NAVAL MEDICINE

In the Early Nineteenth Century

"Let us endeavor to preserve the health of those who bravely enter the field of battle, or expose themselves on the boisterous ocean in defense of their country." Dr. Edward Cutbush (1808)

Jacket cover: A seaman's voucher for medical treatment at the Marine Hospital, Charlestown, Massachusetts *(Countway Medical Library)*

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A MEDICAL STAFF FOR A NEW NAVY

When Congress authorized the construction of a new American Navy in 1794, it also provided for the employment of naval surgeons. One surgeon and two surgeon's mates were to be assigned to each forty-four gun frigate (CONSTITUTION, for example) and one surgeon and one surgeon's mate were assigned to each thirty-six gun frigate (e.g. CHESAPEAKE). The surgeon's pay, exclusive of prize money, was fifty dollars a month plus rations; his mates received thirty dollars a month, plus rations. By twentieth-century standards, fifty dollars may seem like low pay, but the average skilled laborer in Boston at the time was making only $125.00 per year.

Congress further stipulated that

> *"...a convenient place be set apart for sick or disabled men, to which [the commanding officer] shall have them removed, with their hammocks and bedding, when the surgeon shall so advise, and shall direct that some of the crew attend them and keep the place clean; and if necessary, shall direct that cradles, and buckets with covers, be made for their use..."*

The first naval surgeon to be appointed was George Balfour, surgeon on board CONSTELLATION. The competition for the position was keen since CONSTELLATION was the first of the new American war vessels to be commissioned, and great care had been taken to set up a proper medical facility. Naval practice might also afford a potential opportunity for an adventurous young doctor to see for himself the newer medical practices in Europe.

By the onset of the War of 1812, the United States could boast having about twenty surgeons and twenty-four surgeon's mates. By the war's end in 1815, the number had grown to forty-four surgeons and forty-six mates. However, the British had the awesome number of 855 surgeons and 600 surgeon's mates. This disparity in the numbers of American and British shipboard medical officers was almost as great as the disparity between the number of

American and British vessels of war; at the outbreak of hostilities, the Americans had only twenty-five fighting ships while the British had 900.

In these early years of the American Navy, there was no systematic method for recruiting a ship's surgeon. Those applying for the position first had to be examined and certified by other qualified physicians. The captain would hire the naval surgeon himself, and sometimes the surgeon would follow the captain even when he was transferred to another ship. Today, of course, the physician is assigned to his duty by the Navy Department. Because the captain hired the naval surgeon, the captain also bore some of the responsibility for the health of his crew. By either heeding or ignoring the surgeon's request for better sanitary procedures, extra rations, or supplements to the general diet, the captain had a major responsibility for the crew's health. His decision, therefore, about whether to *listen* to the counsel of his medical officer had almost as much impact on the crew as the surgeon's professional *abilities*. Bearing in mind that the captain's over-riding concern was to keep his ship in readiness for any battle situation, one would assume that he would do as much as possible to keep his crew from being debilitated by illness.

A NAVAL SURGEON'S TRAINING AND RESPONSIBILITIES

Almost all of the practices associated with shipboard medicine in the American Navy evolved from procedures established by the British. By the War of 1812, several important books on naval medicine had been published by British naval surgeons, notably James Lind's *On the Most Effectual Means of Preserving the Health of Seamen in the Royal Navy* (1757) and Gilbert Blane's *Observations on the Diseases of Seamen* (1785). Although both were generally known among American naval surgeons, it took many years before some of their recommendations were adopted on British, much less American, vessels. For example, Dr. Lind's observation that lemon juice could cure scurvy, often the most common shipboard illness, was not adopted as general practice by either navy for about fifty years.

Certificate presented to Benjamin Kissam, naval surgeon, for completing a course in anatomy at Columbia College *(Collection of The USS Constitution Museum)*

In addition to the Lind and Blane publications, a naval surgeon's medical study (often a few years' study with a practicing physician) tried to prepare him for treating the illnesses and injuries he would encounter at sea.

