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A manual of military surgery - Chapter IV: Medical equipments, stores and hospitals

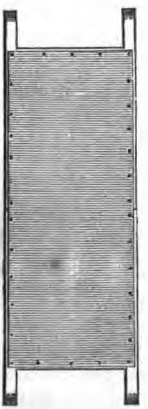
CHAPTER IV.

MEDICAL EQUIPMENTS, STORES AND HOSPITALS.

EVERY regiment, or body of military men, should be amply provided, in time of war, with the means of conveying the wounded and disabled from the field of battle. For this purpose suitable carriages and litters should constantly be in readiness. The carriages should be built in the form of light wagons, drawn each by two horses; with low wheels, easy springs, and a large, wide body, furnished with a soft mattress and pillows, and capable of accommodating not less than eight or ten persons, while arrangements might be made at the side for seating a number more, as in the French *voiture*. As a means of protection against the sun and the rain, it should have a light cover of oil-cloth or canvas.

A great number of *litters*, or bearers, will be found described in treatises on military

surgery; but I am not acquainted with any which combine so much simplicity and cheapness, with lightness and convenience, as one which, after a good deal of reflection, I have just devised, and of which the accompanying sketch affords a good illustration. It consists of two equal parts, connected at the ends by stout hinges, the arrangement being such as to permit of their being folded for more easy transportation on the field of battle. Each part has a side piece of wood, three feet four inches long, by two inches in depth, and an inch and a half in thickness, the free extremity terminating in a slightly curved handle. The side pieces are united by four traverses, and the entire frame is covered with ducking, twenty-four inches in width. Thus constructed, the apparatus is not only very light, so that any one may easily carry it, or, indeed, even three or four at a time, but remarkably con-



venient both for the transportation of patients, and for lifting them in and out of the wagons, which should always be at hand during an engagement. Moreover, by means of side straps, provided with buckles, it will answer extremely well for a bed-chair, so necessary in sickness and during convalescence, the angle of flexion of the two pieces thus admitting of ready regulation. In carrying the wounded off the field, the labor may easily be performed by two men, especially if they use shoulder-straps to diffuse the weight of the burden. The body, in hot weather, might be protected with an oil-cloth, while the face might be shielded from the sun with a veil or handkerchief. A pillow for the head can be made with the coat of one of the carriers.

Besides these means, every regiment should be furnished with an *ambulance*, or, as the term literally implies, a movable hospital, that is, a place for the temporary accommodation and treatment of the wounded on the field of battle. It should be arranged in the form of a tent, and be provided with all the means and appliances necessary for the prompt suc-

cor of the sufferers. The materials of which it consists should be as light as possible, possess every facility for rapid packing and erection, and be conveyed from point to point by a wagon set apart for this object. The ambulance, for the invention and improvement of which we are indebted to two eminent French military surgeons, Percy and Larrey, is indispensable in every well-regulated army.

This temporary hospital should be placed in an open space, convenient to water, and upon dry ground, with arrangements for the free admission of air and light, which, next to pure air, is one of the most powerful stimulants in all cases of accident attended with excessive prostration. The direct rays of the sun, in hot weather, must of course be excluded, and it may even be necessary, as in injuries of the head and eye, to wrap the patient in complete darkness. A properly-regulated temperature is also to be maintained, a good average being about 68° of Fahrenheit's thermometer.

As engagements are sometimes begun after dark, or are continued into the night, an adequate supply of wax candles should be provided,

as they will be found indispensable both in field and hospital practice in performing operations and dressing wounds and fractures. Torches, too, will frequently be needed, especially in collecting and transporting the wounded. Bed-pans, feeding-cups, spoons, syringes, and other appliances usually found in the sick chamber, will form a necessary part of the furniture of such an establishment.

The object of the ambulance is, as already stated, to afford prompt succor to the wounded. Here their lighter injuries are speedily dressed, and the more grave subjected to the operations necessary for their cure. In due time, the former are sent back to the ranks, while the rest are conveyed to suitable lodgings or to permanent hospitals.

As soon as practicable, after the hurry and confusion attendant upon a combat are over, the surgeon should classify the wounded and disabled, taking care that those laboring under similar lesions are not brought in close contact; lest, witnessing each other's sufferings, they should be seized with fatal despondency.

