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MEDICAL NEWS LETTER

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TABLE OF CONTENTS

United States Navy

MEDICAL NEWS LETTER

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Policy

The U. S. Navy Medical News Letter is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be, nor are they, susceptible to use by any officer as a substitute for any item or article in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

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Protection of the Heart Through Exercise

One of the psychologic paradoxes of our time is that modern American cardiology, with its stupendous progressiveness in other respects, has until recently imperturbably avoided consideration of neurogenic biochemical pathogenic mechanisms in the origin of functional and degenerative diseases of the heart. With advent of improved and simplified methods of catecholamine assay in blood and tissues, however, this traditional aloofness has suddenly given way to a widespread and intensive preoccupation with the biochemical and cardiotoxic effects of the sympathetic system and of its neurohormones, norepinephrine and epinephrine.

Pathogenic and Protective Neurovegetative Influences on the Heart

Under normal circumstances, sympathetic and vagal neurosecretory activities are purposefully integrated in cardiovascular homeostatic functional patterns under the equilibrating guidance of the central nervous system. However, a variety of extraordinary conditions in the central nervous system as well as in the periphery are capable of aggravating the potentially oxygen-wasting, efficiency-impairing, hypoxiating, and necrotizing properties of the adrenosympathogenic catecholamines to acutely or insidiously harmful and even fatal degrees.

It is known that the vagus preserves cardiac oxygen and increases myocardial efficiency by slowing the heart rate and possibly also by, as yet poorly understood, favorable cholinergic influences on ventricular inotropic behaviour and oxygen economy. However, no vagal fibers reach the ventricles, and the existence of a genuine negative inotropic action of the vagus and of acetylcholine on ventricular dynamics is still controversial, even though the ventricular tissue contains relatively large quantities of acetylcholine. Some negative inotropic effects, observed in intact animals and human beings, may be attributable to reflectory stimulation of recently discovered cardiac sympatho-inhibitory centers in the hypothalamus.

Exercise Habits and Neurovegetative Status of the Heart

One of the most impressive examples of powerful cholinergic and/or sympatho-inhibitory regulatory effectiveness is the so-called "athlete's heart." It was formerly dreaded, but is now recognized as highly efficient and resistant to stress. Recognizing this effect, it has been suggested that the opposite—a deficiency of these mechanisms—might be involved in the origin of various functional and degenerative cardiac anomalies. This applies in particular to pathologic conditions with a more or less conspicuous sympathogenic adrenergic

background, such as angina pectoris. These are characterized by typically catecholamine-induced manifestations—hypoxic cardiac pain, arrhythmias, subendocardial necrotic and fibrotic foci, and metabolic abnormalities which are likewise analogous to the cardiac metabolic effects of experimental catecholamine intoxication.

Significantly, all of these signs and symptoms can be mitigated or abolished by specific antiadrenergic procedures. The action of digitalis, although not strictly cholinergic, resembles that of vagal stimulation in that it diminishes the heart rate and improves myocardial oxygen economy and efficiency. Finally, there is mounting evidence that the increasingly advocated therapeutic utilization of various types of physical exercise in overtly cardiac patients may also be based, in part, on the restoration of an adequate vagal cholinergic and/or sympatho-inhibitory tone.

Cardiac Pathogenic Implications of Sympathetic Overactivity Due to Lack of Exercise

The pathogenic implications of an exaggerated cardiac sympathetic tone, resulting from lack of physical exercise, seem to be consistent with the results of extensive statistical studies. These reports show that the morbidity and mortality from degenerative heart disease, especially myocardial infarction, are significantly lower and occur later among physically active than among sedentary individuals.

In evaluating the presumable heart-protecting role of habitual exercise, one must distinguish between neurovegetative influences on the heart muscle itself and those on the coronary arteries. It appears significant that one investigator found the catecholamine-induced myocardial metabolic changes after acute exercising less pronounced in trained than in untrained animals.

From daily experience, it is well known that a healthy myocardium in a generally normal internal environment is vigorously stimulated, but only very rarely injured by the acute temporary influx of neurogenic and adrenal medullary catecholamines during the process of exercising as such. On the other hand, maintenance of a more or less permanently elevated sympathetic tone, as caused by lack of exercise and/or by prolonged emotional tensions, seems to create in the heart muscle an unfavorable, metabolically hazardous situation, especially when it coincides with vulnerability-increasing hypoxiating coronary atherosclerosis, arterial hypertension, and ventricular hypertrophy.

From one extensive statistical study, no relationship could be established between degrees of occupational physical activity and incidence of coronary atherosclerosis, whereas a definite relation existed between the incidence of "ischemic myocardial fibrosis" and lack of exercise. Thus it appears that a protective neurovegetative influence of habitual vigorous exercise is more clearly established regarding the myocardium than regarding the coronary arteries. Over-all cardiac morbidity from coronary disease should be substantially reduced by a lessened vulnerability of the myocardium, as provided

by exercise-induced cholinergic and/or sympatho-inhibitory mechanisms. One group interprets their findings as a "further suggestion that ischemic heart disease is not a simple function of coronary artery disease." This coincides with the author's opinion that ischemia can be caused by specific metabolic oxygen-wasting catecholamine action alone as well as by a narrowing of the coronary bed and, of course, to a maximal degree, by a combination of both factors.

Cardiac Reconditioning and Rehabilitation Through Physical Exercise

From the preceding discussion, it may be assumed that vigorous physical exercise habits (together with dietary precautions and, if possible, avoidance of excessive emotional stresses) contribute to maintenance of myocardial health by preventing an undue sympatho-adrenergic over-activity of the heart muscle, the crucial feature of "loafer's heart."

No definite explanation is yet available of the mechanism by which exercise habits modify the neurovegetative resting tonus of the heart. Changes in cerebral cortical and hypothalamic stimulus formation and an involvement of conditioned reflex processes appear to be the most likely possibilities in view of the dominating role played by the central nervous system in cardiac functional regulation.

In view of the now widely appreciated fact that reasonably intensive occupational and sportive physical activities do not constitute a significant danger for the primarily normal heart muscle, the cultivation of endurance sports and strenuous games among unquestionably healthy young individuals is to be encouraged for somatic as well as psychologic reasons. However, "over-training" in the very young should be avoided because their cardiac sympathetic tone is high from the beginning and, therefore, subject to potentially harmful exaggerations.

Endurance sports are more likely to develop a high cardiac cholinergic and/or sympatho-inhibitory tone than are mere strength and skill sports. It is also important to remember that the neurovegetative gains made during a prolonged training period are apt to be largely lost within months or even weeks after discontinuance of physical activity.

With advancing years and with gradual development of catecholamine-"toxifying" factors, the impact of acutely exercise-induced influxes of catecholamines into the heart muscle—particularly in the "loafer's heart"—becomes more and more detrimental, causing anginal pain, arrhythmias, necrotic and fibrotic lesions, "pseudo infarctions" and, ultimately, congestive heart failure and death. The further advanced the complicating factors become, such as coronary atherosclerosis, hypertension, and hormonal or nutritional abnormalities, the more necessary will it be to exert the utmost caution in attempts to recondition the heart through graded exercise practices.

Despite existing uncertainties and limitations, the outdated policy of immobilizing each recognized or suspected cardiac patient has been replaced in recent years by a much more rational and courageous attitude on the part of the medical profession and the lay public alike. Even more important than the rehabilitation of already manifestly diseased hearts is the timely reconditioning of those which, having not yet displayed any distinct signs of deterioration, are nevertheless headed for serious trouble. Successful attempts in this respect have been undertaken in many areas—particularly West Germany, Switzerland, Austria, and Soviet Union—but organized reconditioning programs for larger groups of sedentary individuals have not yet been developed in the United States. Health consciousness here is still largely overshadowed by "disease consciousness" as the prevalent attitude. (W. Raab, Metabolic Protection and Reconditioning of the Heart Muscle Through Habitual Physical Exercise: Ann Intern Med, 53: 87-105, July 1960)

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Oral Treatment of Pernicious Anemia

Parenteral injection of cyanocobalamin (Vitamin B_{12}) is well established as an effective and reliable treatment for pernicious anemia. In contrast, currently available preparations for oral use have proved to be much less dependable. Since 1950, study has been made by the authors as to the effectiveness of relatively large amounts of pure cyanocobalamin administered orally without intrinsic factor or other adjuvants.

Results of long-term observation indicate that patients with pernicious anemia can be adequately treated with orally administered cyanocobalamin without addition of a source of intrinsic factor. A weekly oral dose of 1000 micrograms satisfactorily maintained clinical and hematologic remission for periods up to 6-1/2 years, but did not maintain normal serum cyanocobalamin levels. Daily oral administration of 150 micrograms of the drug provided apparently adequate therapy for patients with pernicious anemia in relapse, but did not restore the serum cyanocobalamin levels to normal. Daily oral administration of 1000 micrograms not only provided adequate therapy for pernicious anemia, as judged by clinical and hematologic observation, but in every instance studies resulted in the return of serum cyanocobalamin levels to normal.

Recently, it has been demonstrated by studies with radioactive cyanocobalamin that there are two mechanisms by which cyanocobalamin can be absorbed from the gastrointestinal tract. One is dependent on the presence of intrinsic factor in the gastric secretions and makes possible the absorption of the small amounts of cyanocobalamin normally found in food. The other is independent of intrinsic factor activity and apparently functions in both normal persons and patients with pernicious anemia when massive amounts

of cyanocobalamin are ingested. Presumably, the clinical efficacy of massive oral cyanocobalamin therapy is possible because of this second mechanism. Although the oral treatment of pernicious anemia with either 1000 micrograms of cyanocobalamin each week, or 150 micrograms daily, was clinically and hematologically effective, the serum cyanocobalamin level of many of these patients remained in or near the relapse range. Because patients maintained for many years in programs of parenteral therapy which have been well established as clinically and hematologically adequate have similarly low serum cyanocobalamin levels, it is obvious that low serum cyanocobalamin levels do not always correlate with clinical manifestations of the disease.