A summary of illnesses, collated from the daily medical log kept by Dr. Pierre St. Medard, surgeon on board the frigate NEW YORK from September 1, 1802, through December 9, 1803, sheds light on the kinds of illnesses typical of an American Navy ship of the period, and their frequency of occurrence:

DIAGNOSIS	*NUMBER OF CASES REPORTED*	*DIAGNOSIS*	*NUMBER OF CASES REPORTED*
Abscess	2	*Hurt on leg*	2
Amputation (of two finger joints)	1	*Hurt in explosion*	9
Angina (sore throat)	1	*Influenza*	4
Bilious Colic	3	*Intermitting Fever*	53
Bilious Fever	15	*Invalid*	2
Beaten	1	*Jaundice*	1
Boils	1	*Leg ulcers*	1
Cachexia (wasting away in the course of a chronic disease)	1	*Liver obstruction*	2
Catarrhal Fever (severe cold)	214	*Lues* (syphilis)	12
Cholera Morbus	1	*Nervous Colic*	1
Concussion	3	*Pain in side*	1
Consumption (tuberculosis)	5	*Pleurisy*	1
Contusion	1	*Pulmonic Fever*	2
Debility	6	*Rheumatism*	42
Diarrhea	51	*Rheumatic Gout*	2
Dislocation	1	*Scurvy*	51
Dropsy	1	*Slow fever*	3
Dysentery	42	*Shot*	3
Dysuria (painful urination)	1	*Sores*	2
Fever	1	*Strangury* (difficult urination)	1
Flagellation (whipping)	1	*Testicular trauma*	1
Fractures	1	*Tumor*	1
Hematemesis (vomiting blood)	1	*Typhus*	10

The 340-man crew of USS NEW YORK cruised from Washington to the Mediterranean, and back, in 435 days, but engaged in no formal sea battles. As the summary indicates, the crew's illnesses were not unusual ones. Catarrhal fever (what we would now call a severe cold) accounted for the largest number of cases — so many that St. Medard devoted almost an entire page of his medical log to its treatment:

On Board of the United States Frigate New York, Capt. Stewart Commd. Morris

Method of Treatment

Remaining	
31 December	2
31 January	10
28 February	4

The Catarrhs having been the prevailing Complaint on this Station I shall on this Case occupy your attention, and particularly on those of a phlogistic character. in this Case I find that Blood letting More or Less according to the nature and Height of the Symptoms, diaphoretic mixture, with Spirit Nitr. dul. & antimonial wine, would in the Course of twenty four hours Correct the diathesis. after having produced an Ease in the System and an indication of a necessity of Repeating the Evacuation of the bilex mucus of the Stomach and Lungs, I would then administer two Grains of Emet. Tart. & about two drachms of antimonial wine sufficient to procure three or four vomitting & one or two downwards discharges. this together with some mild diluent drinks. a little warmed & Sweeten such as Chammomil, Balm, or Barly tea would Rapidly promote a Gentle perspiration. the patient after this treatment being generally relieved from that phlogistic State would give an opportunity of passing a Cathartic Composed of Calomel & Jalap; I have therefore observed this treatment to be the best adapted in this disease, as in a few days the patient would recover his Health and be fit to duty

Entry from the daily medical log kept on board USS NEW YORK *(Collection of The USS Constitution Museum)*

Most of the remaining cases were gastro-intestinal in nature. Dr. St. Medard reported over fifty cases of diarrhea and almost as many cases of dysentery (a more severe and painful form of diarrhea).

The other illnesses — intermitting fever (often malaria), scurvy, rheumatism, bilious fever, and lues (syphilis) — that made up most of Dr. St. Medard's case load underscore how typical the voyage of USS NEW YORK was for its day. In fact, when we compare shipboard illnesses common in the British Navy — the fevers, the fluxes (diarrhea and dysentery), scurvy, rheumatism, consumption, small pox (before 1809), and venereal disease — we find them similar to those found on American ships. The known medical logs for CONSTITUTION indicate a similar cross-section of illnesses, but with one difference: she had only *one* known case of scurvy, the most common and debilitating illness in any navy of the period. This reflects a marked improvement in health at sea since the Revolutionary War.

In his capacity as the ship's chief medical officer, a naval surgeon had other responsibilities as well. Navy regulations in 1809 defined a surgeon's responsibilities this way:

" 1. To inspect and take care of the necessaries sent on board for the use of the sick men; if not good, he must see that they are duly served out for the relief of the sick.

2. To visit the men under his care twice a day, or oftener, if circumstances require it; he must see that his mates do their duty, so that none want due attendance and relief.

3. In cases that are difficult, he is to advise with the surgeons of the squadron.

4. To inform the captain daily of the state of his patients.

5. When the sick are ordered to the hospitals, he is to send with them to the surgeons, an account of the time and manner of their being taken ill, and how they have been treated.

