TRIAGE OF BATTLE CASUALTIES

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ON D-Day the only available means of evacuating the sick and wounded from the British Liberation Army was by Landing Ship Tank (L.S.T.). The staff of many of these ships, which had carried the spearhead formations to the beaches of Normandy, included three naval or military medical officers and a number of orderlies whose role was the care of the evacuated patients on the return journey. The ships were equipped and structurally modified to provide facilities for nursing up to 300 patients on stretchers and for such resuscitation and emergency surgical operations as might prove necessary. During the subsequent weeks a large proportion of the casualties continued to be evacuated by this means.

Adequate staffs and vacant beds were available to deal with casualties requiring urgent treatment. It was essential, however, that the main stream of casualties should pass inland by train or road to other large hospitals from which the widest dispersion could be achieved. The threat of overcrowding of the port hospitals is inherent in such a system. Surgical Officers were appointed at each port to guard against this risk and, as clinical connecting links; to determine with the ships' medical officers the distribution of patients within the administrative pattern. The analogy with any strictly military line of evacuation is apparent.

In any such line officers may find themselves responsible for determining the distribution of large or small numbers of recent casualties. The word "triahe," literally "assessment according to quality," has recently been adopted to describe the process. As the Surgical Officers at one port of disembarkation we have had the opportunity of assessing several thousand recent casualties arriving by L.S.T. within the first forty-five days of the invasion. This somewhat intensive experience forms the immediate background of the present paper.

Successful triage involves the appreciation of three interlinked factors:

1. The number and general character of the patients to be dealt with and to be anticipated.

2. The facilities available for dealing with them. These include the capacity of medical units in terms of beds, staff, specialized units, holding and evacuating facilities and the duration and character of the journey to each unit.

3. The condition of the individual patient. This involves answers to the questions "Can he safely travel and, if so, how far?" and "Is he in need of treatment and, if so, how urgently?"

The third factor alone may appear to present a sufficient problem, involving as it does the whole of clinical surgery; yet on it must be superimposed the other two. These two factors are different in every situation; they vary from day to day and the unexpected size or character of a single convoy may even alter the optimum disposal of similar cases during its triage. It is necessary to bear in mind that a patient who will not suffer from the journey may obtain earlier treatment by being allowed to proceed to a distant hospital than by taking his place at the end of a long queue of more urgent cases in a busy nearby hospital.

Rapidity is usually called for in triage. In the clearance of a L.S.T. it became an operational necessity in order to expedite reloading. We carried out our triage at the rate of twenty
to thirty seconds per lying patient, a rate which did not delay evacuation by the stretcher bearers. Systematic progress along each line of patients is essential and time is saved if the surgeon can be relieved of responsibility for the search for documents, the adjustment of blankets and the labelling of the patient. Every available moment must be spent in acquiring information bearing on the disposal of the patient and the temptation to launch into detailed investigation merely on account of especial interest must be withstood. Maintaining this purpose in our minds we have been surprised at the amount of relevant evidence which it is possible to gather in this very limited period.

The following brief outline of our practice may provide a useful basis to those who may be called upon to carry out similar rapid triage.

**The Assessment of the Individual Patient.**

On approaching the individual patient we have obtained our first indication of the nature of the problem from that invaluable document, the Field Medical Card. It is not practicable at this stage in evacuation to read extensive notes on the average case. Information is required on four points: (1) the date and time of injury; (2) the provisional diagnosis; (3) any operative procedures; (4) any complications.

When this information can be extracted from the card in five seconds the notes are, from the point of view of the triage officer, good. Even with extensive notes the requisite clarity can be achieved by the free use of bold capitals and the underlining of essentials as, for example, where main arteries have been tied or gas gangrene suspected. A few carefully-written notes are of more value to the patient than a mass of indecipherable detail.

Concurrently with this review of the notes we have consciously utilized three features in assessing the general condition. These are the appearance of the face, the rate and volume of the pulse and the response to such a simple question as "How are you feeling?" The manner of the response is more likely to provide an indication of fatigue or toxemia than is its substance, so often the all-embracing "Not so bad." A rapid glance at the tongue is often reassuring or may provide striking evidence of dehydration. The "tongue like a piece of carpet" precludes further travel.

**Local Condition.**

As in other campaigns the majority of wounds have affected the soft tissues of the extremities without involving bone or other important structures. Their number alone justifies a somewhat detailed account of their investigation. Similar technique in the search for evidence of the same pathological processes (hæmorrhage, infection, etc.) is in general applicable to such comparable areas as the chest wall and back.