Daily oral administration of 1000 micrograms of cyanocobalamin is an effective treatment of pernicious anemia; the normal serum cyanocobalamin levels attained indicate that continued therapy would be successful in maintaining remission indefinitely. It seems likely that smaller doses would be adequate. However, the optimal daily dose is more than 150 micrograms per day, as this lower dose did not restore the serum levels to normal. Oral therapy of pernicious anemia with currently available commercial preparations, such as the more than 200 items listed in the current Physicians Desk Reference, cannot be recommended for routine treatment because of the grossly insufficient amount of the vitamin present, despite intrinsic factor contained in some of these preparations. (P.A. McIntyre, et al, Treatment of Pernicious Anemia with Orally Administered Cyanocobalamin (Vitamin B_{12}): Arch Intern Med, 106: 280-292, August 1960)

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Bretylium and Guanethidine in Hypertension

Appearance of a new effective antihypertensive drug no longer surprises physicians because, between 1950 and 1958, four types of antihypertensive drugs became available for clinical use. They now expect to see developed an antihypertensive drug that is effective in most patients, easy to administer, and without important side effects. These expectations will probably be fulfilled, but until then such optimism should not be allowed to dull critical analysis of new drugs as they become available.

Over a year ago, bretylium and guanethidine were released for clinical trial as antihypertensive drugs with novel mechanisms of action. Both interfere with sympathetic nerve function, either by depressing norepinephrine release or by depleting blood vessels and heart of this amine. Their antihypertensive effects are thought to be due to these actions. Their advantage is that they suppress sympathetic function without causing parasympathetic blockade. In the case of ganglion-blocking drugs, sympathetic vasomotor

outflow is blocked at the ganglia; reserpine not only diminishes outflow from the central nervous system, but also depletes heart and blood vessels of norepinephrine; oral diuretics, at least in the early days of treatment, act predominantly through sympathetic pathways. Hydralazine alone does not seem to have a major nervous systemic action. Because the drugs which have an action through nervous mechanisms cause parasympathetic as well as sympathetic blockade, they can interfere seriously with function of the gastrointestinal and genitourinary tracts.

Before any drug can be accepted as effectively antihypertensive, however, it must be shown to cause neither tolerance nor early or late incapacitating side effects. Further, it must be determined whether the level of arterial pressure can be reduced sufficiently in order that the drug be classed as effectively antihypertensive.

Both bretylium and guanethidine have been under clinical study for over a year. Sufficient evidence has accumulated to show that bretylium has serious disadvantages and that guanethidine, although not ideal, is a potent drug of long-term effectiveness. Since both depress sympathetic function, both cause orthostatic hypotension; this can occur without reduction in supine arterial pressure. This propensity indicates that neither drug can be used as casually as are reserpine and oral diuretics; also that there may be some disagreement as to their effectiveness as antihypertensive agents. However, as yet no reports of tolerance to guanethidine have appeared, such as have appeared with use of bretylium.

Bretylium caused parotid pain in 10 of 13 patients treated by the authors. In a few, the pain was so severe that they did not eat enough to maintain body weight. Its cause is obscure; it is not due to obstruction of Stenson's ducts, and salivary production in response to citric acid has been found to be normal.

Guanethidine's most frequent side effect is mild diarrhea. It usually responds to parasympathetic-blocking drugs and often lessens as treatment is continued.

Both bretylium and guanethidine represent a more specific therapeutic attack on that component of hypertension maintained by sympathetic vasomotor tone. In the authors' opinion, guanethidine is a reasonably effective antihypertensive agent with minimal side effects; bretylium has the disadvantage of more readily developing tolerance, and in large doses, eliciting parotid pain. (I. H. Page, H. P. Dustan, Editorial, Current Status of Bretylium and Guanethidine as Antihypertensive Drugs: Circulation, XXII: 181-183, August 1960)

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Each case has its lesson—a lesson that may be, but is not always, learnt, for clinical wisdom is not the equivalent of experience. —Osler

Endocrine Ocular Changes

Division of endocrine exophthalmos into either pituitary or thyroid types has led to considerable controversy and contradiction regarding the role that each gland may have in this disorder. In addition, the term exophthalmos is frequently used in reference not only to protrusion of the eye, but also to the complex of eye signs which may accompany proptosis.

Analysis of a large group of patients with thyroid dysfunction clearly shows that the endocrine eye lesion accompanying Graves' disease consists of much more than simply exophthalmos, and that associated changes do not necessarily coincide in severity with the degree of exophthalmos. These other components of the eye lesion may, in themselves, be of greater clinical concern to both the ophthalmologist and the patient. The gross components of the eye lesion in thyrotoxicosis consist of proptosis, ophthalmoplegia, lid retraction, and periorbital swelling. Any one may dominate the clinical illness and pursue a course which is quite independent of the others. Since thyrotoxicosis itself is probably a result of multiglandular dysfunction, it seems reasonable to consider that the accompanying eye signs may be influenced by multiple endocrine factors. Furthermore, any component of endocrine eye lesions can occur in patients with or without thyrotoxicosis.

The authors described ocular changes in 165 patients with thyrotoxicosis after I^{131} therapy and compared them to ocular changes with characteristics of the endocrine eye lesion in a small group of patients without clinical hypermetabolism.

Of 165 patients with thyrotoxicosis, two-thirds showed one or more of the components of endocrine eye lesion exclusive of increases in proptosis. Signs and symptoms were present in 73%; 15% were severe, 39% were moderately severe, and 44% were considered minor. The incidence was the same for men as women.

Following I^{131} therapy, all patients were euthyroid; eye signs and symptoms disappeared in 48.5% and no improvement was noted in 5.8%. Ten patients had symptoms with no signs.

Proptosis increased 1.5 mm or more in 65% of patients showing signs of the endocrine eye lesion and remained the same in 26.5%. In the group of 45 patients without signs or symptoms, exophthalmometric readings showed an increase of 1.5 mm or more in only 15.6% and remained the same in 80%. In both groups a total of 51.5% of all patients showed an increase in proptosis. Aside from the increase in proptosis, control of thyrotoxicosis with I^{131} resulted in improvement in the eye lesion in 106 of the 120 patients affected. Seven patients in the group became significantly worse.

Alleviation of symptoms, such as pain, tearing, burning, diplopia, and blurred vision coincided with reduction of periorbital edema, muscle paresis, and lid retraction in spite of a measured increase in proptosis. Only 9% of patients retained significant symptoms or signs after their toxicity was controlled, while proptosis either remained the same or increased in 91.5%.

Of the 165 patients, 14% showed gross ophthalmoplegia. Approximately 50% showed complete return of extraocular muscle function when thyrotoxicosis was controlled. The superior rectus and inferior oblique muscles were involved in almost all instances. In addition, other skeletal muscle weakness occurred more frequently in this group.

Associated pretibial myxedema was found in 5 patients; each had not only some component of the eye lesion, but all 5 still had significant eye disability after control of toxicity. The value of pretibial myxedema as a prognostic sign has been emphasized.

From their observations, the authors suggest that too much emphasis has been placed on the proptotic component of the endocrine eye lesion as an index of the severity of the eye disorder. Although corneal ulcerations and isolated instances of optic nerve damage can occur in relation to proptosis, these complications are extremely rare in thyrotoxic patients treated with I^{131}.

Lid retraction was observed to persist in some cases long after control of thyrotoxicosis, suggesting that it is not a direct result of toxicity. Disappearance of ophthalmoplegia in 50%, however, suggests that the hyperfunctioning thyroid gland plays a direct role in this component.

Patients without thyrotoxicosis who present a clinical picture similar to the endocrine eye lesion frequently have predominately unilateral disease and a high incidence of ophthalmoplegia. While this may imply that pituitary dysfunction is playing a dominant role, these patients will frequently show a positive Werner's test (normal suppression of I^{131} uptake after tri-iodothyronine). Even without evidence of thyrotoxicosis, endocrine dysfunction should be suspected in cases of unilateral proptosis with ophthalmoplegia. This consideration may, in some instances, save extensive and unnecessary neurosurgical explorations.

Management of the endocrine eye lesion must be individualized. Complete and careful workup by internist and ophthalmologist is mandatory. If thyrotoxicosis is diagnosed, control with I^{131} is instituted. If laboratory studies do not support thyrotoxicosis, the patient is given tri-iodothyronine for 5 to 10 days and repeat I^{131} uptake studies are obtained. Failure of physiologic suppression of the I^{131} uptake is regarded as evidence of endocrine dysfunction. A course of tri-iodothyronine in these patients may be of some effect.

In acute congestive forms, or in those rare cases where proptosis and chemosis progress to the extent that corneal damage occurs or is impending, the authors have resorted to pituitary radiation. Progression of the disease has been halted in almost all instances, but sudden improvement or return to normal has not been noted. Supportive therapy—diuretics, elevation of head, lid adhesions, and condensation shields over eyes—may be of considerable help. (R. O. Schultz, H. E. Hamilton, A. E. Braley, Ocular Changes Related to Endocrine Dysfunction: Amer J Ophthal, 50: 26-33, July 1960)

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Gross Hematuria Due to Microlithiasis

For some time, the author has been interested in the problem of so-called essential hematuria which has been defined as hematuria in which no etiologic factor has been found. It is obvious, however, that in gross hematuria a lesion is present for there must be a communication between the blood vessel and the lower urinary tract. In 1944, the author submitted observations on gross hematuria due to minute vascular changes—varicosities in the renal papillae. He now proposes microliths as another minute causative pathologic process in gross hematuria.

Microliths are minute calcified concretions in the glomeruli or tubules. They may cause slight pain and microscopic hematuria, and must be differentiated from interstitial calcification of the kidney.

Various observers have reported seeing microscopic deposits of calcium in from 12 to 100% of kidneys studied. It must be assumed that these workers described both microliths and the commonly found interstitial calcification which is associated with chronic pyelonephritis, tuberculosis, hyperthyroidism, tumors, metallic poisoning, nephrocalcinosis, and many other conditions. While interstitial calcification is common and may be produced by a variety of causes, microliths which are strictly intratubular or intraglomerular are far less frequently found.

It is postulated that these microliths are formed from protein casts probably resulting from previous kidney damage. These casts become calcified and enlarged by apposition. They may form in any part of the tubule or glomerulus. The renal tubule is not elastic so it cannot give way to the enlarging calculus. Adjacent to the tubules are blood vessels and if the tubule is ruptured or perforated, a communication between the blood vessel and tubule results with subsequent hemorrhage. It is true that hematuria may be a rare complication.

Persistent unilateral gross hematuria, without supportive radiographic or clinical findings, is one of the most difficult urological problems. Surgery should only be considered after exhaustive studies of these cases in which gross hematuria of renal origin does not subside under more conservative treatment.

