cause is 99 percent less than in pre-insulin days. The mortality from gangrene, which was a frequent cause of death of diabetics in earlier years, has been reduced nearly 60 percent. The mortality from infections, to which diabetics are particularly susceptible and which in pre-insulin days were highly fatal, has likewise been cut radically: the death rate from pneumonia to one sixth of the pre-insulin rate, and from tuberculosis to one eighth.

The chief causes of death in diabetics which show little or no reduction in mortality are the cardiovascular-renal diseases and cancer, but this is not surprising in view of the similar trends in the general population and in view of the increasing average age of the diabetic patients.

Despite the very satisfactory improvement in the prognosis for diabetics demonstrated by this experience, further substantial gains can be achieved, for, the length of life of diabetic patients (in this experience) is, at every age, still about one fourth less than that of the general population.

What the author and associates emphasize and consider to be responsible for the improvement in mortality of their patients with coma during the last

seven years is the attitude that every patient with diabetic acidosis and coma constitutes a grave emergency and that such a patient needs intensive study: (1) to determine the diagnosis and especially to determine the complications present; (2) to determine immediately the amount of insulin needed and to give that dose as promptly as possible. Occasional, profoundly unconscious patients may need from 500 to 1000 units, and if any less than this dose is given in the first few hours, delay occurs at a time when it is most dangerous. Those who adopt automatic rules by which a patient gets 50 units every 30 minutes may find in the occasional very severe case that in the first 2 or 3 hours only a comparatively small amount of insulin has been given and during that time the patient has lost ground.

The striking improvement in the mortality rate of profoundly unconscious patients at the Deaconess Hospital has been due to willingness to give 500 or 1000 units, or even more, in the first two hours of treatment when it is necessary. Whereas 35 percent of the profoundly unconscious patients died in the period before 1940, since 1940 only 10 percent have died. Everyone knows that the mortality in the profoundly unconscious patient is higher than that in patients who are not yet completely unconscious. Other workers report a mortality of 64.6 percent in 55 patients in coma who were profoundly unconscious. When they omitted from their series unconscious patients whose deaths were due to complications other than coma, they still had a mortality of 48.8 percent. Another striking fact brought out in the same report had to do with the use of sodium lactate. Patients who received sodium lactate showed a mortality of 8.5 percent for those 12 hours in coma, 66.6 percent for those in coma from 12 to 24 hours, and 50 percent for those in coma for 24 hours. Patients treated without sodium lactate showed a mortality of 9.1 percent for those 12 hours in coma, 22.2 percent for those in coma from 12 to 24 hours and 66.6 percent for 3 patients in coma for 24 hours. Little advantage, then, was obtained by the use of sodium lactate. They also described 2 cases of diabetic acidosis associated with a decrease in the serum potassium concentration, with recovery in one.

In the treatment for diabetic acidosis of 96 children, two workers made use of sodium lactate to raise the blood carbon dioxide. The method is summarized by the statement that insulin is immediately administered in amounts of 2 units per kilogram of body weight, and 30 c.c. of sixth-molar sodium lactate solution per kilogram of body weight is given intravenously. At the same time 40 c.c. of hypotonic Ringer's solution per kilogram and 30 c.c. of sixth-molar sodium lactate per kilogram of body weight are given subcutaneously. Six hours later approximately 0.5 unit of insulin per kilogram is administered, and, if necessary, sixth-molar sodium lactate is given subcutaneously and plasma, concentrated albumin, or whole blood, as required. Five of the 96 children died, although acidosis was relieved before exitus.

Shock may occur with coronary occlusion, as in one fatal case with a fall in the blood carbon dioxide to 20 vol. percent but with no acetone bodies in the blood. Differential diagnosis is therefore important. This might have been thought to be a death from diabetic coma if there had not been quantitative measurement of the acetone bodies in the blood, which showed less than 2 mg. total acetone bodies per 100 c.c. (New England J. Med., 18 March '48)

Syphilitic Relapse vs. Reinfection: There is today no unanimity among syphilologists regarding the criteria for differentiation between syphilitic relapse and reinfection. Since relapse comprises absolute evidence of failure of the treatment given, and since reinfection is believed by many syphilologists to indicate cure of the original infection, evaluation of the therapeutic efficacy of new methods of treatment requires differentiation between these two entities.

The authors are in agreement with Schoch and Alexander that, currently, the most valid criteria of syphilitic reinfection in patients who have been treated for early infectious syphilis are as follows:

1. Serologic course. Appearance of a darkfield-positive lesion morphologically compatible with a chancre while the patient is seronegative or while the serologic titer is declining, with development of seropositivity or an upward swing of the titer following the appearance of the lesion. Serologic relapse usually precedes infectious relapse. This standard, however, is applicable only to patients seen at frequent intervals after treatment and who present themselves soon after the appearance of a primary lesion.

2. Response to re-treatment. In order to simplify the comparison of response to therapy, the patient should, ideally, be re-treated for a second infectious episode by the same treatment scheme that was used for the first infection. It would be expected that an identical, repeated course of treatment would again fail to cure in true infectious relapse.

3. Epidemiologic evidence. Sexual exposure to a person with infectious syphilitic lesions is followed after the proper incubation period by a darkfield-positive lesion.