**Limbs.**—Particularly under the conditions which exist in the L.S.T., the removal of dressings would have been dangerous and unduly time-consuming. We are satisfied from hospital reports that the omission of this step has not led to significant errors in triage at this level. The appearance of the dressing is a sufficient index of recent external hæmorrhage. A deliberate search is made for swelling, tenseness, tenderness or discoloration of the tissues surrounding the wound. The onset of pain in a previously comfortable wounded limb often indicates hæmorrhage or infection. The examination is completed by ensuring that the digits are warm and capable of active movement. In the presence of any adverse signs the patient requires full examination and probably active treatment. Material interference with the vascular supply and gas infection demand immediate attention. The majority of the remainder who show adverse signs are, however, fit to travel, and only complete familiarity with the facilities and existing pressure of work on the line of evacuation will enable the triage officer to secure the most expeditious handling of these second priority cases. At this level the existence of a nerve lesion calls only for the suitable protection of the heel or other anesthetic pressure point. A patient on whom a primary operation has been carried out need be withdrawn from the stream of evacuation only on account of complications.

There remains a large number of patients whose limb wounds show no evidence of compli-
cations but which have received no treatment other than simple dressing. Here the time
factor, the period since wounding, becomes important. The surgery required in these cases
merges, as the hours pass, from early excision, through later trimming, to prophylactic
drainage at periods up to say forty-eight hours. In many, cleansing under good conditions
is the sole requirement. These patients must usually be passed into the line of evacuation
but, in quiet periods, their treatment in forward hospitals will materially reduce the duration
of their disability and conserve manpower. This war, like the last, may well have to be won
by les petits blessés.

When a limb is encased in plaster of Paris the available evidence is restricted. A useful
opinion can, however, usually be formed by considering the general state of the patient, the
presence or absence of pain, the circulation and function of the digits, the smell, and the signa-
ture of the responsible surgeon.

The recognition of the involvement of a joint by a wound is often difficult during triage.
It is necessary to provide for immobilization and possible surgical intervention, especially in
the case of the knee joint, before further evacuation is permitted. The only problem added
by the existence of a fracture is that of immobilization. Multiple manipulations prior to the
patient's arrival at the hospital undertaking definitive treatment have given poor results.
The compound fracture of the femur occupies a unique position, in that adequate early
immobilization is life-saving and that the modern treatment by skeletal traction virtually
precludes inter-hospital transfer. There are thus strong indications for expediting the on-
ward evacuation of a well-immobilized case to a hospital where the patient will be held
throughout treatment.

Head.—The triage of head wounds is rendered difficult by the fact that penetration of the
skull can be excluded only by radiological examination or by an exploration of the wound and
is rendered easy by the fact that few patients suffer by a delay of several hours. A head
wound can be accepted as trivial only when penetration of the skull has been fully excluded.
Only in the exceptional head injury will unconsciousness or evidence of compression preclude
travel to the nearest available neuro-surgeon for operative treatment.

Spine.—The patient suffering from a fracture of the spine can usually travel in the stream of
casualties if urination is adequately provided for, by suprapubic drainage if necessary, and
if suitable precautions are taken to avoid the occurrence of bed sores.

Face and Jaws.—The general and local condition of most patients with major wounds of the
face and jaws has allowed of their being passed through to the nearest Maxillo-Facial
Unit. The threat of suffocation by the backward-falling tongue associated with a badly
smashed jaw may constitute an extreme emergency. Where there is no conveniently sited
Maxillo-Facial Unit, early stabilization of the bony framework by nearby general and dental
surgeons may be necessary.

Eyes.—The preservation of sight in an eye is so important and the conservative surgery
of the eye so specialized that the location of the nearest ophthalmic surgeon must be known
to the triage officer. Injury to both eyes or the suspicion of a penetrating wound of either
globe has earned high priority in disposal. Our only exception has been where secure evidence
existed that only one eye was damaged and that irretrievably. Under these circumstances
operative treatment is not urgent within the first ten days.

Chest.—It is now accepted that most patients with penetrating wounds of the chest
travel well. Apart from the sucking wound, rare at this level, the urgent cases are those with
active intrathoracic haemorrhage, a large effusion or a tension pneumothorax. The available
evidence of these complications will be dyspnoea, a poor and rapid pulse and pallor or cyanosis.
To those not called upon to carry out their triage in the noisy tank deck of a L.S.T. the
familiar local clinical signs will be available if confirmation is required. A brief question
regarding pain and a hand on the abdomen are wise precautions to exclude the dangerous
and urgent thoraco-abdominal wound in which an incomplete diagnosis is so apt to be made.

