Chapter 3

# Triage

**Introduction**

Modern combat casualty evacuation has become so immediate and efficient that it can result in a mass casualty situation at military treatment facilities (MTFs) within the military medical care system. Consequently, a method of dealing with the conflicting factors of severity of injury, the tactical situation, the mission, and the resources available for treatment and evacuation is essential. **Triage is an attempt to impose order during chaos and make an initially overwhelming situation manageable.**

> **Triage is the dynamic process of sorting casualties to identify the priority of treatment and evacuation of the wounded, given the limitations of the current situation, the mission, and available resources (time, equipment, supplies, personnel, and evacuation capabilities).**

Triage occurs at every level of care, starting with buddy and medic care, extending through the OR, the ICU, and the evacuation system.

> **The ultimate goals of combat medicine are the return of the greatest possible number of soldiers to combat and the preservation of life, limb, and eyesight in those who must be evacuated.**

The decision to withhold care from a wounded soldier who in another less overwhelming situation might be salvaged, is difficult for any surgeon or medic. Decisions of this nature are infrequent, even in mass casualty situations. Nonetheless, this is the essence of military triage.

**Triage Categories**

It is anticipated that triage will be performed at many levels, ranging from the battlefield to the battalion aid station to the field hospital. Traditional categories of triage are **Immediate, Delayed, Minimal, and Expectant**. This classification scheme is useful for mass casualties involving both surgical and medical patients. An additional category of **Urgent** has been used to describe surgical patients who need an operation but can wait a few hours.

- **Immediate**: This group includes those soldiers requiring life-saving surgery. The surgical procedures in this category should not be time consuming and should concern only those patients with high chances of survival (eg, respiratory obstruction, unstable casualties with chest or abdominal injuries, or emergency amputation).
- **Delayed**: This group includes those wounded who are badly in need of time-consuming surgery, but whose general condition permits delay in surgical treatment without unduly endangering life. Sustaining treatment will be required (eg, stabilizing IV fluids, splinting, administration of antibiotics, catheterization, gastric decompression, and relief of pain). (The types of injuries include large muscle wounds, fractures of major bones, intra-abdominal and/or thoracic wounds, and burns less than 50% of total body surface area (TBSA).
- **Minimal**: These casualties have relatively minor injuries (eg, minor lacerations, abrasions, fractures of small bones, and minor burns) and can effectively care for themselves or can be helped by nonmedical personnel.
- **Expectant**: Casualties in this category have wounds that are so extensive that even if they were the sole casualty and had the benefit of optimal medical resource application, their survival would be unlikely. The expectant casualty should not be abandoned, but should be separated from the view of other casualties. Expectant casualties are unresponsive patients with penetrating head wounds, high spinal cord injuries, mutilating explosive wounds involving multiple anatomical sites and organs, second and third degree burns in excess of 60% TBSA, profound shock with multiple injuries, and agonal respiration. Using a minimal but competent staff, provide comfort measures for these casualties.

**Alternative Triage Categories**

In practice, however, the division of patients into these four categories is not useful for a surgical unit. The casualties should be divided into emergent, nonemergent, and expectant. These divisions are useful in dividing casualties into those requiring further surgical triage (emergent), and those that are less injured, still require care, but have little chance of dying (nonemergent). It is anticipated that 10%–20% of casualties presenting to a surgical unit will be in the emergent category, requiring urgent surgery. The vast majority of wounded will not require intensive decision-making, intervention, and care.

- **Emergent**: Although this category has been historically subdivided into **Immediate** (unstable and requiring attention within 15 minutes) and **Urgent** (temporarily stable but requiring care within a few hours), except in the most overwhelming circumstances, such division is rarely of practical significance. This group of wounded will require attention within minutes to several hours of arriving at the point of care to avoid death or major disability.
  - Types of wounds include:
    - Airway obstruction/compromise (actual or potential).
    - Uncontrolled bleeding.
    - Shock.
      - Systolic BP < 90 mm Hg.
      - Decreased mental status without head injury.
    - Unstable penetrating or blunt injuries of the trunk, neck, head, and pelvis.
    - Threatened loss of limb or eyesight.
    - Multiple long-bone fractures.
- **Nonemergent**: This category was historically divided between **Delayed** (would require intervention, however, could stand significant delay) and **Minimal**. This is the group of patients that, although injured and may require surgery, does not require the attention of the emergent group and lacks significant potential for loss of life, limb, or eyesight. Examples include:
  - Walking wounded.
  - Single long-bone fractures.
  - Closed fractures.
  - Soft tissue injuries without significant bleeding.
  - Facial fractures without airway compromise.