4. Adequacy of treatment of preceding episode. An effective treatment schedule makes relapse less likely, and therefore suggests reinfection. However, when an infectious syphilitic episode follows a small amount of therapy, relapse is the more likely cause, reinfection less likely.

The utilization of the serologic course as a criterion demands frequent quantitative tests in a single laboratory, the procedures of which are subject to minimal technical variations. The failure of many patients to return for frequent and regular posttreatment observations and the variability in sensitivity of tests used by many laboratories limit the value of this method. Epidemiologic investigation depends, of course, primarily on the history obtained from the patient and his contact and is, therefore, liable to errors. It becomes apparent then that these aids may not be available or sufficiently detailed in each case. However, when reinfection is suspected, the result of re-treatment with the same amount of penicillin is indeed helpful in making the diagnosis if adequate posttreatment follow-up is carried out. The authors believe that re-treatment with identical amounts of penicillin should be utilized more frequently as a method of differentiating relapse from reinfection.

In studying an individual patient, each of these criteria must be weighed and evaluated in relation to the others. The diagnosis of relapse or of reinfection demands positive evidence, and in the absence of specific data such as those outlined above, no differentiation should be attempted. When differentiation is impossible because of inadequate data, the term "infectious syphilitic episode" is proposed rather than "treatment failure," which states that the treatment has failed.

This study is based on the records of patients treated at the Institute for the Study of Venereal Disease of the University of Pennsylvania and at the Baltimore Rapid Treatment Center. The lesions of all patients were dark-field-positive for Treponema pallidum on each admission to the hospital for treatment and re-treatment.

Multiple reinfection in marital partners has been aptly termed "ping-pong syphilis" by Schoch. The infection is batted back and forth like a ping-pong ball, from the infectious partner to the partner who has just completed treatment. Ping-pong syphilis is a phenomenon peculiar to short-term therapy. The marital partner of a person undergoing prolonged treatment usually becomes noninfectious by virtue of time alone before the patient emerges from the chemical protection of treatment.

There are many social and psychological elements which are conducive to reinfection. All too often patients are inadequately instructed regarding the dangers of reinfection, and others cannot or will not accept the advice given.

Although penicillin is a relatively harmless drug, it has recently been shown by Pillsbury, Steiger, and Gibson that the incidence of reactions to the drug increases with repeated courses.

Another danger in misinterpreting reinfection as relapse is that it may lead to dangerous and costly measures to supplement treatment. In one case of ping-pong syphilis in a husband following his second "failure" to become cured, it was suggested by members of the staff that fever therapy and prolonged arsenoxide treatment be added to penicillin in his third course of treatment, on the basis that since he had relapsed twice after 9,600,000 units of penicillin, there was no point in giving this amount a third time. However, when reinfection was considered (and subsequently confirmed) as an explanation of the patient's multiple infectious syphilitic episodes, this supplementary treatment was avoided.

Prevention of reinfection of the spouse following intensive therapy might be accomplished in a number of ways:

1. More intensive and speedy epidemiologic investigation.
2. Intensification of education during the hospitalization period in an effort to prevent or minimize posttreatment exposures.

3. Quarantine of the patient in the hospital following treatment until the spouse has passed through the incubation period. When feasible, hospitalization of the spouse, if found infected, before the patient is released.

4. Ambulatory arsenotherapy of a married person with early syphilis until it can be determined whether or not the marital partner has been infected. If both are infected, treat with penicillin simultaneously.

5. When exposure of the marital partner has been such as to render infection highly probable, simultaneous treatment of both partners might be considered in spite of the fact that one is still undiagnosed. This is especially applicable when the family lives in an area remote from specialized medical service. (J. VD Information, April '48 - I. L. Schamberg and H. P. Steiger)

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Rapid Treatment of Early Syphilis - Progress Report, December 1947: This report is the ninth in a continuing series of progress reports evaluating the effectiveness of various forms of rapid therapy for early syphilis. Treatment and follow-up data have been furnished by 50 State and locally sponsored rapid treatment centers.

The present report is limited to schedules utilizing penicillin, either alone or combined with arsenoxide, with arsenoxide and bismuth, or with fever therapy, and includes seven schedules not previously shown.

Results of therapy at from 12 to 15 months after treatment for 22 schedules utilizing penicillin for previously untreated secondary syphilis are presented in the table on the opposite page. At least 50 patients in each schedule were observed for as long as the period of time shown. Results of therapy are measured by cumulative percentage of cases re-treated (including reinfection, clinical relapse, and serorelapse or resistance) and by percentage of patients attaining seronegativity.

As can be seen from the table, the schedule with the lowest cumulative re-treatment rate (4.3 percent) and the highest rate of seronegativity (80.8 percent) is the schedule employing 3,400,000 units of aqueous penicillin given in injections of 40,000 units at 2-hour intervals. The re-treatment rate for this schedule is not only lower than for any other schedule, but is significantly lower than for all but two of the other schedules shown. It perhaps should be pointed out that the patients included in this schedule were treated at one institution and are composed primarily of young white males. The addition of cases from other centers in future reports may alter the present excellent results.

The highest re-treatment rate (52.1 percent) and the lowest rate of seronegativity (37.2 percent) are observed in the 1-day intravenous drip schedule employing from 10,000,000 to 25,000,000 units of penicillin.