Abdomen.—So much has been written about penetrating wounds of the abdomen that
little need be said regarding their disposal. They represent a small but dramatic proportion
of wounds requiring competent surgery as early and as far forward as is compatible with the patient being held for ten days after operation. Thereafter they travel well.

Back.—The majority of wounds of the back which demand urgent treatment do so by virtue of penetration of the pleura, peritoneum or spinal theca. The remainder are dealt with on the lines for the soft tissue wounds of the limbs.

Buttock.—Two major hazards exist in wounds of the buttock: the penetration of peritoneum, rectum or bladder and the development of gas infection. When any immediate surgery is available for uncomplicated flesh wounds some priority is well given to those of the buttock.

Burns.—Almost all burns have been confined to the face and hands. In contrast to the experience of the Middle East they have constituted a small problem in terms both of numbers and of severity. Clinical examination in triage is largely confined to the inspection of the tongue and the feeling of the pulse, the latter often most accessible in the brachial artery. Extensive burns travel notoriously badly.

Gas Infection.—In triage, gas infection has occupied a position of peculiar importance. These cases are very liable to be overlooked in their early stages by a medical officer responsible for a large number of patients. Among these he naturally tends to devote his attention to those suffering from wounds carrying an obvious threat to life. Gas infection may meantime be developing insidiously in a limb-wound, initially and, at that time rightly, accepted as uncomplicated. The threat of gas infection has coloured our approach to every wound. The final review of all patients prior to their dispersal has disclosed not a few cases of actual and potential gas infection. Our first indication of this has usually been that the patient has appeared more exhausted or toxic than seemed warranted by the nature of the wound. An unduly rapid pulse, otherwise unexplained, or a complaint of pain of recent onset arouses suspicion. Local manifestations have been a serum-soaked dressing, superficial oedema with pallor or with reddish or brownish discoloration of the skin, and general or local swelling of the part with intense tenderness of similar distribution. Crepitus and the over-stressed characteristic odour have sometimes been present. Established gas infection places the patient in first priority. It is desirable to provide early investigation and prophylactic decompressive surgery for the penetrating wound associated with a tense haematoma of the calf, thigh, buttock or shoulder, those happy hunting grounds of the anaerobe.

Walking Wounded.—As might be expected very few among the 37 per cent of casualties who formed the “walking wounded” were unfit for onward transit. Their review was, however, justified by the exceptions which have included patients suffering from wounds of eye, mandible and skull, and the occasional soldier who, despite the most severe injury to an upper limb, is too proud to lie down. The all-important function of a right hand may be saved by early treatment when such is possible.

Medical Conditions.—Among the “medical patients,” all have been fit to travel onward, with the exception of the occasional case of pneumonia or of high fever and a very few exceptionally severe psychiatric casualties.

Surprisingly, in view of the vicious motion of the L.S.T., sea-sickness did not constitute a common or difficult problem in differential diagnosis in our experience. Two other complaints, backache and abdominal discomfort, were extremely frequent among all types of lying patients. The former was clearly due to the prolonged recumbency on a stretcher; the latter was generally attributed by the sufferers to constipation.

Of the casualties seen by us 6·3 per cent were sent for immediate treatment; 84·7 per cent travelled on directly by hospital train; 9 per cent went to the intermediate road-transit hospital which could be reached within an hour from the port. This last figure was higher than might have been expected owing to the presence there of specialized surgical teams for neuro-surgery and maxillo-facial injury.

The following conditions include the majority of those earning first priority: Active hæmorrhage; gas infections; interference with the circulation in a limb; penetrating wounds of the eye; penetrating wounds of joints not immobilized; compound fracture of
femur inadequately immobilized; paraplegia requiring suprapubic cystostomy; complicated penetrating wounds of chest; penetrating wounds of abdomen unless convalescent; extensive burns; severe toxæmia or collapse from whatever cause.

Triage can never, however, consist of making a clinical diagnosis, applying to a list, and reading off the patient's disposal. Its purpose is the dispersal of patients in such a way that evacuation is expedited and yet that the fullest possible use is made of forward surgical facilities for patients who will benefit thereby, either by the saving of life or the reduction of the extent or duration of disability.

SUMMARY.

A brief account is given of the administrative and clinical inter-relationship existing at a port of disembarkation of casualties arriving from Normandy by L.S.T.

The particular clinical features found to be of value in the rapid assessment of battle casualties for purposes of disposal are described.

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