The author presents cases of persistent gross hematuria in which the pathologist found microliths rupturing into blood vessels from renal tubules or glomeruli. Although careful sections of the pathologic specimens did not reveal any other source of the bleeding, it is difficult to prove that the microliths were the sole cause of the hematuria. Without other findings, it must be assumed that the microliths were the etiologic factor. At one time, there was a question as to whether some of the tissue destruction seen in the slides was an artifact due to the crushing of the microtome knife on the microliths and surrounding tissue. However, several pathologists have expressed the opinion that the ruptured blood vessels are not artifacts.

One might theorize that renal damage due to sulfonamide therapy might be an important factor in formation of microliths. Keyser, in 1945, expressed the opinion that sulfonamide lithiasis forms by the deposition of spiculated crystals of acetylated sulfonamide into hemorrhagic areas of tubular degeneration produced by the irritant effect of the crystals clogging the urinary tubules. These crystals may become the precursor of stones which can become detached and grow in stasis near the calyces or persist as small calculi in the tubule. This appears to be a likely factor in the formation of microliths described by the author. (C. A. Hoffman, Gross Hematuria Due to Microlithiasis: J Urol, 84: 201-205, August 1960)

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Tumors of the Neck

It is probable that a greater variety of diseases is found in the neck than in any other area of similar size in the body. They range from the common pathologic changes in the thyroid gland to hemangioendothelioma of the submaxillary gland, of which only one case has been reported. Because of the architecture of the neck, packed with structures passing from head to thorax, a great number of these diseases become manifest as palpable masses or visible swellings. Neoplasms, inflammations, cysts, functional hypertension, and congenital anomalies stimulate the interest of the internist, surgeon, radiologist, and pathologist, as well as the anatomist and embryologist.

Of nearly 250,000 admissions to three hospitals studied by the authors, 1.22% were patients presenting swelling in the neck. Of the 3027 patients with neck masses, 1411 had masses of primary thyroid origin, leaving 1616 or 53.4% with diseases of other origin, including metastases from the thyroid gland.

Choosing a simple classification of (1) neoplastic, (2) inflammatory, and (3) congenital, fewest of the authors' cases were in the second category. Increasing use of antibiotics has played an important part in reducing the number of these lesions requiring operation.

Of 1370 neoplastic masses, 77.5% were malignant, of which 84.8% were metastatic from other regions of the body. Metastasis requires search for a primary lesion which may frequently be small, obscure, and asymptomatic. In the authors' series, 85.4% had primary sites above the clavicle.

In the inflammatory group, constituting 6.2% of cervical swelling, all but 2 were acute.

There were 194 congenital and other masses—58.3% due to congenital defects resulting from failure of the embryonic pharynx to achieve entirely its mature development. Most frequent among these defects were cysts of the thyroglossal duct. Various branchiogenic anomalies account for another 23%. These tumors tend to become manifest early in life.

Salivary gland swellings due to blockage of the duct were responsible for 27.8% of the third group of swellings. Ductal calculus was the chief cause. Other causes in this class were due to such diverse conditions as esophageal diverticula, myocele, hematoma, congenital hypertrophy of neck muscles, and others.

Certain diagnostic aids are available to the clinician as he observes masses in the neck. The signs are not definitive, but they are indicative. Of the neoplastic diseases, 75% will occur in males. The other lesions will be equally distributed between the sexes.

A careful study of the patient's history will, in many instances, aid in diagnosis. The age of the patient and time of onset are important. The statement by Hendrick is applicable: "Tumors and cysts which have been present for years are usually congenital in origin in contrast to those present for a period of months which are more probably neoplastic, and those present for a period of days, inflammatory. Pain early signifies, in most instances, an inflammation; when developing late, it represents neoplasm." It will be convenient to remember these time intervals as a "rule of seven"—inflammatory tumors have usually existed for 7 days, neoplasms for 7 months, and tumors of embryonic origin have been present for 7 years before causing trouble.

Specific diagnosis of neck tumors requires microscopic confirmation, preferably prior to definitive therapy. Material for diagnosis may be obtained by a variety of methods, such as incisional, excisional, or aspiration biopsy. The last, because of ease and simplicity, is recommended as the initial step. Where diagnosis can be made from aspirated material, the distortion from incisional or excisional biopsy is avoided.

So far as is known, aspiration offers no greater hazard to the patient than do other methods of biopsy, and appears to offer less because fewer vessels are usually disturbed. In the event of malignancy, the needle track can, and should, be excised if subsequent surgical procedures are employed.

Certain characteristics of lesions of specific types may be examined in detail:

Congenital Lesions

Thyroglossal Duct. Cysts and fistulas are midline lesions of congenital origin arising from epithelial remnants along the path of the embryonic thyroglossal duct. Such embryonic rests may lie anywhere between the foramen cecum at the base of the tongue and the suprasternal notch. The consistency of the tumor is soft and cystic. Although they are most common in children, these tumors may be found in patients of any age. Sebaceous cysts, dermoid cysts, and the pyramidal lobe of the thyroid should be kept in mind as possible diagnoses.

Branchiogenic Anomalies. These lesions differ from the preceding in their lateral position. They are most commonly found at the mandibular

angle, but may be found from the supra-auricular region down to the level of the clavicle. They may become manifest at any age and there is some evidence that their occurrence is familial. There is a question as to their potential malignancy.

Cystic Hygroma. This is a multilocular cystic lesion of embryonic lymph vessel origin. It may occupy the entire neck and, although benign, it may be locally invasive.

Benign Neoplastic Lesions

Lipomas, sebaceous cysts, fibromas, neurofibromas, and other benign lesions do not present many real diagnostic problems. Sometimes, the sebaceous cyst is found to be dermoid and the lipoma to be a fibroma. Because accurate diagnosis is not always possible, total surgical removal is always advisable.

Malignant Neoplastic Lesions

Primary Lymphoma. This lesion is extremely difficult to diagnose clinically and requires microscopic confirmation. From a surgical standpoint, one or more unilateral or bilateral lymph nodes with enlargement, ovoid or not, with smooth or lobulated "nodular" surface, in upper or lower cervical region—usually the posterior triangle—are the characteristics of a malignant tumor. These tumors are generally radiosensitive but not radiocurable. Surgery plays only a diagnostic role in their management, although en bloc dissections are performed under suitable clinical conditions.

Metastatic Lesions. A nontender, discrete, hard, enlarged, movable or fixed lymph node in a patient over 50 years of age most probably represents a metastatic tumor. Head and neck examination should be especially thorough. Upon failure to identify a primary tumor, thoracic and abdominal examination should be made. Left supra-clavicular masses should suggest an intra-abdominal primary site.

Primary Salivary Gland Tumors

Benign tumors present as slow growing, painless swellings, freely movable, with a firm cystic or nodular appearance. Malignant tumors have a rapid rate of growth and are usually fixed to skin, deep structures, or bone. They are hard; in one-third of the cases, facial nerve paralysis is present, often as an initial symptom. Metastases to lymph nodes, lungs, and bone are frequent.

The potential malignancy of some salivary gland tumors is still controversial. Both recurrence after incomplete ablation and aging of the tumor have been held responsible for malignant transformation of these tumors.

Among the salivary glands, the parotid is the most frequent site of neoplasms. Because tumors of the parotid gland recur if excision is incomplete, it is of prime importance to understand the anatomy (and its possible variations) of the parotid gland and facial nerve. (J. E. Skandalakis, et al, Tumors of the Neck: Surgery, 48: 375-384, August 1960)

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Surface Cooling and Heparinization in Therapy of Burns

Factors responsible for thermal injury produce different degrees of damage to the affected areas. Tissue damage is related to the physical properties, duration of application, and thermal gradient of the burning agent.

Tissue damage is primary in some areas and secondary in others, i. e., some cells are totally destroyed initially because of the intensity of the heat generated at the site of burn; other cells are damaged later as a result of secondary vascular thrombosis in and about the burn area.

Little can be done to save the initially destroyed cells, but protective measures can be taken for cells in danger of secondary damage. In analyzing the elements of cellular damage in thermal injury in a secondary pattern, certain situations exist:

1. Tissue edema in and about the burn area impairs to a certain extent the vascular function of the area.
2. Hemoconcentration increases tendency to vascular thrombosis.
3. With impaired vascular channels in and about the burn area, cells with reversible damage are apt to suffer from anoxia unless the metabolic pattern is lowered temporarily.
4. Damaged cells have a tendency to liberate their fatty contents. Fat globules are found in the systemic circulation in severe burns and are probably responsible for some of the local and systemic manifestations.

Unless action is taken to avoid or minimize secondary tissue damage, the burn area is apt to appear worse in the days following initial injury.

Forty patients were treated by the author, employing regional surface cooling and long-term heparinization. The patients presented burns of 5 to 20% of the body surface, mostly of second, deep second, and third degree. Ice-cold towels were immediately placed on the burned areas, replaced as frequently as necessary during a 5-hour period, and then continued only if the patient complained of pain. Once the patient felt comfortable, cold towels were discontinued and all burn areas were exposed to the open air. No cleansing or debridement of burn tissues was attempted unless definitely indicated. In a later phase, limited debridement was carried out to check infection and assist drainage. Prophylactic antibiotics were employed in burns of over 15% of body surface, and in uncooperative children. Intramuscular heparin was employed in all patients. Intensive active mobilization and constant elevation

of burn areas were carried out from the time of admission. Significant results of this regimen were:

1. The majority of patients—36 out of 40—did not require any narcotic, barbiturate, or analgesic at any time.
2. Weeping of burn areas was minimal at all times.
3. The degree of edema in and about the burn area was minimal.
4. No hemorrhages appeared in and about the burn areas.
5. Deep second and third degree burns revealed a minimal tendency to contracture; scars were observed to be soft and glistening.
6. Gross infection of burns was occasional; it was the impression of the observer that there was no need for prophylactic antibiotics.