Schedules utilizing aqueous penicillin alone in amounts ranging from 1,200,000 to 2,800,000 units and varying in total duration from 4 to 14 days

Schedule of therapy	Total cases observed for 12–15 months	Cumulative percent re-treated	Not re-treated			
			Seropositive		Seronegative	
			Number	Percent	Number	Percent
Penicillin (aqueous) only:						
600,000 u., 10,000 every 3 hrs	197	32.9	25	12.7	107	54.3
1,200,000 u., 20,000 every 3 hrs	135	25.4	16	11.8	85	62.9
1,200,000 u., 40,000 every 3 hrs	148	22.4	14	9.4	101	68.0
1,200,000 u., 40,000 every 6 hrs	326	23.2	63	19.3	187	57.4
1,600,000 u., 20,000 every 3 hrs	211	21.4	51	24.2	115	54.5
1,700,000 u., 20,000 every 2 hrs	53	19.1	11	20.7	32	60.3
2,400,000 u., 40,000 every 3 hrs	338	19.2	54	16.0	218	64.5
2,400,000 u., 80,000 every 3 hrs	179	20.6	32	17.9	110	61.5
2,800,000 u., 25,000 every 3 hrs	80	21.0	11	13.8	52	65.1
3,400,000 u., 40,000 every 2 hrs	61	4.3	9	14.8	49	80.8
10,000,000–25,000,000 u., 1-day intravenous drip	75	52.1	8	10.6	28	37.2
Penicillin (peanut oil and beeswax):						
4,800,000 u., 300,000 twice daily	86	11.4	17	19.8	59	68.8
4,800,000 u., 600,000 every 24 hrs	199	16.5	29	14.6	137	69.0
Penicillin and arsenoxide:						
1,200,000 u., 20,000 every 3 hrs., 320 mg. arsenoxide, 40 mg. each day (8–12–0)	462	16.9	70	15.2	314	68.0
1,200,000 u., 16,667 every 3 hrs.; 1 mg./kg., max. 60 mg. arsenoxide on 1st, 3rd, 5th, 7th, and 9th days (5–12–0)	310	15.6	78	25.2	184	59.4
Penicillin, arsenoxide, and bismuth:						
600,000 u., 10,000 every 3 hrs.; 1 mg./kg., max. 60 mg. arsenoxide on each of 8 days; 200 mg. bismuth on 1st, 5th, and 8th days (8–6–3)	841	17.7	229	27.2	462	54.9
1,200,000 u., 16,667 every 3 hrs.; 1 mg./kg., max. 60 mg. arsenoxide on 1st, 3rd, 5th, 7th, and 9th days; 200 mg. bismuth on 1st, 5th, and 9th days (5–12–3)	1,237	14.5	354	28.6	705	57.0
1,800,000 u., 16,667 every 2 hrs.; 1 mg./kg., max. 60 mg. arsenoxide on 1st, 3rd, 5th, 7th, and 9th days; 200 mg. bismuth on 1st, 5th, and 9th days (5–18–3)	103	16.5	22	21.4	64	62.1
2,800,000 u., 25,000 every 3 hrs.; 1 mg./kg., max. 60 mg. arsenoxide on 1st, 4th, 7th, 10th, and 13th days; 200 mg. bismuth on 1st, 7th, and 13th days (5–28–3)	248	15.6	35	14.1	174	70.1
Penicillin and fever therapy:						
1,200,000 u. in 28–30 hrs.; 6 hrs. of fever sustained at 106° F.	84	25.8	11	13.1	51	61.0
2,400,000 u. in 28–30 hrs.; 6 hrs. of fever sustained at 106° F.	51	35.6	6	11.7	27	52.6
2,400,000 u., 40,000 every 3 hrs.; 3 sessions of fever of 3 hrs. each	57	14.7	4	7.0	45	78.4

NOTE: The statistical method used in this evaluation is based on the assumption that cases which lapsed from observation will have the same experience as those which remained under observation.

show re-treatment rates ranging from 19.1 to 25.4 percent (average, 21.6 percent). When arsenoxide is given in conjunction with the penicillin (with or without bismuth) re-treatment rates are consistently lower, ranging from 14.5 to 17.7 percent (average, 15.9 percent).

Unfortunately, no valid comparisons can be made between aqueous penicillin and penicillin in oil-beeswax because of the difference in the total number of units administered. However, the second lowest cumulative re-treatment rate (11.4 percent) among all schedules is observed in patients treated with 4,800,000 units of penicillin in oil-beeswax administered in injections of 300,000 units twice daily. When the same total amount of penicillin is given in single daily injections of 600,000 units, the re-treatment rate is 16.5 percent. The difference between the two is not statistically significant. The combined rate for these two schedules (15.1 percent) is approximately the same as the combined rate for schedules employing arsenoxide in conjunction with aqueous penicillin (15.9 percent).

One of the most interesting observations in this comparison of treatment schedules is the poor results attained in schedules in which the total amount of penicillin was administered in 30 hours or less, that is, 1,200,000 or 2,400,000 units in from 28 to 30 hours plus 6 hours of fever therapy, and from 10,000,000 to 25,000,000 units by 1-day intravenous drip. This finding is substantiated by a

comparison of the two schedules employing 2,400,000 units of penicillin in conjunction with fever therapy. In one, the penicillin was administered in from 28 to 30 hours; in the other, the total duration of treatment was 8 days. The re-treatment rates for the two schedules are 35.6 and 14.7 percent, respectively, and the percentage of patients attaining seronegativity, 52.6 and 78.4 percent, respectively. Although the number of cases in each group is small (51 and 57), the differences are statistically significant. As observed in previous reports, little or no difference is noted in 4-day and 8-day schedules when the total amount of penicillin is constant. It would appear, therefore, that there is a point between 30 hours and 4 days below which it is not safe to reduce the duration of penicillin therapy.