6. But none are to be sent to sick quarters, unless their distempers, or the number of the sick on board, are such, that they cannot be taken due care of; and this the surgeon is to certify under his hand, before removal. If the surgeon of the hospital finds they might have been cured in a little time on board, the surgeon of the ship is to have charged against his wages for every man so sent, ten dollars.

7. To be ready with his mates and assistants in an engagement, having all things at hand necessary for stopping of blood and dressing of wounds.

8. To keep a day-book of his practice, containing the names of his patients, their hurts, distempers, when taken ill, when recovered, removal, death, prescriptions, and method of treatment, while under cure.

9. From the last book he is to form two journals, one containing his physical, and the other his chirurgical practice; which are to be sent to the navy office, at the end of every voyage.

10. Stores for the medical department are to be furnished upon his requisition, and he will be held responsible for the expenditure thereof."

HYGIENE

Dr. Edward Cutbush, the father of American naval medicine *(Annals of Medical History)*

Underlying a surgeon's specific duties was an even greater responsibility: to oversee shipboard hygiene. By the early nineteenth century, surgeons knew that only by strict supervision of the ship's cleanliness and inspection of food and water stores could many illnesses be avoided. The bacterial causes of many diseases were then still unrecognizeable, but well-managed ships had less illness than others.

Any discussion of conditions on board ship led to an examination of the factors which might have contributed to its crew's poor health. Ever-present dampness, poor nutrition, rancid food, foul water, and bad ventilation made the naval surgeon's task of keeping the crew healthy even more difficult. In reaction to some of these problems, Dr. Edward Cutbush, a pioneer in the field of shipboard hygiene, published *Observations on the Means of Preserving the Health of Soldiers and Sailors* (1808). In this first American book on naval medicine, Dr. Cutbush stated:

"This important subject of the prevention of diseases at sea may be summed up in the following leading particulars:

1st. In keeping the ship dry and properly ventilated.

2ndly. In attending to the cleanliness of the crew in their persons and clothing.

3rdly. In their avoiding cold, fatigue and intoxication.

4thly. In keeping them warm by fires in the winter season.

5thly. In preserving an exact and regular discipline, and in furnishing the crew with sound, wholesome provisions and water.

If a contagious disease appear on board:

1st. Separate the sick from the well and prevent all unnecessary communication with the sick berth.

2ndly. Keep the ship clean, dry, and properly ventilated.

3rdly. Let the men avoid cold, fatigue, and intoxication.

4thly. Dissipate moisture betwixt decks by means of fires.

5thly. Avoid depressing the spirits of the people by unnecessary severity.

6thly. Let the berth deck be frequently white-washed with lime."

The summary barely indicates the wide range of Dr. Cutbush's understanding of shipboard hygiene and preventive medicine. Dr. Cutbush also advised the Navy to:

- ☆ build ships with seasoned wood
- ☆ recruit only young and able men
- ☆ use clean ballast
- ☆ fumigate with boiled vinegar
- ☆ avoid unnecessary fatigue and temperature extremes
- ☆ avoid marsh areas when foraging and watering
- ☆ keep port-holes open in port and allow as much ventilation as possible
- ☆ use less salted foods because they have little nourishment value
- ☆ use spring water because it has less decayed animal and vegetable matter
- ☆ clean water casks before filling
- ☆ assign berth numbers and forbid the crew from interchanging hammocks
- ☆ waterproof hats with varnish
- ☆ give each crew member a physical exam
- ☆ avoid the indiscriminate washing of decks and walls
- ☆ appoint a regular day for washing
- ☆ distribute uniforms so that the crew can be dressed appropriate to the season
- ☆ pack food in charcoal or spices instead of salt
- ☆ supplement diet with fresh food whenever possible

Today, we know that lack of attention to any one of these items may cause or aggravate illness. When one considers that many of these problems existed simultaneously, it seems remarkable that men survived the rigors of seafaring life.

TREATMENT OF COMMON ILLNESSES

If the illnesses on board ship were basically routine, so were the methods of their treatment. Medicinals or "drugs" were designed to *counteract* the patient's symptoms chiefly by *purging* the body of whatever was thought to have caused the disease. The following chart indicates some of the common medicinals, how they were classified, their function, and an example of a disease or illness the medicinal might actually have been used for.