Larrey, in order to meet the exigencies of the grand army in Italy, constructed a *flying*

ambulance; an immense, and, at first sight, a very cumbersome establishment. It consisted of twelve light wagons, on easy springs, for the transportation of the wounded; some with two, others with four wheels. The frame of the former, which were designed for flat, level countries, resembled an elongated cube, curved on the top; it had two small windows on each side, with a folding-door in front and behind. The floor of the body, separable and movable on rollers, was covered with a mattress and bolster. Handles were secured to it laterally, through which the sashes of the soldiers were passed in lifting the sick in and out of the carriage, when, on account of the weather, their wants could not be relieved on the ground. Each vehicle was thirty-two inches wide, and was drawn by two horses; it could conveniently accommodate two patients at full length, and was furnished with several side-pockets for such articles as might be needed for the sufferers.

The large carriage, drawn by four horses, and designed for rough and hilly roads, was constructed upon the same principle as the small; it had four wheels, and could accom-

modate four persons. The left side of the body had two long sliding-doors, extending almost its whole length, so as to permit the wounded to be laid in a horizontal position.

These carriages were used for conveying the wounded from the field of battle to the hospitals of the lines, and combined, it is said, solidity with lightness and elegance.

The number of men attached to the flying ambulance was 113, embracing a soldier's guard with twelve men on horseback, a quartermaster-general, a surgeon-major, with his two assistants and twelve mates, a police officer, and a number of servants. The flying ambulance was, in fact, a costly and imposing establishment, devised by the humanity and ingenuity of the great and good Larrey, who could never do too much for the wounded soldier, and whose presence, like that of his illustrious countryman, Paré, always served to animate the French troops. At one time three divisions of the flying ambulance, equipped upon this grand scale, were upon the field in different parts of Italy.

It is not deemed necessary, in a work like this, to give an account of the construction of

hospitals, properly so termed; for, with the railroad and steamboat facilities which we now possess, there can be little difficulty in obtaining comfortable accommodations for the sick and wounded soldiers. Lodgings can almost always be procured, in nearly every portion of the country where a battle is likely to be fought, in houses, churches, and barns. Temporary sheds might easily be erected in a few hours, with such arrangements as would serve for the more pressing wants of the wounded. The chief points to be attended to, in their construction, are sufficient elevation of the ground floor for the free circulation of air, windows for light and ventilation, and such a position of the fire-place as not to annoy the inmates.

The *medical stores* of the military hospital, whether temporary or permanent, include medicines, instruments, and various kinds of apparatus, as bandages, oiled silk, and splints.

It would far transcend my limits were I to enter fully into all the details connected with these different topics. A few brief remarks under each head must suffice for my purpose.

1st. In regard to *medicines*, a few articles

only, well selected and arranged for ready use, will be necessary. It is bad enough, in all conscience, for a man to be severely shot or stabbed, without physicking him to death. Let him by all means have a chance for his life, especially when he has already been prostrated by shock and hemorrhage. Food and drink, with opium and fresh air, will then do him more good than anything else. I shall enumerate the medicines upon which, in my judgment, most reliance is to be placed in this kind of practice, according to their known effects upon the system.

1. Anodynes:—opium, morphia, and black drop, or acetated tincture of opium.

2. Purgatives:—blue mass, calomel, rhubarb, jalap, compound extract of colocynth, and sulphate of magnesia. Some of these articles should be variously combined, and put up in pill form for ready use.

3. Depressants:—tartrate of antimony and potassa, ipecacuanha, and tincture of veratrum viride.

4. Diaphoretics:—antimony, ipecacuanha, nitrate of potassa, morphia, and Dover's powder.

5. Diuretics:—nitrate and carbonate of potassa, and colchicum.

6. Antiperiodics:—quinine and arsenic.

7. Anæsthetics:—chloroform and ether.

8. Stimulants:—brandy, gin, wine, and aromatic spirits of ammonia.

9. Astringents:—acetate of lead, perchloride of iron and alum, tannin, gallic acid, and nitrate of silver.

10. Escharotics:—nitric acid, acid nitrate of mercury, (Bennett's formula,) and Vienna paste.

2d. The surgical *armamentarium* should also be as simple as possible. It should embrace a small pocket case, with a screw catheter; a full amputating case, with at least three tourniquets, two saws of different sizes, and several large bone-nippers; and, lastly, a trephining case. Several silver catheters of different sizes, a stomach pump, small and large syringes, feeding-cups and bed-pans should also be put up.