Prolonged intensive cooling can be destructive to tissue. By using cold towels and replacing them when they no longer feel cool, the destructive property of prolonged and excessive cold is avoided. Local cooling may be helpful in several ways: (1) The metabolic rate of the burn area is reduced and anoxia is less likely to occur. (2) Because tissue healing is slowed by cooling, cooling is discontinued as soon as the patient is comfortable. Therefore, the treatment is self-limited. (3) By reducing edema, cooling will improve venous and lymphatic drainage. Investigation has shown the phenomenon of platelet escape from the peripheral circulation during generalized surface cooling. A low platelet concentration in the burn area treated by cold might lessen the occurrence of thrombosis. (4) All inflammatory phenomena are less likely to occur under local cooling.

Heparinization is considered to be effective by reducing the tendency to sludging of red cells and thrombosis, by its anti-inflammatory action and effect on phlebitis, by improvement of oxygen consumption by tissues, and by its clearing function on fat globules liberated from the burn areas.

Active mobilization and elevation, particularly during early stages of therapy, assure adequate circulation to affected areas. During the cooling period, mobilization counteracts the possible dangers of extreme cooling.

The author concludes that heparinization and cooling will assure a better chance for survival of cells which are not destroyed by the thermal episode in the initial stage. (G. M. Berberian, Temporary Regional Surface Cooling and Long-Term Heparinization in the Therapy of Burns: Surgery, 48: 391-393, August 1960)

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Clinical Clerkships Established at Guam Hospital

RADM B. W. Hogan, Surgeon General of the Navy, has announced that a postgraduate training program for Micronesian medical personnel has been established at the U. S. Naval Hospital, Guam, M. I. In announcing the program, ADM Hogan said that it would be called the "Clinical Clerkship Program"

and that trainees taking part would be designated "Clinical Clerks." The program will be limited to a maximum of four trainees at any one time; training will last for a period of one year.

Four clerks from the Agana, Guam area began their training under the new program on 1 July 1960. Their instruction will include training in Surgery, Urology, Ophthalmology, Otolaryngology, Dermatology, Anesthesiology, Orthopedics, Clinical and Microscopic Pathology, Roentgenology, Neuropsychiatry, Internal Medicine, and Pediatrics. No training will be given in Obstetrics, Gynecology, or Tuberculosis. The comprehensive indoctrination will also include patient nursing care and routine administrative matters.

ADM Hogan said that the program was established following an agreement that had been reached between the High Commissioner, Agana, and the Commander, Naval Forces, Marianas. High Commissioner D. H. Nucker said he felt that as a result of the postgraduate training, Micronesian medical personnel would be able to handle more effectively the medical and public health problems in their districts. (TIO, BuMed)

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Navy Mutual Aid Terminal Dividend Increased to $2500

The Board of Directors of the Navy Mutual Aid Association, on 12 August 1960, voted to pay a $2500 terminal dividend to the designated beneficiary of any member whose death shall occur after 1200 EST on 12 August 1960. This dividend is provided at no extra cost and is payable in addition to the regular benefit of $7500. The total death benefit is now $10,000.

Paid-up memberships of less than $7500, terminated by death, will be increased by 33-1/3%. The dividend does not increase the loan or surrender values of memberships. This action by the Board of Directors is the fifth increase in the terminal dividend since 1954. It was made with the approval of competent actuarial authorities after a review of the Association's reserves and general financial condition.

All regular commissioned and warrant officers on active duty, including reserve officers on extended active duty, of the Navy, Marine Corps, and Coast Guard are eligible for membership. Membership is permanent and change in status, such as resignation, retirement, or release to inactive duty, will not in any manner affect the membership.

Officers wishing additional information should contact a Nonresident Director or write directly to the Navy Mutual Aid Association, Navy Department, Washington 25, D. C.

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Navy Medical Officer Reunion

RADM T. G. Hays, District Medical Officer, 12th Naval District, announces that plans have been made to hold a reunion of Navy Medical Officers—active duty, Reserve, retired, and former officers—who are now residing in the San Francisco area, or are attending the 46th Annual Clinical Congress of the American College of Surgeons, 10 - 14 October 1960. The reunion, to consist of a reception and buffet, will be held from 1830 to 2030, 11 October 1960, at the Marines' Memorial Club, Sutter and Mason Streets. Reservations are required; ladies and guests are particularly invited. To secure further information or make reservations, write to CDR J. P. Duane MSC USN, District Medical Office, 12th Naval District, 50 Fell Street, San Francisco 2, Calif.

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BUMED INSTRUCTION 1500.7 26 August 1960

Subj: Part-time Outservice Training, administration of

The Bureau of Medicine and Surgery encourages Medical Department personnel to take advantage of part-time outservice training in accredited civilian institutions and will authorize tuition aid, provided funds are available, for courses directly related to areas of Medical Department responsibility. Such areas are considered to be the physical, chemical, clinical, biologic, and socio-psychology sciences and the fields of Medical Department Administration. Consideration will also be given to requests for courses outside those areas if they can be shown to be a necessary part of a fully planned program leading to a degree or certificate which will enable the applicant to assume increased responsibility or to function more effectively toward accomplishing the mission of the Medical Department. This instruction provides information concerning the scope, requirements, and administrative procedures for the Bureau's part-time outservice training program.

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Board Certifications

American Board of Ophthalmology
CDR Charles M. Callis MC USN

American Board of Surgery
LCDR Scott G. Kramer MC USN

Board of Thoracic Surgery
CAPT Robert J. Fleischaker MC USN

Recent Research Reports

U.S. Naval Medical Research Institute, NNMC, Bethesda, Md.

1. Effects of Shock and Vibration on Man. Lecture and Review Series No. 60-3, 8 January 1960.
2. Endocrine Adaptive Mechanisms and the Physiologic Regulation of Population Growth. Lecture and Review Series No. 60-2, 18 February 1960.
3. Principle and Method of Heatburst Microcalorimetry and the Determination of Free Energy, Enthalpy, and Entropy Changes. Lecture and Review Series No. 60-4, 1 March 1960.
4. Blockade of the Action Current in Single Nodes of Ranvier from Frog Nerve by Physostigmine and Certain Aminoalcohol Derivatives. MR 005.06-0010.01, Report No. 17, 18 March 1960.
5. The Structure of Water and Electrolyte Solutions. Lecture And Review Series No. 60-5, 21 March 1960.
6. Constant Potential (Low Voltage) X-Ray Generators for Use in Contact Microradiography. Memorandum Report 60-1. MR 005.02-0001.06, 5 May 1960.
7. Electrical Characteristics of Insect Mechanoreceptors. Report No. 1, MR 005.09-1401.04, 10 May 1960.
8. Centrifugation of Rickettsiae and Viruses onto Cells and Its Effect on Infection. MR 005.09-1200.02, Report No. 5, 8 June 1960.
9. The Cultivation of Dengue-1 (Hawaiian) Virus in Tissue Culture. I. Carrier Culture of Human Skin Cells Infected with Dengue-1 Virus. MR 005.09-1200.01, Report No. 2, 8 June 1960.

U.S. Naval School of Aviation Medicine, Naval Air Station, Pensacola, Fla.

1. Ballistocardiographic Study of Left Bundle Branch Block. MR 005.13-7004, Subtask No. 6, Report No. 8, 1 March 1960.
2. A Device for Humidification of Inspired Dry Oxygen and Prevention of Hyperventilation. MR 005.13-3100, Subtask No. 6, Report No. 1, 1 March 1960.
3. Restraint Adaptation and Altitude Tolerance in the Rat. MR 005.15-2001, Subtask No. 3, Report No. 2, 8 March 1960.
4. Whispered Monosyllabic Speech, Initial and Final Consonant Confusions. MR 005.13-7003, Subtask No. 1, Report No. 86, 25 March 1960.
5. Catalog of Translated Material in Space Perception (Revised) MR 005.13-6001, Subtask No. 1, Report No. 51, 21 April 1960.
6. Gross Effects of Liquid O_2 Contaminants, Additional Studies. MR 005.13-3100, Subtask No. 7, Report No. 2, 27 April 1960.

(To be continued at an early date)

From the Note Book

CDR Siegel Cited. CDR Jacob Siegel MSC USN, Officer in Charge, Navy Toxicology Unit, National Naval Medical Center, Bethesda, Md., recently was commended by RADM B. W. Hogan, Surgeon General of the Navy, for his outstanding performance of duty. With development of new weapon systems, rapid progress, and advanced instrumentation within the Navy, there has emerged a wide field of potential and immediate medical problems. One of the most important areas has been toxicology and its many implications. Under outstanding direction by CDR Siegel, the Navy Toxicology Unit has made many important contributions to the success of the Navy's Polaris Program, has participated in establishment of biologic parameters in closed environmental systems, and has rendered support to other Navy Bureaus and Offices. (PIO, NNMC)

Massive Doses of Prednisone. Occasional clinical use of excessively high doses of corticoids in treatment of patients with certain diseases prompted a comparison of the metabolic effects of high and massive doses of prednisone. Studies of metabolic balance were made with doses of 100 mg and 1000 mg of prednisone daily. The authors' data suggest that the lower dose can produce a nearly maximal catabolic effect. Their finding does not provide any basis for understanding the occasional therapeutic benefits of massive doses of corticoids. (M. Lipsett, et al, J Lab Clin Med, July 1960)

Dexamethasone Therapy. Studying 54 patients with rheumatoid arthritis receiving dexamethasone, the authors demonstrate that the drug does not satisfy the criteria for a potent anti-inflammatory drug with a minimum of undesirable physiologic side effects. Undesirable reactions were observed as frequently as with other steroids—in some instances more prominent. Peptic ulceration developed in 4 patients, but no consistent alteration in gastric juice production was observed. (J. Zuckner, et al, Amer J Med Sci, July 1960)

Cancer Cells in Blood Stream. Studying the appearance of cancer cells in the blood stream in relation to the pathologic condition and diagnostic or operative procedures, the authors concluded that vascular dissemination of cancer cells during curettage is more than a theoretic possibility in patients with malignant diseases involving the endometrium. (S. Roberts, et al, Surg Gynec Obstet, July 1960)

Intrathecal Amethopterin. Amethopterin was given intrathecally to 2 patients with spinal cord involvement, due in one to metastatic nasopharyngeal carcinoma, and in the other to Hodgkin's disease. Improvement was noted in the neurologic manifestations in both cases. (U. El-Ghaffar, Cancer, July - August 1960)

Chemotherapy Against Embolic Tumor Cells. Observations of the authors tend to demonstrate that while certain chemotherapeutic agents may have considerable destructive effect upon neoplastic cells circulating within the vascular network of the body, there is an inadequate concentration of the agent reaching the cancer cells to destroy them totally once established metastatic foci are present. (D. Kinsey, et al, Cancer, July-August 1960)