Severe reactions and deaths were reported by 36 rapid treatment centers from July 1946 through November 1947, as shown in the table below; the reports included only those schedules which employ aqueous sodium penicillin and penicillin in oil-beeswax, with and without arsenoxide. Reaction rates applied to all cases treated, regardless of diagnosis. Severe reactions included temperature above 104° F., exfoliative dermatitis, hemorrhagic encephalitis, and other reactions which, in the opinion of the medical officer, were severe.

Type of treatment	Total cases treated	Severe reactions		Number of treatment deaths
		Number	Rate per 1,000	
Aqueous penicillin	32,719	206	6.3	0
Penicillin in oil-beeswax	11,015	34	3.1	0
Aqueous penicillin with arsenoxide	88,202	1,402	15.9	15
Penicillin in oil-beeswax with arsenoxide	30,342	230	7.6	1
Total	162,278	1,872	11.5	16

The relative safety of schedules using penicillin alone as compared with schedules combining arsenoxide with penicillin is shown by the figures in the table.

Hemorrhagic encephalitis was the principal cause of death among those treatment methods utilizing arsenoxide combined with penicillin. (J. VD Information, April '48 - J. R. Heller et al.)

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Observations on the Treatment of Malaria with Chloroquine (SN 7618) and Combined Quinine and Plasmochin: From 1 July 1946 to 1 July 1947, 125 patients with proved malaria due to Plasmodium vivax, all of Pacific origin, were admitted to the Veterans Administration Hospital, West Roxbury, Massachusetts. All had received suppressive quinacrine therapy while stationed in malarial zones, and most had been given various doses of quinacrine for prior clinical attacks. Once a positive smear had been obtained, either of two methods of treatment was offered. Those who desired as short a period of hospitalization as possible were treated with chloroquine diphosphate. The dosage was 1.0 Gm. (4 tablets, each containing 0.25 Gm. of the diphosphate) followed in 8 hours by 0.5 Gm. (2 tablets). A single dose of 0.5 Gm. was administered on the second and third days of treatment. Most patients were discharged on that day, with instructions to take 0.5 Gm. (2 tablets) every Sunday for 5 weeks. Out-patient

follow-up physical examinations with smears for malarial parasites and an extensive symptomatic history were obtained every 2 months. If an unusual clinical finding such as a positive serologic test had been noted, the checkups were made on a monthly basis.

Patients who complained of over 5 recurrent attacks of malaria and those who were able to spend 2 weeks in the hospital were placed on the combined quinine-plasmochin regimen as outlined by Most et al. Plasmochin naphthoate, in 0.02-Gm. doses, was administered every 8 hours for 14 days. Quinine sulfate was prescribed in 1.0-Gm. doses every 8 hours for one day followed by 0.6 Gm. every 8 hours for 13 days. Repeated urinalyses, blood counts, and electrocardiograms were employed to detect any evidence of toxic reactions to the drugs. The medications were given simultaneously. Fluids were forced during the acute relapse, ferrous sulfate was prescribed when any significant anemia was detected on admission, and the patients were restricted to no greater activity than a short walk to the dining hall or bathroom. Follow-up examination was identical with that described for patients treated with chloroquine.

Eighty-nine patients were followed for a period of from 6 to 12 months, and the remainder for from one to 6 months. Striking differences between the results of the two treatments were noted. (Because a veteran may receive greater compensation if a greater relapse rate is indicated, the relapses were divided into proved or laboratory relapses and symptomatic relapses with negative smears.)

Twenty-six patients received chloroquine therapy. Within 3 months 9 had experienced repeated symptoms of an acute relapse associated with a positive smear for P. vivax. One patient relapsed 7, and one 9 months after completion of this course of therapy. Ten patients were subsequently treated with quinine and plasmochin. The eleventh, a physician, experienced repeated relapses at periods of from 3 to 5 months, with an increasing interval between relapses. An additional 11 patients complained of slight fever and other minor symptoms suggestive of relapse, but self-medication with quinacrine was taken and subsequent smears were negative. The total failure rate of 84 percent and laboratory rate of 42 percent were essentially the same as those obtained with quinacrine. No toxic symptoms from the use of chloroquine were noted. Its effect on the acute relapse was as prompt as that of quinacrine. It was more pleasant for the patient to take, because it neither produced gastro-intestinal irritation nor discolored the skin. No definite relapses occurred during the 5-week period of suppressive therapy, although patients stated that they felt sick every Saturday, just before taking the weekly suppressive dose.

Sixty-three patients treated with the combined quinine and plasmochin regime were followed for from 6 to 12 months after completion of therapy. No case of a laboratory relapse occurred. Sixteen patients stated that they had experienced symptoms, which they interpreted as an attack of malaria - a symptomatic relapse rate of 26 percent. One of these had persistent splenomegaly; 6 were subsequently admitted to the hospital for "malarial attacks,"

and negative smears were obtained. In some cases adequate cause for the fever was found in infection of the urinary or respiratory tracts, and the remainder were afebrile. No laboratory relapses occurred in an additional 40 patients followed for less than 6 months. All patients stated that they noted great improvement in their sense of well-being.