3d. Under the head of *apparatus* may be included bandages, lint, linen, adhesive plaster, splints, cushions, wadding, and oiled silk.

The *bandages*, composed of tolerably stout

muslin, should be free from starch and selvage, well rolled, and, on an average, from two inches and a quarter to two inches and a half in width by eight yards in length. The bandage of Scultetus, very serviceable in compound factures, can easily be made, as occasion may require, out of pieces of the common roller.

Of *lint*, the patent, or apothecary's, as it is termed, is the best, as it is soft and easily adapted to the parts to which it is intended to be applied. Old linen or muslin also answers sufficiently well. Charpie is now seldom used.

An abundance of *adhesive plaster*, put up in small cases, should be provided. Collodion will not be necessary.

Splints, of binders or trunk-makers' board, and of light wood, should find a place in every medical store, as frequent occasions occur for their use. In fractures of the lower extremity special apparatus may be required, which, however, as it is cumbrous and inconvenient to carry, may generally be prepared as it is needed.

Cushions are made of muslin, sewed in the

form of bags, of variable size and shape, and filled with cotton, tow, saw-dust or sand. They are designed to equalize and ward off pressure in the treatment of fractures of the lower extremities.

Wadding is a most valuable article in surgical practice, both for lining splints and making pads, as well as in the treatment of burns and scalds, and cannot be dispensed with.

Oiled silk is a prominent article in the dressings of the present day; it preserves the heat and moisture of poultices and of warm water-dressings, at the same time that it protects the bed- and body-clothes of the patient.

Oil-cloth, soft and smooth, is required in all cases of severe wounds and fractures, attended with much discharge.

Air-cushions should be put up in considerable numbers, as their use will be indispensable in all cases of disease and injury involving protracted confinement.

Bran and saw-dust will be found of great value in the treatment of compound fractures, ulcers, gangrene, and suppurating wounds, as

an easy support for the injured limb and a means of excluding flies.

Medical *case-books* should be put up along with the other articles, for the accurate registration of the names of the sick and wounded, the nature of their lesions, and the results of treatment. The medical officers should also keep a faithful record of the state of the weather, the temperature of the air, the nature of the climate, the products of the soil, and the botany of the country through which they pass or in which they sojourn, together with such other matters as may be of professional or scientific interest. The knowledge thus acquired should be disseminated after their return for the benefit of their professional brethren.

Finally, in order to complete hospital equipments, well-trained *nurses* should be provided; for good nursing is indispensable in every case of serious disease, whatever may be its character. The importance of this subject, however, is now so well appreciated as not to require any special comments here.

The question as to whether this duty should be performed by men or women is of no ma-

terial consequence, provided it be well done. The eligibility of women for this task was thoroughly tested in the Crimea, through the agency of that noble-hearted female, Florence Nightingale; and hundreds of the daughters of our land have already tendered their services to the government for this object. No large and well-regulated hospital can get on without some male nurses, and they are indispensable in camp and field practice.

It is not my purpose here to point out the qualities which constitute a good female nurse. It will suffice to say that she should be keenly alive to her duties, and perform them, however menial or distasteful, with promptness and alacrity. She must be tidy in her appearance, with a cheerful countenance, light in her step, noiseless, tender and thoughtful in her manners, perfect mistress of her feelings, healthy, able to bear fatigue, and at least twenty-two years of age. Neither the crinoline nor the silk dress must enter into her wardrobe; the former is too cumbrous, while the latter by its rustling is sure to fret the patient and disturb his sleep. Whisper-

ing and walking on tiptoe, as has been truly observed by Florence Nightingale, are an abomination in the sick chamber. Finally, a good nurse never fails to anticipate all, or nearly all, the more important wants of the sufferer.