Renal Revascularization for Hypertension. Renal revascularization procedures were performed on 32 hypertensive patients. Of these, 81% developed normal blood pressure after operation, 19% were improved but demonstrated some residual hypertension. Renal blood flow studies seemed to corroborate experimental evidence pointing away from renal ischemia as a trigger mechanism in production of renovascular hypertension. In unilateral renal artery stenosis, the kidney distal to the occlusive process became the better kidney following revascularization from both a functional and pathologic standpoint. (G. Morris Jr, et al, Surgery, July 1960)

Blood Groups and Hypertension. The authors present a study disclosing a significant decrease in frequency of group A blood in Negro women with the accelerated form of hypertension when compared to white women and Negro or white men. The difference does not appear to be explainable on the basis of ethnic variations. This adds to the evidence that host factors play at least a part in the susceptibility to this disorder. (G. Perera, Ann Int Med, July 1960)

Glaucoma in Diabetes Mellitus. From observations in a diabetes clinic, the authors concluded that the evidence suggests that the incidence of both primary and secondary glaucoma in diabetes is appreciably increased over that in the general population. This indicates that diabetics with any suspicious visual complaints should be considered for glaucoma testing, and glaucoma patients with symptoms even mildly suggestive of diabetes be given routine sugar metabolism studies. (J. Armstrong, et al, Amer J Ophthal, July 1960)

Catheter Drainage. Management of the catheter is a problem in aseptic technique. Adequate attention to the 3 ports of bacterial entry in the urinary drainage system—urethral meatus, connecting tube, and the end of the drainage tube—permits maintenance of a sterile urine as long as the catheter remains in place. A method for catheterization utilizing rigid surgical technique is described. (R. Desautels, New Engl J Med, July 28, 1960)

Familial Aspects of Prostatic Carcinoma. Results of a study of parents and siblings of 228 patients who died from carcinoma of the prostate are compatible with the hypothesis that prostate cancer has a genetic component that is organ specific. (C. Woolf, Cancer, July-August 1960)

Drug Effect on Cerebral Circulation. Cerebral vascular tone and blood flow are largely governed by the gaseous composition and acid-base equilibrium of arterial blood. The authors demonstrated that in persons with cerebral vascular disease, oral administration of nylidrin hydrochloride (Arlidin) for periods of greater than 2 weeks was associated with a 43% increase in cerebral blood flow. As pH and pCO_2 were not significantly affected by nylidrin administration, a primary cardiovascular effect of the agent is suggested. (S. Eisenberg, et al, Amer J Med Sci, July 1960)

Rapid Screening Test for Serum Amylase. A high value for serum amylase is widely regarded as the single most important laboratory finding to help establish a diagnosis of acute pancreatitis. The usual method of determination is time-consuming and requires highly skilled personnel. The authors describe a method which can be completed within 20 minutes, requires a minimum of equipment, and is easily taught to interns, residents, and night laboratory personnel. (A. Hainline Jr, S. Hoerr, Amer J Surg, July 1960)

Einhorn String Test. Studying 25 patients by means of strings containing radiopaque markers, the authors observed: no positive correlation between the location of the blood stain on the string and the lesion in the gastrointestinal tract, and unreliability of attempting to localize the lesion with reference to the distance of the blood stain from the incisor teeth or to the bile stain. They concluded that the string test was of no practical value in either the diagnosis or localization of peptic ulcer. (J. Ewart, et al, Amer J Dig Dis, July 1960)

Anticholinergics and Pancreatic Secretion. An important facet in medical management of acute pancreatitis is "splinting of the injured pancreas" by suppression of pancreatic secretion. Studying the effects of anticholinergics on pancreatic secretion, the authors report piperidyl drugs (Piptal, Cantil) to be more potent inhibitors of secretion than atropine or the Banthine compounds without undesirable side reactions noted with the latter drugs. (D. Dreiling, H. Janowitz, Amer J Dig Dis, July 1960)

Anemia of Cirrhosis. The anemia of Laennec's cirrhosis was studied with specific evaluation of the roles of hemolysis, hypervolemia, and chronic bleeding. Ten of 24 patients had a red cell mass below the normal range. Plasma volume was increased in 15 of the 24 patients; determination of red blood cell survival indicated that 15 patients had decreased survival times; fecal analysis indicated loss of blood into the gastrointestinal tract in 7 of 10 patients studied. Thrombocytopenia---present in 12 of 24 patients—appeared to be associated with intermittent, unsuspected bleeding from the gastrointestinal tract. (T. Sheehy, A. Berman, J Lab Clin Med, July 1960)

DENTAL SECTION

Effects of Abrasive Agents on Amalgam Surface

Although it is generally agreed that three or four abrasives with different qualities are required to produce a high polish on amalgam, considerable variation of opinion exists as to what are the best agents to use and in what order they should be applied. A standard specimen of amalgam was subjected to a number of abrasive tests under standard conditions. The results made it possible to place abrasives in an order of abrasiveness.

Carborundum stone produces such a rough surface that its use is contraindicated as a prelude to polishing. However, carborundum stone removes amalgam speedily, and sometimes is needed when gross modifications to the contour of an amalgam restoration are required. A new finishing bur also removes amalgam efficiently, but leaves a very rough surface. Pumice makes a rougher surface than does a worn finishing bur and its use would appear unnecessary for normal routine polishing. However, if a carborundum stone or a new finishing bur has been used, pumice may be desirable as an intermediate abrasive before the final polish is attempted. Abrasives should not be applied with too great a difference in abrasive qualities between one abrasive and the next.

Irregular, wave-like mounds produced on amalgam by rubber cups contraindicate their use as a means of applying abrasive pastes. Whitening and alcohol, applied with a bristle brush, result in a standard of polish high enough for clinical purposes. Because whitening by itself does not possess enough abrasive power to take an unpolished amalgam through to the final polished state, some other agent must be used to level the rough amalgam restoration sufficiently to enable the whitening to polish effectively. A worn finishing bur does this satisfactorily.

For speedy and efficient polishing of amalgam restorations, the following steps are recommended:

1. The restoration should be carved carefully at the time of filling to make the later use of carborundum stones and new finishing burs unnecessary.
2. A finishing bur that has been well blunted is used to remove marginal edges, make slight adjustments to contour, and provide smoothing.
3. The restoration should be polished with whitening and alcohol applied with a bristle brush.

(J. R. Grundy, Manchester, England, Dental Practitioner, 9: 262-267, July - August 1960)

Dental Technician Career Planning and Reenlistment

The service man's career has been enhanced in many ways in recent years. Legislative action has brought about increased benefits through pay increases, pro-pay, more adequate housing, and medicare for dependents. Response to these advantages was quickly seen during the last pay-raise talks when reenlistment rates began to climb.

Although reenlistment rates have been steadily climbing since fiscal year 1957, the reenlistment rate is not sufficient to match the expected losses from the hard-core World War II petty officers who will retire in the next few years. This, in itself, should be a big boom for first term reenlistments due to vacancies created in the rate structure. Reenlistments of first term personnel must improve markedly if adequate staffs are to be maintained in dental activities ashore and afloat. When a man realizes that the Navy offers an honorable and rewarding career, and after his first 7 years of service, there is about an 85% chance of his remaining in the service for 20 or more years.

At the end of fiscal year 1960, dental technician strength was approximately 2769, or about 90% of authorized requirements. The Bureau of Naval Personnel is scheduling the maximum possible Class "A" school input as one means of building up the dental technician rating numbers during fiscal year 1961. The total Class "A" input will be about 624 students, which at the end of fiscal year 1961, will leave an estimated shortage of 156 dental technicians after expected losses in relation to the expected requirements of 2973.

What can be done to prevent or correct this serious shortage of dental technicians? The naval leadership, as well as the Dental Technician In-Service and Out-Service Training Programs offers potential solutions. These are well established, solid long-range improvement programs which are now in full swing, and if actively supported by all, can be a major factor in improving reenlistments. These programs are designed to increase the prestige and caliber of petty officers and to prepare all dental technicians for advancement in their chosen technical fields. Advanced training for qualified enlisted personnel may be assured if they reenlist—they may even be given provisional orders to school. This is fully explained in Article 12. 8 of the Enlisted Transfer Manual. This program is important and should be emphasized to all hands. Dental technician personnel must, in addition to indicating preference and election of this type of duty under the SEAVEY/SHORVEY procedure, comply with BuMed Instruction 1510. 2.

Chief, First Class, and Second Class Petty Officers are encouraged to request assignment to a course of instruction in the Class "B" school of their technical specialty. Chief and First Class Petty Officers may request assignment to the Medical Administrative Technician School (MAT). Technicians without high school diplomas are encouraged to enroll in USAFI courses. All hands should be encouraged to participate in part-time Out-Service Training.

In this program, training in civilian colleges is authorized when applied toward degrees or for those courses that will enhance the effectiveness of daily work. This over-all training will better qualify all personnel for advancement in rate, contribute to increased proficiency in a chosen specialty, and provide assistance in assuming added responsibilities.

The normal time for school assignments is during the rotation phase of the SEAVEY (Sea to Shore) and SHORVEY (Shore to Sea). This policy is adhered to as closely as possible to eliminate excessive movement of personnel, dependents, household effects and, in general, to conserve funds and provide personnel stability to dental activities.

Personnel who have previously submitted a request for a course of instruction and have been placed on the waiting list should resubmit their request in accordance with BuMed Instruction 1510.2 if they have been rotated under the SEAVEY/SHORVEY procedures prior to being selected.

There are many ways by which sincere and dedicated Dental officers and career petty officers, in daily contacts and associations with young first cruise men, can contribute to establishment of strong motivation for a service career. Regardless of programs, legislation, benefits, operating schedules, manning levels, or state of national economy, it is the individual officer and technician of the Dental Department who can do the most to improve reenlistment rates. The Navy Dental Corps needs the full support of all personnel in this effort.

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Continuous Training Program 1960 - 1961

Recognizing the need for a continuous training program to keep Dental officers of the Navy abreast of the latest developments in dentistry and keyed to a high professional level, the U.S. Navy Dental Corps is offering a series of short postgraduate courses to be conducted by members of the staff of the U.S. Naval Dental School, National Naval Medical Center, Bethesda, Md. Courses are open to active duty career Dental officers of the Armed Forces. Details regarding quotas and eligibility will be published in the near future.