The toxic manifestations of plasmochin were not serious or severe. The principal toxic symptoms or signs observed were from mild to severe epigastric burning, abdominal cramps, and diarrhea. These symptoms most commonly occurred during and after the fifth day of therapy. Abdominal pain was severe enough in 2 cases to necessitate discontinuance of the medication for several doses before the treatment could be continued to completion. There was no relation of the severity of the gastro-intestinal symptoms to other manifestations of toxicity. Roentgenographic studies in several cases during this period of discomfort failed to reveal any gastric hyperperistalsis or intestinal spasm.

Circulatory signs and symptoms consisted of the appearance or disappearance of ventricular extrasystoles concurrently with the administration of the drug in one case. Cyanosis was rarely observed, as was the central-nervous-system symptom of "nervousness." No evidence of any hemolytic anemia was encountered. It should be emphasized, however, that only white patients were treated and that they were kept on restricted activity.

The usual symptoms of quinine toxicity, namely, tinnitus, fullness in the head and ears and headache, were noted in minor degree and caused no interruption of therapy. One patient who gave a history of hypersensitivity to quinine was uneventfully treated with chloroquine.

The experience of the authors indicates that chloroquine is easier to administer to the patient; it does not have the yellow-dye discoloration effect of quinacrine. Clinically, it was no more effective in preventing relapses than is quinacrine. The combined quinine and plasmochin regime has proved as effective in reducing the relapse rate over a prolonged follow-up period as Most et al. found it to be. It is expensive and takes time, and yet is effective in returning the nonworking patient to gainful employment. Under controlled observation no toxic manifestations of importance occurred. The abdominal cramps seemed to be relieved best by rest. Sedatives and antispasmodics were ineffective. The combination is not recommended except under controlled observation and restricted activity.

All the patients with the proved cases of recurrent malaria admitted to the hospital, with the exception of two who had been stationed in the China and India-Burma theaters, came from the Pacific area - New Guinea and adjacent islands, the Solomons, Netherlands East Indies, Philippine Islands and Okinawa. No patients from the Mediterranean or Caribbean theater were encountered. This is of diagnostic importance, because many patients from the latter theaters have been referred to the hospital with the erroneous diagnosis of malaria. The authors continue to see patients who were last in a malarial zone a year and a half ago, entering with their primary delayed malarial attack. Many had lacked their usual sense of well-being since they returned from overseas and may have experienced slight attacks in the interim. Almost without exception these cases

have not been recognized as malaria by physicians, and the patients were admitted to the hospital with diagnoses of fever of unknown origin or pneumonia. No cause for the lighting up of these dormant infections was elicited. The prophesied subsidence of the attacks of malaria of Pacific origin after three or four years is being borne out by a diminishing admission rate. The bulk of those who contracted the disease in 1942 or 1943 are no longer experiencing symptoms that can be proved to be due to malaria. (New England J. Med., 1 April '48 - T. A. Warthin et al.)

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Contamination of Oxygen Cylinders: Navy Department Circular Letter 48-271, Navy Department Bulletin of 15 April 1948, contains information important to Medical Department personnel concerning presently contaminated oxygen tanks and procedures for safeguarding against future contamination of other cylinders. See page 34 for copy of this letter.

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Opportunities for Research: Opportunities to engage in research in the Navy are offered to interested medical and dental officers. See Circular Letter 48-46, page 30.

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Safety Precautions with Explosive Anesthetic Gases: BuMed Circular Letter 48-45 on page 28 contains information of importance and general interest to a wide range of personnel of the Medical Department.

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Good Morale: Good morale grows from the individual's happiness and contentment in his immediate job. It is stimulated by his understanding and appreciation of the importance of his role and purpose in the organization. Good morale grows, too, when an individual feels that his employer believes in him and is using his ability to the best advantage. On the other hand, poor morale results from an employer's indifference (often unintentional) to those working for him, in not using the individual to the best of his ability or in not recognizing and appreciating the efforts put forth by him. Good morale in an organization means good business, and all successful business houses point with pride to the high morale in their institutions.

The Navy's Medical Department is a big business organization, with many branches in the field. What is being done to help its personnel - civilian and Service officers and enlisted - to do a good job? Are they being helped? Is each individual being used to the best of his ability? Is he being made to feel that he is a vital cog in the organization and that his contribution is important? Is the morale in the department being kept at a high level?

The responsibility for good morale begins at the top and spreads downward, with the obligation to develop good morale and maintain it resting on everyone in the chain as part of his regular duties.

There will be no better time than now to take inventory, analyze the organization, and effect remedies where indicated. (Public Relations Div., BuMed)

Circular Letter 48-45 19 April 1948

To: All Medical Department Activities

Subj: Safety Precautions in Surgical Operating Rooms Against Explosive Anesthetic Gases, BuMed Policy Regarding

1. The attention of all activities under the management control of BuMed having major surgical operating rooms employing gaseous anesthetic agents is directed to the following.