MEDICINAL	*CLASS*	*FUNCTION*	*ILLNESS*
Castor Oil (Ricini) *Chinese Rhubarb* (Rhei) *Jalap* *Calomel*	Cathartics (strong laxatives)	To move bowels, in order to rid body of disease-producing materials; used more than any other drug class	All disorders, especially of the gastro-intestinal tract
Laudanum (both contain *Paregoric* opium)	Narcotic	To slow bowel movement and relieve pain	Severe diarrhea and pain
Peruvian Bark (contained quinine)	Astringent	To combat fever and dry, or heal, diseased tissue	Intermittent Fever, and almost all other fevers as well
Acidulated wine	Tonic	To give the body strength and tone	Consumption
Ipecac	Emetic	To induce vomiting	Any severe illness
Cantharides (Spanish Flies)	Epispastic	To raise a blister on the skin, to facilitate loss of disease-producing material	Any severe illness
Pearl Barley	Refrigerant	To cool fevers or reduce inflammation	Any fever
Antimony	Diaphoretic	To increase sweating	Any fever
Mercurial Ointments	Escharotic	To heal sores	Venereal Disease

By trying to purge the body of its illness, or to counteract the symptoms produced by some external cause, such as "bad air" or other contagions, naval surgeons were following standard medical practices of the day. Basically, a doctor tried to cure his patients by attempting to restore the body back to a healthy "humoral" balance. This concept originated with the ancient Greeks, who postulated that the body was healthy only when the four humors (blood, phlegm, black bile, and yellow bile — corresponding respectively to the four natural elements — fire, water, earth, and air) were in appropriate balance. Ill health occurred when one or more of the four humors changed in proportion to the others. The resulting changes manifested as symptoms relating to increases or decreases among the four complementary characteristics: heat, cold, moisture, and dryness.

Medical treatment, therefore, was thought to restore the proper proportions among the humors. For example, if a patient had a "hot" disease, he was thought to have too much blood (the humoral fluid) or fire (the corresponding natural element) in his system. Treatment might therefore include a cooling agent, like pearly barley drink and bleeding. More often, an emetic was used to help throw off whatever had caused the humoral imbalance, and a diaphoretic would help sweat it out.

Within each drug class, the naval surgeon had many treatments from which to choose. The cathartics listed above were used more than any other drugs. It should also be pointed out that the naval surgeon usually kept to the same treatment or regimen. There was neither the time nor space enough to permit more elaborate procedures.

Chinchona Officinalis, or Peruvian Bark, contained quinine and was one of the more commonly used medicinals (Josephi Plenck, *Plantarum Medicinalium)*

A NAVAL SURGEON'S RESPONSIBILITIES IN BATTLE

The Navy regulations of 1809 and Dr. Cutbush's suggestions for maintaining hygienic conditions on ship hardly seem enough to prepare a naval surgeon for the rigors of a battle situation. It has even been said that there was very little that could prepare any doctor for what he would encounter.

After the historic engagement of CONSTITUTION vs. GUERRIERE, Dr. Amos Evans, surgeon on board CONSTITUTION, recorded in his journal:

> *"[Guerriere] had 15 men killed and 62 wounded, most of them very dangerously, immense mischief and destruction having been done by our grape & cannister shot."*

The cannon fire had produced terrible damage: splinters and shrapnel rained down; glass and jagged metal flew; masts toppled; cannons exploded. Projectiles from cannons, coupled with musket fire, created an extremely dangerous situation for all seamen above deck. Evans continued:

> *"We had killed: Wm. S. Bush, 1st Lt. Marines; and Seamen, Jacob Sago, John Brown, Caleb Smith, James Ashford, Robert Brice, James Reed."*
>
> *"Wounded: Charles Morris, 1st Lt., Dangerously; J.C. Aylwin, Master, slightly, Richard Dunn, Seaman, Dangerously; Daniel Lewis, do. do.; Taylor, do. slightly; Mullen, Marine do.; Geo. Reynolds, Seaman, do."*
>
> *"Beside 4 or 5 others so slightly as not to be disabled from coming to Quarters."*

Richard Dunn had to undergo an amputation below the knee for a severe fracture. His recovery was painful, but he did survive the ordeal. Morris, Aylwin, Lewis, and Taylor recovered as well.

If the situation above deck seemed frightening, the scene in the surgeon's cockpit below was even more grim. The cockpit, located just above the ship's hold, but below the

Procedure for a leg amputation (Charles Bell, *Illustrations of the Great Operations of Surgery*)

waterline, was dark, cramped, and foul-smelling. Even under the best of conditions, it was hardly an ideal place for adequate medical care.