Oral Surgery..... 19-23 Sep 1960 10-14 Apr 1961	Periodontics... 27 Feb-3 Mar 1961 1-5 May 1961
Endodontics..... 17-21 Oct 1960	High Speed Orientation..... 13-17 Mar 1961 24-28 Apr 1961
Oral Roentgenology 31 Oct-4 Nov 1960	
Oral Pathology..... 5-9 Dec 1960	Casualty Care .... 17-21 Apr 1961
Partial Dentures .... 9-13 Jan 1961	Complete Dentures 15-19 May 1961

Personnel and Professional Notes

CDR Staples Honored. The Rhode Island Dental Society recently presented a scroll embossed with the Seal of the Society to CDR William R. Staples DC USN, in recognition of his industrious and cooperative efforts while supporting programs designed to further improve the dental health of the community. Prior to reporting to his present duty station at the U.S. Naval Hospital, Beaufort, S.C., CDR Staples served as Staff Dental Officer, Commander Destroyer Force, Atlantic Fleet.

Federation Dentaire Internationale on Fluoridation. Federation Dentaire Internationale took note of the fact that the World Health Organization has recommended the adoption of fluoridation measures, and itself resolved that "fluoridation of public water supplies be commended to all public authorities as the most effective public health measure available for reducing safely and economically the incidence of dental caries, particularly in the younger age groups."

CAPT Hansen Goes to AFIP. CAPT Louis S. Hansen DC USN recently relieved MAJ GEN Joseph L. Bernier DC USA as Chief, Dental and Oral Division of the Armed Forces Institute of Pathology, Washington, D. C.

Larger DT School Input. Class 2 61, Dental Technician Basic, Class "A" convened on 1 August 1960 at the Dental Technician School, U.S. Naval Training Center, San Diego, Calif., with 52 students. This class, with an increase of 12 students representing approximately a 25% gain, is the first class reflecting the larger input as authorized by the Chief of Naval Personnel for fiscal year 1961.

Navy Dental Officers to Participate at ADA Session. Several Navy Dental officers will participate in the 101st Annual Session of the American Dental Association, 17 - 20 October 1960, at Los Angeles, Calif. Presentations will be as follows:

Essay Program: CAPT R. B. Wolcott, Naval Administrative Command, U.S. Naval Training Center, Great Lakes, Ill., will be moderator of a panel discussion, Practical Restorative Procedures.

Table Clinic: A table clinic, Partial Dentures Compatible with the Periodontium, will be presented by Dental officers of the U.S. Naval Training Center, San Diego, Calif. —CAPT G. D. Richardson, Clasp Design Compatible with the Periodontium; LCDR E. E. Davies, Periodontal Prognosis for Partial Dentures; LT J. J. Lippert (USNR), Remount Procedures for Partial Dentures; LT L. E. Mark, Periodontal Consideration in Tooth Preparation; LT F. J. Miller (USNR), Periodontal Aspects of the Lingual and Palatal Plate; LT J. R. Ross (USNR), Delivery and Reline of the Partial Denture.

Mass Preventive Dental Program at Naval Academy. With physical fitness being heavily stressed at the U.S. Naval Academy, all midshipmen are required to participate in some form of athletics—the majority of midshipmen choose contact sports. In order to prevent damage or possible loss of teeth while engaged in these sports, individual protective mouthpieces are being fabricated for the entire plebe class estimated at 1250 midshipmen. Tailor-made mouthpieces have been successfully used over the past 10 years at the Academy by a small portion of the athletes. Upon the recommendation of CAPT A. Coward USN, Director of Athletics, and under the direction of CAPT K. L. Longeway DC USN, Senior Dental Officer, the Dental Department has undertaken this program during the plebe summer.

The custom-made mouthpieces, weighing one-quarter of an ounce, are comfortable to wear and allow freedom of speech, such as required by quarterbacks or other key athletes. They are fabricated of latex, containing rayon flock fibers. For identification, the individual's name and initials are embedded in the latex material. The mouthpiece, directions for wearing and cleaning, and a metal canister for storing are given to each midshipman.

National Dental Civil Defense Program. One retirement point may be credited to eligible Reserve Dental officers for attendance at the session of the National Dental Civil Defense Program, to be held at the Statler Hilton Hotel, Los Angeles, Calif., 15 October 1960. Presentations to be included in the program are: CAPT H.J. Towle DC USN, Head, Training Aids, U.S. Naval Dental School, NNMC, Bethesda, Md. —Medical Logistics of Nuclear Warfare, and the Navy's Casualty Training Program; Congressman Chet Holifield—The Congressional Viewpoint of Civil Defense; Dr. Carruth J. Wagner, Director of Division of Health Mobilization, U.S. Public Health Service—Training of Health Personnel for Expended Utilization in an Emergency.

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BUMED INSTRUCTION 1520.2G 4 August 1960

Subject: Graduate and Postgraduate Training for officers of the Dental Corps, USN and USNR, on active duty

This instruction provides information regarding graduate and postgraduate training opportunities. Among the changes, Captains of the Regular Navy are now eligible for the 10 months' General Postgraduate Course at the U.S. Naval Dental School

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If a man does not keep pace with his companions, perhaps it is because he hears a different drummer.

—Thoreau

RESERVE SECTION

Do You Have a Question?
References and Directives Have the Answers

Are you looking for the answer to a question about your Reserve career? Do you want information on correspondence courses, promotion opportunities, reenlistment, retirement, active duty for training? In most instances, you'll find the answers to your queries without going further than your unit CO or your Naval Reserve Training Center. Here are some of the basic references which should answer most of your everyday, routine questions.

Copies of directives and references are not available for distribution to individuals. However, most naval activities maintain complete files of this information.

U.S. Navy Regulations - Sets forth the principles and policies by which the Navy is governed.

Navy Department General Orders (Series of 1948) - Supplements Navy Regulations and includes orders relating to special ceremonies, commendations, organization, budget and appropriations, and similar matters.

BuPers Manual - Contains instructions governing the many phases of Navy personnel administration. Part H deals with the Naval Reserve.

Bureau Manuals - Contain instructions pertaining to the various Bureaus within the Department of the Navy.

Instructions and Notices - Directives issued by the Chiefs of the Navy Department bureaus contain policy and procedure of the Navy. Instructions are defined as directives "which contain information of a continuing nature." Notices are directives of "one-time nature, and contain information or require action which can be completed immediately." The most important to the Medical Department Reservist are those promulgated from time to time by the Chief of Naval Personnel and the Chief, Bureau of Medicine and Surgery.

Copies of directives cannot be provided for individual use.

Joint Travel Regulations, 1951 - Explains laws and regulations concerning travel and station allowances; sets forth the manner in which transportation is furnished, covers reimbursement for travel expenses, et cetera.

U.S. Navy Travel Instructions - Contains instructions relative to the travel of naval personnel in their performance of duty or in connection with changes in duty stations.

U.S. Navy Uniform Regulations - Describes uniforms and contains regulations for the proper wearing of the naval uniform.

Navy and Marine Corps Awards Manual - Provides information pertaining to awards, medals, personal decorations, et cetera. The manual also contains eligibility lists of all ships, units, service groups, divisions, and squadrons for certain awards.

In addition to these more general reference works, there are dozens of directives and publications which deal with specific Reserve matters. Following are some of the most frequently consulted directives:

Subject	Pertinent Reference
Organization of the Naval Reserve under the Armed Forces Reserve Act of 1952, as amended. (Now Title 10, U.S. Code)	BuPers Inst. 1001.5B
Tables of Organization for the Naval Reserve	BuPers Inst. 5400.11
Advancement and Changes in Rates and Ratings of Enlisted Reservists on Inactive Duty	BuPers Inst. 1430.1C
Reserve Integration Program	BuPers Inst. 1120.26B
Medical Service Corps, USNR	BuPers Inst. 1120.23B
Staff Corps Appointments	BuPers Inst. 1120.6A
Billet and Officer Designator Codes	BuPers Inst. 1210.4C
Change of Officer Designator Codes	BuPers Inst. 1210.6A
Promotion of USNR Officers	BuPers Inst. 1412.1D
Professional Fitness for Promotion of USNR Officers (the "promotion plan")	BuPers Inst. 1416.4C
Roundup of Correspondence/NROS Courses Required for Promotion	Naval Reservist, Aug. '60
Nondisability Retirement with Pay	BuPers Inst. 1820.1B
Transfer to Retired Reserve Without Pay	BuPers Inst. 1820.2A
Contingency Option Act of 1953	BuPers Inst. 1750.2
Roundup of Retirement Information; Retirement Pay Chart	Naval Reservist, Nov. '59
Naval Reserve Officers on Active Duty in Connection with the TAR Program	BuPers Inst. 1001.10D
TAR Billet Opportunities for Reserve Officers on Inactive Duty	BuPers Inst. 1331.4B
Active Duty of Enlisted USNR Personnel in Connection with the Naval Air Reserve TAR Program	BuPers Inst. 1001.7B
Information and Policies on Active Duty for Training (ACDUTRA)	BuPers Inst. 1571.1A
Catalog of Available ACDUTRA	BuPers Inst. 1571.4F
Assignment and Termination Policies for the Naval Air Reserve	BuPers Inst. 1301.5D
Information and Policies Regarding Women in the Naval Reserve on Inactive Duty	BuPers Inst. 1001.2A

Subject	Pertinent Reference
List of Training Manuals and Correspondence Courses	NavPers 10061-J
Regular Navy Augmentation Program	BuPers Inst. 1120.12G
Active Duty Agreements for USNR Officers	BuPers Inst. 1120.22B
Voluntary Recall to Active Duty of USNR Officers	BuPers Inst. 1331.4B
Recall Policy	BuPers Inst. 1001.15B
Screening Enlisted Members of the Ready Reserve	BuPers Inst. 1001.6B
Identification Cards	BuPers Inst. 5512.2A
Regulations Governing Furnishing of Clothing in Kind or Cash Allowances to Enlisted Reservists on Inactive Duty	BuPers Inst. 1020.4B

(The Naval Reservist, August 1960)

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PREVENTIVE MEDICINE

Recent Advances in the Chemotherapy of Infection

(Conclusion of abstract appearing in the Medical News Letter, Vol. 36, No. 3, 5 August 1960)

Combinations of Antimicrobial Agents

With the advent of each new antimicrobial agent, development of drug-resistant bacterial strains and reports of enhanced in vitro antibacterial compounds, there has been a remarkable expansion in the number of different antibiotics which are being put together in "fixed dose" form. The rapidity with which they are appearing and being recommended for clinical use is startling. The readiness and enthusiasm with which many physicians have accepted claims made for such combinations and are using them in practice is remarkable because, with few exceptions, there is a striking lack of critically evaluated and controlled data in support of their use in treatment of disease.