2. The essential precautionary measures against fires and explosions caused by volatile anesthetic agents including ether, ethylene, cyclopropane, propylene, ethylene chloride or the combination of nitrous oxide or oxygen, (which are supporters of combustion), in operating rooms are herewith summarized for information:

(a) All operating room decks, including a minimum of fifteen feet of approach deck, shall be electrically conductive and of so-called spark-proof composition. The deck may be of marble, terrazzo, or tile, with grounded brass grids of not more than six-inch squares. Special conductive-type composition, linoleum, rubber, or asphalt deck covering may also be used. All types shall provide an uninterrupted low resistance path to ground. All borders of the deck shall have a continuous bonded strip well connected to the ground.

(b) All electrical wiring, outlets, switches and other fixtures shall be of explosion-proof types (except major surgical light).

(c) Until such time as specifications can be prepared relative to the specific requirement for major surgical operating lights, one of the following "approved" lights should be used:

1. Wilmot Castle #12
2. American Sterilizer Co. "Luminaire"
3. Westinghouse Co. "Scialytic"
4. Scanlon - Morris Co. "Operay"
5. Helophane Co. "Multiple Control System"

Major surgical operating lights of other manufacturers will be added to this list from time to time as they are proved to meet the requirements and specifications.

(d) Complete air conditioning without recirculation within the room to any other part of the hospital; including control of temperature, and humidity, with adequate volume to dilute the explosive agent. Entrance of

conditioned air shall be at ceiling level and exhaust of contaminated air shall be at floor level.

(e) Complete grounding of all electrical equipment, including head lamps, machines--fixed and portable, illuminating lights, instruments and appliances. This is necessary to prevent development of sparks, either static or power which are generally conceded to be the major causes of anesthetic gas fires and explosions.

(f) All electrical equipment such as anesthetic apparatus, bronchoscopes, laryngoscope, x-ray, fluoroscope, other endoscopic examination instruments, power knives, sewing machines, power-driven bone tools, proctoscopic electrosurgical apparatus, suction pumps, portable surgical lights, fans, diathermy, and emergency lights of explosion-proof types, if properly grounded, can be used safely. Polarized receptacles and plugs will provide additional safeguards against the connection of unauthorized equipment.

(g) If an electric cautery, open spark, or open flame is to be used the patient should be thoroughly evacuated of residual explosive inhalant, if practicable, before the use of these devices, or an efficient barrier should be erected between the face of the patient and the operating field. The use of a cautery, spark, or flame in the presence of an explosive anesthetic agent is considered highly dangerous.

(h) All persons in the operating room should wear shoes with conductive soles and heels, and socks or stockings shall be of cotton when highly explosive gas is being used. Other materials would interrupt the low resistance path to ground.

(i) It is recommended that a floor test plate for testing conductivity of footwear be set up near the entrance to the operating room suite. Only personnel wearing proven conductive footwear should be allowed to enter the operating room suite.

(j) Rubber bags, bellows, tubes, rubber blankets and operating table pads should be of conductive rubber.

(k) Only cotton blankets should be used in operating and delivery rooms. Wool blankets, when drawn over other material, generate static electricity, and the spark necessary for ignition of gases, could be produced.

(l) It is dangerous to wear silk, wool, rayon, or sharkskin clothing by any person in the operating room, when highly explosive gas is being used.

(m) Patient should be grounded to the operating table.

(n) A 4-pound CO_2 hand fire extinguisher shall be provided for each room in the operating suite. The extinguisher shall be strategically placed and shall be readily accessible in case of an emergency.

(o) A sign shall be displayed outside the entrance to the operating suite when explosive gas is being used, reading

"DANGER - EXPLOSIVE GAS
BEING USED - NO SMOKING
OR OPEN FLAME PERMITTED
IN THIS AREA."

3. Projects of the activities under the management control of BuMed for accomplishing the installation or alteration of Operating Rooms to comply with the above standards should be processed in accordance with BuMed Circular Letter No. 45-154 dated 16 June 1945. Attention is invited to the Secretary of the Navy's letter SecNav Ser. 1306/N610/CP:lhp, dated 14 October 1947, which states in part: "Authority to approve projects costing less than $20,000 for minor construction and alterations, within the limitations of Section 26, Public Law 604, 79th Congress, is hereby delegated to Chiefs of the various Bureaus and Commandant, Marine Corps." Submission of these projects is requested at the earliest possible date for accomplishment.

4. The cotton blankets required for use in operating rooms should be purchased locally. Because of the limited demand they will not be added to the supply table. The conductive shoes are now in the research stage of development and information relative to procurement will be published at a later date.

5. The observance of the precautionary measures set forth herein materially reduces the dangers of fire and explosions in operating rooms and at the same time will permit the operating surgeon an unrestricted choice of the anesthetic most efficacious for the various surgical procedures.

6. It is the intent of the Bureau of Medicine and Surgery that all operating rooms under its cognizance shall be made as safe as possible by taking advantage of such measures as modern research and science may indicate to the end that fires and explosions therein may be prevented.

--BuMed. C. A. Swanson

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Circular Letter 48-46 26 April 1948

To: All Medical Department Activities

Subj: Medical Research in the Navy, Opportunities for Medical and Dental Officers to Engage in.

1. Since 1941 when the Research Division was established in the Bureau of Medicine and Surgery, research has become an important function of the Medical Department. Excellent facilities are now available for research in the basic biological sciences; experimental medicine and surgery; dentistry; preventive and tropical medicine; aviation medicine; submarine and diving medicine; field or combat medicine; and the preventive medicine aspects of chemical and atomic warfare.