Among the things to be specially attended to in nursing is *ventilation*. Persons visiting the sick must at once be struck with the difference of pure air in those chambers where a proper ventilation exists and those where the reverse is the case. To insure this the fresh air should always be admitted from a window not open directly on the bed, or causing the patient to be in a draught. Even in winter it is highly proper that fresh air should be admitted some time during the day when there is a good fire and the patient well protected by covering.

The pillows, bedding, and bedclothes should be well aired and often changed, as also the flannel, under-garments, and night-dress. To facilitate this, it is well, when the patient is very ill and unable to help himself, to have the shirt open all the way down in front, and buttoned up. The patient often escapes great

suffering and annoyance by this simple method. Where there is a discharge from sores or when water-dressings are applied to a limb, it is advisable to place the latter upon a folded sheet with a thin, soft oil-cloth underneath. Great tenderness and cleanliness should be used in dressing wounds or sores. Old linen, muslin, and lint should always be had in readiness for this purpose. A great prejudice exists against the use of muslin, the preference being generally given to linen, but the former is really quite as good as the other, if it is soft and old.

In regard to the *cleanliness* of a sick-room, it is advisable to use a mop occasionally for the removal of flue from under the bed; when, however, the patient is in too critical a situation for dampness, a few tea-leaves scattered over the apartment will absorb the dust, and can be quietly taken up with a hand-brush. A frequent change of bed linen is very beneficial when practicable, and the clothes must always be folded smoothly under the patient. Great cleanliness should be observed in all the surroundings of the sick-room, and particular attention must be paid to the glasses in which medicine is given, in order to render

the doses as palatable as possible. The patient should be washed whenever able, and his teeth and hair well attended to. The body seems infused with new vigor after such ablutions.

A frequent change of *posture* is immensely conducive to the comfort and well-being of a sick person, if performed with a careful eye to his particular condition. Severe pain, loss of sleep, excessive constitutional irritation, and dreadful bed-sores are sure to follow, in all low states of the system, if this precaution be not duly heeded. No patient must have his head suddenly raised, or be permitted to lie high, when he is exhausted from shock, hemorrhage, or sickness. Many lives have been lost by this indiscretion.

The apartment must be free from noise, the light should neither be too freely admitted nor too much excluded, except in head and eye affections, and the temperature must be regulated by the thermometer, from 65° to 68° of Fahrenheit being a proper average.

As the patient acquires strength, he may gradually sit up in bed, propped up at first by pillows, and afterward by a bed-chair.

His food and drink, and also, at times, his medicine, must be given from a feeding-cup during the height of his disease, and a good general rule is to administer them with great regularity, provided this does not interfere too much with his repose. If he is very weak, and sleeps very long, it will be necessary to wake him in order to give him nourishment; but, in general, sleep is more refreshing than food, and more beneficial than medicine. The bed-pan and urinal of course find their appropriate sphere under such circumstances.

As the appetite and strength increase, the patient is permitted to resume, though very gradually, his accustomed diet and to exercise about the room, if not in the open air. After severe accidents and protracted sickness, a wise man will not bestir himself too soon or too much, but court the fickle goddess of health with becoming caution.

Dying patients should be carefully screened from their neighbors, placed in the easiest posture, have free access of air, and be not disturbed by noise, loud talking, or the presence of persons not needed for their comfort. As soon as the mortal struggle is over, the body must be removed.

The *excretions* should be removed as speedily as possible from the apartment, and the vessels in which they are received immediately well scalded, the air being at the same time perfectly purified by ventilation, or ventilation and disinfectants.

Finally, the nurse must take care of herself. She must have rest, or she will soon break down. If she is obliged to be up all night, she should be spared in the day.

CHAPTER V.

WOUNDS AND OTHER INJURIES.

THE injuries inflicted in war are, in every respect, similar to those received in civil life. The most common and important are fractures, dislocations, bruises, sprains, burns, and the different kinds of wounds, as the incised, punctured, lacerated, and gunshot. With the nature, diagnosis, and mode of treatment of these lesions every army surgeon must, of course, be supposed to be familiar; and I shall therefore limit myself,