But naval surgeons did the best they could. With the roar of cannon and musketfire in the background, they attended their patients — the most severely injured being treated first. Those with multiple injuries, like Richard Dunn, were held down, while their shattered limbs were amputated and cauterized with hot pitch. Bullets and dangerous splinters were removed; wounds were cleaned and dressed. Burns were less frequent battle injuries. Because fire could destroy a ship faster than any cannon shot, the crew tried to extinguish all flames immediately.

Obviously, mortality rates were very high in sea battles. It has been estimated that as many as one-third of the injured died of their wounds. By World War Two, only two to four percent died from their injuries.

HOSPITAL SHIPS AND NAVAL HOSPITALS

As one might expect, the naval surgeon could not treat every sick crew member adequately. The number of sick may have been too great, or an illness might prove unresponsive to treatment.

In order to alleviate the problem, Captain Edward Preble, captain of CONSTITUTION and commodore of the Mediterranean Squadron, authorized, in 1803, the use of hospital ships, and the establishment of an American Naval hospital in Sicily, in 1804. The British had many naval hospitals, but the hospital in Sicily was the first solely for the American Navy. It was also organized by Dr. Cutbush himself. The hospital in Sicily was important in the history of naval medicine in that it was the forerunner for naval hospitals in the United States. In 1811, Congress appropriated $60,000 for the construction of several naval hospitals. It was not until 1822, however, that hospital sites were actually purchased in Boston (Chelsea Naval Hospital), New York, Philadelphia, and Norfolk. It is an interesting footnote of history that the architect who designed the Chelsea Naval Hospital, Alexander Parris, was the same architect who designed the building that now houses the USS Constitution Museum.

AMOS A. EVANS NAVAL SURGEON USS CONSTITUTION

Amos A. Evans, central character in *The Honors or War* presentation, was the most well-known of all of CONSTITUTION's naval surgeons. Evans wrote colorfully and prolifically, making observations on such diverse subjects as the disposition and physical attributes of Boston women to the treatment of British prisoners after the battle between CONSTITUTION and JAVA. His personal reflections are an invaluable resource for specific information about medicine on board CONSTITUTION and life at sea in general.

Evans grew up in Maryland, studied medicine in Philadelphia (one of his teachers was the highly influential physician, Benjamin Rush), and first entered the Navy as a surgeon's mate in 1808. His year of service on board CONSTITUTION, 1812 to 1813, encompasses much of the ship's most colorful history. It is through Evans' writings that we have been able to determine some of the *human* drama during such important battles as CONSTITUTION vs. GUERRIERE and JAVA.

When CONSTITUTION returned to Boston following the victory against JAVA, Evans was transferred to shore duty, serving as surgeon for the Charlestown Navy Yard for the duration of the War of 1812. He also used the time to complete his medical education at Harvard, graduating in 1814. After serving in the Navy for ten more years, Evans returned to his native Maryland and became a country doctor. He died in Elkton, Maryland on January 15, 1848.

Early engraving of the Harvard Medical School, where Dr. Amos Evans, naval surgeon on board USS CONSTITUTION, completed his medical education *(Countway Medical Library)*

HAPPY BIRTHDAY MASSACHUSETTS MEDICAL SOCIETY 1781 - 1981

The USS Constitution Museum is proud to be a part of the Massachusetts Medical Society's Bicentennial Celebration. The exhibit, LIFE AT SEA, includes a slide-tape presentation entitled "The Honors of War," the Museum's first study of medicine at sea. The Museum has joined other institutions across the Commonwealth whose exhibits relate to the history of medicine in Massachusetts.

Other exhibits include:

"In Sickness and In Health: American Patients and Doctors, 1700-1900" The Museum of Our National Heritage, Lexington (May 24 - November 29, 1981).

"Z. B. Adams: Soldier, Surgeon, Scholar" The Public Library, Framingham (opening November 1, 1981).

"Edward Augustus Holyoke" Salem Hospital and Peabody Museum of Salem. May 15 - September 4, 1981.

Other sites planning exhibits include the Berkshire Athenaeum at Pittsfield and Mechanics Hall in Worcester.

Already in print is *Aesculapian Boston*, a listing of all the medical historical sites in the Boston area published by the Paul Dudley White Medical Historical Society at Boston College.

Special events for the Bicentennial Celebration also include World Health Day, October 31, 1981 and a Time Capsule installation at the Boston Medical Library.