2. Active participation in research by medical and dental officers is essential for the effective prosecution of most of the research programs. There is an urgent need in our research activities for medical and dental officers interested in research and it is requested that this need be made known within the Medical and Dental Corps.

3. The Bureau will make every effort to place applicants for specialization in research in appropriate research activities for basic training, to further their advancement by postgraduate training in civilian institutions, and to afford those who so desire a continuous career in research.

4. It is desired that medical and dental officers with special aptitude, training, experience or inclination for research, apply for duty in research stating their special qualifications and field of interest.

--BuMed. C. A. Swanson

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Circular Letter 48-47 27 April 1948

To: Ships and Naval Dispensaries (major), Extra-Continental

Subj: Pharmacy Services

Encl: 1. (HW) Questionnaire to be completed (Parts I, II, III, & IV).

This letter requests that addressees furnish the Bureau with certain information which will be used in evaluating the present status of pharmacy so that plans may be developed to insure the best possible pharmaceutical support of medical services.

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Circular Letter 48-48 28 April 1948

To: Commandants, All Naval Districts and River Commands

Subj: Civil Death Certificates - Procurement and Payment for

Refs: (a) Comptroller General ltr, A-39800 dated 17 December 1931 to the Secretary of the Navy

Refs: (b) Paragraph 3411, Manual of the Medical Department
(c) Paragraph 56308, BuSandA Manual

Occasionally in cases of death of Naval personnel occurring in civilian jurisdictions, death certificates prepared by the cognizant civilian authorities are required for the official use of the Navy Department. This circular letter contains instructions concerning the procurement of and payment for such death certificates.

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Circular Letter 48-49 29 April 1948

To: All Ships and Stations

Subj: Serum Albumin and Plasma; Extension of Potency Period for

Refs: (a) ALNAV 33 of 8 February 1945
(b) ALNAV 162 of 17 July 1945
(c) ALNAV 336 of 12 October 1945
(d) ALNAV 592 of 14 November 1946

1. References (a) and (b) are hereby cancelled and superseded by this letter.

2. The National Institute of Health now allows a seven (7) year dating period for 1-582-010, Albumin, Serum, Human, 25 Gm., 100 c.c.; 1-582-045, Albumin, Serum, Human, Salt Poor, 25 Gm., 100 c.c.; and 1-607-104, Plasma, Normal, Human, Dried, 500 c.c.

3. All Serum Albumin now in stock which has a manufacturer's labeled expiration date ending any time in the calendar years 1945, 1946, or 1947, shall be extended four (4) years from the date shown on the package. All other expiration dates for Serum Albumin shall be advanced two (2) years.

4. All Plasma, Dried, now in stock, which has a manufacturer's labeled expiration date of 1945 or earlier shall be extended four (4) years from the date appearing on the package. All other expiration dates for Plasma, Dried, shall be advanced two (2) years.

5. The dating period of the above three items may eventually extend beyond seven (7) years, therefore, none of these items shall be discarded without first obtaining instructions from the Bureau of Medicine and Surgery.

6. The provisions of references (c) and (d) remain in effect.

Approved 28 April 1948 --BuMed. H. L. Pugh
JOHN NICHOLAS BROWN
Acting Secretary of the Navy

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Op24B/cj, Serial 136P24 30 March 1948

To: All Ships and Stations

Subj: Establishment of U. S. Naval Medical Material Office, Brooklyn, N. Y.

1. The following activity is hereby established, under a medical officer in command:

U. S. Naval Medical Material Office
Sands and Pearl Streets
Brooklyn 1, New York 4177-025

This activity is under the military command and coordination control of the Commandant, Third Naval District, and is under the management control of the Bureau of Medicine and Surgery.

2. Bureaus and offices concerned take necessary action.

--SecNav. W. John Kenney

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JAG:I:FXD:jz 12 April 1948

To: All Ships and Stations

Subj: Promotion Procedure - Compliance With Chapter XII, Naval Courts and Boards

Ref: (a) BuPers Circ. Ltr. 248-47; N. D. Bul. of 31 Dec. 1947, 47-1198.

1. The attention of the commands listed in reference (a) is invited to chapter XII, Naval Courts and Boards. All promotions now require a report of a board of medical examiners. In some instances of recent promotions, attempts have been made to qualify officers without compliance with the provisions of chapter XII, Naval Courts and Boards. This created addítional clerical work and resulted in delays in effecting the promotions.

2. In order to avoid additional clerical work and these delays, compliance with chapter XII, Naval Courts and Boards, is requested.

--JAG. O. S. Colclough

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JC10(646a), EN28/A2-11 9 April 1948

To: All Ships and Stations

Subj: Contamination of Oxygen Cylinders

Refs: (a) BuShips Manual, chs. 23 and 92.
(b) Bureau of Ships Interim Specification 51G2INT.
(c) Navy Department Specification 51G3.

1. The Bureau has been advised by a Navy cylinder-charging activity that oxygen cylinders, as received for recharging, at times contained appreciable quantities of acetylene gas.

2. The admixture of acetylene with the residual oxygen in certain of the cylinders was determined as ranging up to 5.8 percent by volume. With respect to the source of the acetylene, traces of acetone were found, indicating that the gas was originally charged into standard acetylene cylinders.