The field of combined antibiotic therapy is confused at the moment. Physicians are bombarded on one side by claims of superior effectiveness

of combinations and on the other by an increasing number of comments in the medical literature that they are of little or no value or are even dangerous.

Simultaneous administration of more than one antimicrobial agent has been suggested for (a) treatment of mixed bacterial infections, (b) reduction of "toxic" effects of antibiotics, (c) reduction of required dose of a drug or duration of therapy or both, (d) removal of superficially located bacteria, (e) delay in rate of emergence of bacterial resistance, (f) enhancement of therapeutic activity, and (g) therapy of severe infectious processes in which the specific etiology has not been established.

Treatment of Mixed Bacterial Infections. In some instances, responsible bacteria, although of different species, are sensitive to a single antimicrobial agent, while in others they have distinctly different drug susceptibilities. This emphasizes the need for individual determination of drug-sensitivity of each component of a mixed flora before therapy is initiated. The antibiotics to be given are selected on the basis of these studies and administered in full doses. In some cases, it may be unnecessary and even dangerous to delay initiation of treatment until definitive bacteriologic data is available. Peritonitis is an outstanding example. Because both Gram-positive and Gram-negative organisms may be acting synergistically to produce this disease and delay in therapy may result in a rapidly fatal outcome, treatment should be started immediately with maximal quantities of the antibiotics known to be most effective against these types of bacteria.

Reduction of "Toxic" Effects of Antibiotics. It has been suggested that when certain antibiotics are combined in quantities smaller than those usually employed, the risk of untoward reactions is minimized without reducing the degree of antibacterial activity. This is not necessarily true. Some antibiotics produce adverse metabolic effects. Oral administration of chlortetracycline (Aureomycin) to undernourished adults in a daily dose of 2.5 to 3.0 gm results in loss of body weight, increase in urinary excretion of nitrogen, negative nitrogen balance, and elevation of nonprotein nitrogen in the blood. Similar changes have been produced by oxytetracycline (2.5 to 3.0 gm per day) and chlortetracycline (1 gm per day). Increased urinary excretion of riboflavin, tryptophan, histidine, and threonine may follow the use of chlortetracylcline. These observations raise the question whether other antimicrobial agents may also produce deleterious metabolic effects. Although no data are available, the possibility that interference with normal metabolic processes may be intensified by the administration of two or more antibiotics at one time must be considered.

Delay in Rate of Emergence of Bacterial Resistance. In vitro studies have demonstrated that when an organism is exposed to two antibiotics at the same time, development of resistance to each drug is appreciably delayed, but not completely inhibited; this is true only when sensitivity to both agents is present. The same phenomenon is observed to a limited degree with sulfonamide-antibiotic combinations.

Clinical investigations have indicated that delay of emergence of antibiotic resistance is produced by combinations of antimicrobial drugs in some types of infection, but not in all. Thus, it is now well established that the concomitant administration of two or more drugs suppresses strikingly the development of resistance in the tubercle bacillus. Tuberculosis is best treated, therefore, with at least two and, in some instances (miliary tuberculosis and tuberculous meningitis), with three tuberculostatic agents simultaneously. The same appears to be true in Hemophilus influenzae meningitis in which it has been shown that the injection of streptomycin together with exhibition of sulfonamide eliminates appearance of streptomycin resistance in the organism.

Enhancement of Antibacterial Activity. Increase in antibacterial activity and clinical effectiveness results from application of antibiotic combinations in some but not all instances. In many, lack of enhancement of, or even decrease in therapeutic efficiency of, is observed when combinations of drugs are employed. The degree of antibacterial activity of the blood of patients given an antibiotic mixture may be no greater or may even be less than that which results from the use of the most potent single drug in it.

Infections in Which Combined Antibiotics are Superior to Single Agents—The outstanding example of the superiority of combined chemotherapy over treatment with one antibiotic is tuberculosis.

Although the writer does not recommend combined antibiotic treatment in subacute bacterial endocarditis as a routine procedure, some cases require this kind of therapy.

Brucellosis appears to respond best when treated with tetracycline plus streptomycin for 3 weeks.

It is the author's opinion that influenzal and pneumococcal meningitis are best treated with combined chemotherapy; streptomycin plus a sulfonamide for the former and penicillin together with a sulfonamide for the latter.

The best therapeutic results in infections due to Klebsiella pneumoniae (Friedlander bacillus) are thought to follow use of combinations of antimicrobial agents. Large doses of chloramphenicol plus streptomycin, or a combination of chlortetracycline, oxytetracycline, and chloramphenicol have been used.

Infections in Which Certain Combinations of Antibiotics are Inferior to Single Agents—Addition of a "broad-spectrum" antibiotic to penicillin in treatment of pneumococcal meningitis yields a therapeutic result distinctly inferior to that which follows administration of penicillin alone. Comparison of the treatment of H. influenzae meningitis with chlortetracycline alone and with this agent plus streptomycin and sulfasoxazole (Gantrisin) has revealed that the fever declines at a slower rate and the number of cells in the cerebrospinal fluid remains at high levels for a longer period of time with combined therapy.

Therapy When Etiology is Unknown. The commonest use of antibiotic combinations is for treatment of infections the etiology of which is not immediately apparent. The physician with a patient whom he suspects of having bacterial infection often decides that chemotherapy is necessary. Because the exact cause cannot be immediately determined, more than one agent is given in the hope that this will "cover" the situation; "fixed dose" mixtures are very often used for this purpose. In not a small number of cases, the infectious process is due to some virus and application of any antimicrobial agent is not indicated.

In some instances, administration of antibiotic combinations results in a broadening of antibacterial activity. Recent unpublished observations indicate that such an effect can indeed be produced by the use of two drugs. This has been proved for combinations of penicillin and streptomycin and of erythromycin and sulfisoxazole. It must be emphasized, however, that this phenomenon has followed the use of full therapeutic doses of each drug. If "full dose" combinations are to be given in the absence of a specific bacteriologic diagnosis, the physician must decide, on the basis of the clinical features of the disease, a detailed history, and laboratory investigations (including examination of stained preparations, if possible) not only that a patient has a bacterial infection, but also the type of organism which is most likely to be involved. Under no circumstances must chemotherapy be initiated until all of the necessary bacteriologic investigations have been started: cultures take only a few minutes and cause no significant delay in starting treatment.

The author's practice has been to give penicillin plus streptomycin, in full doses, in instances in which the clinical features of a disease are highly suggestive of a bacterial infection, but in which the specific etiology is not immediately definable. When the possibility of staphylococcal invasion is suspected, full therapeutic quantities of erythromycin plus chloramphenicol are administered.

Chemoprophylaxis

Situations in which use of antimicrobial agents are of value for prevention of infection and those in which they are without benefit are gradually being clarified. It is now clear that chemoprophylaxis is successful and should be employed in streptococcal infections (penicillin or sulfonamide), rheumatic fever recurrences (penicillin or sulfonamide—latest recommendation is for lifetime use), meningococcal meningitis (sulfonamide), surgical dysentery (sulfonamide or chloramphenicol), gonorrhea (penicillin), surgical procedures in persons with valvular heart disease (penicillin, tetracycline, or erythromycin), surgery in tuberculosis (commonly used tuberculostatic agents), and mucoviscidosis (tetracycline).

Equally as significant as definition of the areas in which chemoprophylaxis is effective have been efforts to delineate situations in which attempts

to prevent infection by application of antibacterial agents are fruitless and even potentially dangerous. This represents an important "advance" in the field of chemotherapy because clinical use of such information protects patients against the possibility of harm from drugs which cannot benefit them and decreases the "indiscriminate" use of antibiotics. Presently, it is evident that chemoprophylaxis is without value in elective surgery, uncomplicated obstetrics, viral infections of the upper respiratory tract, "virus" pneumonia, measles, mumps, chickenpox, smallpox, influenza, poliomyelitis, tracheotomy, burns, coma, heart failure, and cerebrovascular accidents.

Decreasing Effectiveness in Chemotherapy

Two types of bacterial infection still pose difficult problems in management and, as a matter of fact, represent areas in which the degree of success in treatment has been decreasing over the past few years. These are staphylococcal disease and infections produced by Gram-negative bacteria. Difficulties associated with treatment of systemic staphylococcal infection are too well known to require more than mention. There is no question that fatality rates of the serious disorders produced by this organism are again approaching the experience of the preantibiotic era in a number of clinics throughout the world. This is in great part related to the increasing number of patients invaded by strains resistant to the commonly available anitmicrobial agents and is the primary motivation behind the search for new antibiotics capable of inhibiting growth of this organism. Occasional strains are isolated which are totally insensitive to all "new" and "old" drugs.

An increasing number of infections due to Gram-negative bacilli, such as E. coli, A. aerogenes, Proteus, and Pseudomonas are being observed. This may be related in many instances to exposure to antimicrobial therapy and development of superinfection due to these organisms. Whether this type of disease appears de novo or as a result of therapeutic manipulation is of less importance than the fact that it is becoming progressively more difficult to treat successfully. The problem here is the same as with staphylococcal disease, that is an increasing number of strains of these bacteria are not inhibited by presently available drugs.