3. Particular attention is invited to the extremely hazardous nature of the conditions described in the foregoing:

(a) For instance, aviators' breathing-type oxygen cylinders were found among those contaminated with acetylene; and although these cylinders receive special attention in charging plants, and each one is tested and inspected individually, the result of any mischance whereby contaminated oxygen cylinders were placed in aviation service could be extremely serious.

(b) Both aviators' breathing and technical-type oxygen cylinders are used as a source of supply for medical oxygen. In this case, the probability that contaminated oxygen will be used for breathing purposes is much greater than that indicated for aviation service, since recharging activities are not required to inspect technical-type cylinders with the same thoroughness called for in the case of aviators' breathing-type cylinders.

(c) The oxygen-acetylene mixtures may explode spontaneously during cylinder recharging operations, or the gas mixture may be vented accidently into confined spaces in sufficient quantities to support combustion or to detonate if ignited.

4. It is the opinion of the Bureau, after a thorough study of the probable cause of the contamination reported, that oxygen-acetylene mixtures in oxygen cylinders could occur accidentally only as a result of their use in oxyacetylene welding, brazing, or cutting operations; and then only under certain conditions, as follows:

(a) The pressure of the oxygen in the oxygen cylinder is reduced during such operations to atmospheric pressure ("O" gage), or nearly so, and:

(1) Provided the pressure of the acetylene in the equipment remains at operating levels (4 to 15 PSI usually), and torch valves are not closed, a definite portion of the acetylene would be diverted in the torch mixing chamber and enter the oxygen cylinder through the oxygen hose.

(2) The operating conditions are as described in the foregoing paragraph, and the torch tip is plugged with slag, scale, mud, etc., in which case a larger quantity of acetylene would be injected into the oxygen cylinder.

(b) The torch tip is plugged as above, and the operating pressure of the acetylene is greater than the residual pressure in the oxygen cylinder. In which case, oxygen cylinders under pressures above atmospheric could be contaminated with acetylene.

5. In view of the foregoing, it is advised that every effort should be made to safeguard oxygen cylinders during welding and cutting operations, as follows:

(a) Do not withdraw oxygen from oxygen cylinders, either technical or aviators' breathing type, after their internal pressures have been reduced to 25 PSI gage and below. Inasmuch as 15 PSI gage is the maximum pressure of acetylene permitted in oxyacetylene welding and cutting equipment (refer to reference (a)), the enforcement of this provision should safeguard the hazard that acetylene may be transferred to oxygen cylinders with low residual pressures, as indicated in paragraph 4(a) above.

(b) Overhaul acetylene and oxygen regulators periodically, to ensure that they are calibrated and functioning correctly. With these devices in working order, the hazard indicated in paragraph 4(b) is safeguarded, since to inject acetylene into an oxygen cylinder having a residual pressure of 25 PSI gage, under the conditions indicated, would require a pressure of acetylene exceeding the pressure in the oxygen cylinders, and considerably above the maximum acetylene pressure permitted by reference (a).

6. For ready reference the following vital provisions of specification reference (b), regarding aviators' breathing-type oxygen and oxygen cylinders are set forth below and italicized.

(a) Paragraph E-5 of reference (b). "The manufacturer shall insure that cylinders are dry, clean, free from scale, and any other foreign matter, except that dry cylinders marked in accordance with paragraph E-4b and returned with a pressure of not less than 25 PSI shall be considered dry and the valve shall not be removed from the cylinder or opened except during charging unless otherwise specified by the Bureau concerned. <u>However the residual gas in all such cylinders shall be tested as specified in paragraph F-5C to determine that it is oxygen and is free from carbon dioxide and other gases.</u>

(b) Paragraph F-5C of reference (b). "Identification of residual gas in 'Dry' partially charged cylinders returned for refilling."

F-5C(1) Odor. <u>The presence or absence of acetylene or other odoriferous gases shall be determined by cracking the cylinder valve and smelling the escaping gas.</u> (Commercial acetylene has a characteristic garliclike odor. Pure oxygen is odorless and tasteless.)

7. Specifically the above instructions are applicable to the charging of aviators' breathing-type cylinders. In view of the potential hazard to personnel that contaminated oxygen cylinders represent, it is considered desirable to require a similar form of inspection for technical oxygen cylinders also. However, the Bureau does not consider it necessary at this time to specify an inspection procedure whereby all technical-type cylinders would be subject to test for possible contamination. It is believed that the severity of inspection should depend on the incidence of contamination with respect to the number of cylinders examined.

8. It is requested therefore that all activities inspect and test a reasonable percentage of all technical oxygen cylinders that are either to be turned in for refilling or have been received for that purpose. In cases where the cylinders are to be forwarded to a refilling activity, cylinders which are contaminated or under low residual pressures (under 25 PSI) should be fitted with explanatory tags regarding their condition.

9. It is also requested that this Bureau be advised in all cases where oxygen cylinders are found to contain acetylene. If practicable, the following information should be included in each report:

(a) Number of contaminated cylinders.
(b) Activity from which cylinders were received.
(c) Percentage of acetylene and oxygen in cylinders.
(d) Residual pressure in cylinders as received.
(e) Whether there is evidence of acetone in cylinders.
(f) Condition of valves.

--BuShips. R. L. Swart

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Circular Letter 48-32 - This number has been canceled, and no letter will be issued under it.

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