Conclusion

This report is an attempt to review briefly some of the recently developed information in the field of chemotherapy of infection. It is obvious that a great many new problems have been created by the availability of a group of potent agents and that not all of the old ones have been solved. It should be abundantly clear that every new development has not necessarily resulted in improvement in management of infectious diseases and that the

appearance of a new drug has not always led to an "advance" in the effectiveness of treatment. The most important accomplishments in this field have come from proper evaluation of drugs over a sufficient period of time so that all of their properties have been determined under controlled conditions. This kind of information puts the physician in a position to understand and appreciate best all of the problems associated with the use of antibiotics. The significant "advances" in this field have and will continue to come not only from the production of more and more new drugs, but from sufficiently broad experimentation and clinical use to characterize all of the antimicrobial agents, "new" and "old", so completely that they can be applied with the greatest possibility of producing benefit and the smallest risk of causing harm. (L. Weinstein, Recent Advances in the Chemotherapy of Infection: Arch Industr Health, 21: 487-502, June 1960)

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White Plague Not Eliminated!
Suggested Measures for Tuberculosis Control

Tuberculosis continues as a threat to the health of man. Admittedly, the mortality rate from tuberculosis is low, but the morbidity remains significant.

In the Navy, the death rate is essentially nil, but a single case necessitates prolonged treatment, resulting in many sick days with personal and economic losses.

During the past year, there have been epidemics of tuberculosis on two destroyer type ships, one in the Pacific Fleet, the other in the Atlantic. Both epidemics were investigated with the assistance of the Navy Preventive Medicine Units. These epidemics and their investigations have reemphasized the importance of an adequate tuberculosis control program in the Navy. Navy Preventive Medicine Unit No. 2, Norfolk, Va., has devised a protocol for assistance in controlling the transmission of tuberculosis. The protocol outlines suggested procedures to be carried out by the medical department representatives. The salient sections are reproduced for guidance.

1. Methods of Tuberculosis Diagnosis. One must thoroughly familiarize himself with the relative importance of the four tuberculosis case finding "tools" (NavMed P-5052-13)—x-ray, skin test, history, and physical examination. (1) X-Ray: The photofluorographic x-ray survey is useful for routine measures only. For contact studies, the larger 14 x 17 x-ray film should be used when available. The 14 x 17 films should be used for any serial evaluation of men who have positive skin tests. (2) Skin test: Navy "Single Strength" P. P. D., Navy Supply Catalog #6505-299-8171 or #6505-153-8290 should be used and read at 48 and 72 hours for induration. The skin test is most helpful in screening as it enables one to limit the x-ray

survey to only the positive reactors. The appearance of a positive skin test on an individual known to have been a negative reactor at the last testing ("converter") is indicative of infection with Mycobacterium tuberculosis within the intervening period. (3) Adequate medical history. (4) Physical examination: This measure is useful to pick up suspicious or unexplained symptoms and signs in order that the individual concerned may be more closely observed with the first two "tools."

2. Determination of the Area and Population at Risk. With appearance of a case or group of cases, a medical department representative must attempt to delimit insofar as possible the population and area at risk. The population at risk can range from one or two intimate work and social contacts of the known case to an entire compartment or office or even, as in a recent instance, an entire ship's company. The area or areas that need be decontaminated may vary likewise. Do not forget possible contacts that have been transferred; request their commands to take follow-up action.

3. Case Finding. Once limits are established, the most important work of contact studies for case finding is begun. This should consist of skin testing all contacts using "Single Strength" P. P. D. and x-ray examination by 14 x 17 films of all positive reactors. A history and, where applicable, a physical examination should be performed on all contacts. One then should immediately hospitalize all contacts with suspicious chest films and all contacts with histories suggestive enough to make observation without isolation potentially dangerous. For the latter, one must use clinical judgment rather than "rule of thumb." In each of these approaches, it is apparent that comparison of new data with old medical data is of prime importance (i. e., check results of previous chest films, skin tests, et cetera).
NOTE: A report (BuMed Instruction 6310. 4) is to be made with each hospitalization.

4. Follow-up Surveys. Because tuberculosis is often a slow subtle disease (initial studies are usually not positive in infected individuals for at least 6 weeks after contact, and demonstrable disease may not be seen until the 6th or 12th month, or even later), a series of surveys on the population is indicated. It is suggested that x-ray and skin test surveys identical to the initial survey as described above be performed at the end of the 3rd, 6th, and 12th month after the first survey. Any new cases turned up at these times require the above studies on contacts of each case. However, if no new cases appear among the contacts, annual checks (as always, skin testing of known negatives and 14 x 17 chest films on known positives) for 2 more years will suffice after the 12th month. Only after this prolonged survey can a contact be declared free of disease.

5. Decontamination Procedures. Because the disease may be transmitted in dust months after the original contamination, as well as by direct coughing and sneezing, disinfection of a reasonable area used by known cases is necessary. Berthing spaces are a primary target. Work and other areas

should be cleaned only if there has been reasonably extensive use by the known case. Space disinfection is accomplished by a soapy water scrub-down, using a detergent, to remove grease and dust, and repainting of contaminated spaces. The use of phenol or strong antiseptics is not necessary. All bedding, clothing, and personal gear is washed or dry cleaned and exposed to sunlight for 48 hours. Mattresses are autoclaved or incinerated. Pillows are incinerated. It is necessary to replace all filters in air circulating systems and to incinerate the contaminated filters. Stringent performance of usual sanitary precautions elsewhere on the ship or station will suffice to prevent spread by other routes.

6. Summary. Primarily, by a case finding program among a selected population at risk and hospitalization to remove the human sources, and, secondarily, by environmental disinfection practiced with care and attention to detail within a reasonable area, the risk of tuberculosis can be reduced to its absolute minimum. (Tuberculosis Control Section, Preventive Medicine Division, BuMed)

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Safe Handling of Gas Cylinders

Recent observations have pointed up the existence of a serious hazard relative to compressed gas cylinders. One of the greatest abuses appeared to be the lack of consideration for proper handling of oxygen and acetylene bottles.

One truck was carrying three such bottles on a flatbed just to the rear of the cab. The three bottles were standing upright with only a rope tied around the bottles to the truck frame, and secured again to the truck frame at the other end of the rope. One metal bottle had tilted at an angle of approximately 50° from an upright position between another bottle and the truck frame. None of the bottles were fitted with the protective caps as they should have been. A compressed gas cylinder not in use (and especially when being transported) should always be protected by the metal top screw cap. Many serious injuries have resulted due to rough and unsafe handling of this type cylinder.

Each supervisor should insure that every employee under his supervision who is required to use or handle compressed gas bottles in any manner be thoroughly familiar with the hazards involved.

Investigation of an accident at another activity revealed that an exploding oxygen cylinder practically blew two employees to pieces. Parts of the cylinder were blown several hundred yards and through 2-inch steel beams of the building where the explosion occurred. The cylinder was standing on a 5-inch concrete pad. The base of the cylinder was driven through the 5 inches of concrete, and a considerable distance farther into the hard packed earth.

The explosion occurred when an employee attempted to unload an oxygen cylinder from his private automobile. Because of the almost complete disintegration of the gas bottle, the exact cause of the explosion could not be determined. The safety plugs had not been blown. The cylinder did not split, allowing the gas to escape rapidly, as has normally been observed when these cylinders have exploded.

Regardless of the definite cause of the explosion, it still behooves every employee and supervisor handling gas bottles to be thoroughly familiar with the following safe handling principles and methods:

1. Every employee handling these bottles should insure that the bottles always have the caps on when not in use.
2. Oxygen bottles especially should never be handled with greasy gloves or in the presence of oils or grease, as grease or oils in the presence of pure oxygen are highly flammable and, in some cases, explosive.
3. Bottles should never be jarred or bounced while being handled.
4. Bottles should be stored where they cannot come into contact with salt or corrosive chemicals.
5. Never attempt to lift a cylinder with a magnet. When lifting with a crane, always use a cradle or holder.
6. Rolling cylinders is a dangerous practice—use a carrier or tilt slightly and roll on bottom edge.
7. Always avoid placing cylinders where they will be exposed to heat or sun.
8. Never place oxygen cylinders near flammable material.

Check on the handling of these cylinders before an accident happens. (Safe Handling of Gas Cylinders: Safety Review (NAVEXOS P-52), August 1960, Office of Industrial Relations, Navy Department, Washington, D. C.)

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Thermal Decomposition of Ether in Infant Incubator

The observation that infants placed in an incubator after surgery sneezed and coughed, and that a pungent odor was generated within the incubator, led to search for possible irritants. It was found that diethyl ether exhaled by the infant during recovery from anesthesia, could be decomposed by contact with the electrical heating element in the incubator.

In experiments with rabbits recovering from ether anesthesia and placed in the incubator, formaldehyde was found to be produced in concentrations as high as 370 ppm, far exceeding the threshold limits set for industrial atmospheres. Production of such irritants can be avoided with use of a heater so designed that the gases in the incubator do not come into contact with heating elements at high temperatures. (Major M. K. Mendenhall MC USA, et al, JAMA, 11 June 1960)

Eight Points for Food Service Workers

Employees who prepare and serve food need comprehensive and continuous instruction in sanitation.

It is often difficult to convince people of the many dangers inherent in poor sanitation practices. Employees must be convinced that harmful bacteria do exist and, although unseen, are transported from place to place by people, animals, or inanimate objects, such as food.

Sanitary practices are designed to eliminate these harmful bacteria, and the food service employee can do his part by:

1. Keeping himself clean: daily bath, clean clothes; clean hair, covered with a hairnet or cap while on duty; clean hands and fingernails.

2. Reporting illness, sores, or cuts promptly. Food should not be handled by employees who have infected cuts, pimples, or other infections.

3. Keeping all utensils and containers used in cooking, storing, or serving food clean and sanitized.

4. Inspecting food carefully at the time of delivery; thorough washing of fresh fruits and vegetables.

5. Handling food with clean utensils instead of with fingers whenever possible. Making certain that spoons used for tasting are not put back into the food to be served to others.

6. Picking up knives, forks, and spoons by the handle—not by the blade, tines, or bowl.

7. Picking up cups by the handle and glasses by the base—not the rim.

8. Seeing that left-overs are refrigerated promptly and are used as soon as possible. Keep left-overs to a minimum.

(Excerpts from article, Training for Food Service, published in Modern Sanitation and Building Maintenance, July 1960)

Typhoid Fever Outbreak

Recently, an illness which clinically appeared to be an ordinary acute purulent meningitis, proved to be typhoid meningitis. This case ushered in a small outbreak of typhoid fever—water-borne and originating from a carrier at a family reunion at a summer cottage—in an area that for years had been practically free from typhoid fever. Chloramphenicol therapy was employed. Speedy bacteriologic recognition prevented a widespread epidemic. (C. O. Wagenhals, J. Tannenberg, JAMA, 173: 355-359, May 28, 1960)

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