- **Expectant**: This group of wounded, **given the situation and resource constraints**, would be considered unsalvageable. Examples may include:
  - Any casualty arriving without vital signs or signs of life, regardless of mechanism of injury.
  - Transcranial gunshot wound (GSW).
  - Open pelvic injuries with uncontrolled bleeding; in shock, with decreased mental status.
  - Massive burns.
- **Special categories**: Patients who do not easily fit into the above categories and casualties who pose a risk to other casualties, the medics, and the treatment facility, may require special consideration:
  - **Wounded contaminated in a biological and/or a chemical battlefield environment.** The threat posed by these patients mandates decontamination prior to entering the treatment facility. Appropriately protected medical personnel may treat emergent casualties prior to decontamination.
  - **Retained, unexploded ordnance:** These patients should be segregated immediately. See Chapter 1, Weapons Effects and Parachute Injuries, which describes the special handling of these wounded.
  - **Enemy Prisoners of War (EPWs)/Internees:** Although treated the same as friendly casualties, it is essential that the threat of "suicide bombers" and "human booby traps" be prevented by carefully screening all EPWs prior to moving into patient areas, including the triage area. See Chapter 34, Care of Enemy Prisoners of War/Internees.
- **Combat stress:** Rapid identification and immediate segregation of stress casualties from injured patients will improve the odds of a rapid recovery. With expeditious care these casualties can be returned to duty (80%). Do not use them as litter bearers as this may increase the trauma you seek to treat.
  - **Place patient in one of two groups.**
    - **Light stress**: Immediate return to duty or return to unit or unit's noncombat support element with duty limitations and rest.

- **Heavy stress:** Send to combat stress control restoration center for up to 3 days reconstitution.
- Use **BICEPS** mnemonic where resources/tactical situations allow.
  - **Brief**: Keep interventions to 3 days or less of rest, food, reconditioning.
  - **Immediate**: Treat as soon as symptoms are recognized—do not delay.
  - **Central:** Keep in one area for mutual support and identity as soldiers.
  - **Expectant**: Reaffirm that we expect return to duty after brief rest; normalize the reaction and their duty to return to their unit.
  - **Proximal**: Keep them as close as possible to their unit. This includes physical proximity and using the ties of loyalty to fellow unit members. Do this through any means available. **Do not evacuate away from the area of operations or the unit, if possible.**
  - **Simple**: Do not engage in psychotherapy. Address the present stress response and situation only, using rest, limited catharsis, and brief support (physical and psychological).
  - Or, refer: Must be referred to a facility that is better equipped or staffed for care.

**If battlefield casualties do not have physical injuries, DO NOT send them out of the battle area, as this will worsen stress reactions, and possibly start evacuation syndromes!**

**Triage is a fluid process at all levels, with altered situations and resources requiring a change in category at any time and in any setting. In the extreme example, a casualty may be triaged from emergent to expectant during surgery, abruptly terminating the procedure ("on-the-table triage").**

**Resource Constraints**

Including all of the factors that influence triage decision making would be encyclopedic and of little benefit. Rather, a

framework for thinking about this process in a logical fashion is presented here.

- **External factors.** The surgeon/medic may have limited knowledge of and no control over external issues. Nonetheless, optimal casualty care requires at least an assessment of these factors.
  - **Tactical situation and the mission.** The decision to commit scarce resources cannot be based on the current tactical/medical/logistical situation alone. One severely wounded, resource-consuming casualty may deplete available supplies, and thus prevent future, less seriously injured casualties from receiving optimal care. Liaison with the tactical force operating in your area is essential to making sound triage decisions. Operational security may make this kind of information difficult to obtain in a timely fashion. **Education of, and communication with, line commanders about the critical nature of this information is essential.**
  - **Resupply**: Having a sense of how and when expended internal resources will be resupplied may prove critical to making the decision to treat or not treat the individual casualty.
  - **Time.**
    - **Evacuation to the MTF.** The shorter this time interval, expect the complexity of triage decisions to increase, especially sorting the worst emergent patients from the expectant. Longer intervals will result in the opposite, with "autotriage" of the sicker patients from the emergent to the expectant/dead on the battlefield category.
    - **Time spent with the individual casualty.** In a mass casualty situation, time itself is a resource that must be carefully triaged/husbanded. All patients receive an evaluation, but only some receive operative intervention. Time on the OR table is usually the choke point. Apply the concepts of damage control to minimize the time casualties spend in surgery. On-table triage to expectant may be necessary due to deteriorating casualty physiologic response and/or the pattern of injury (aorta-vena cava GSW, dual

exsanguination sites, extensive pancreatic-duodenal injury, and so forth).

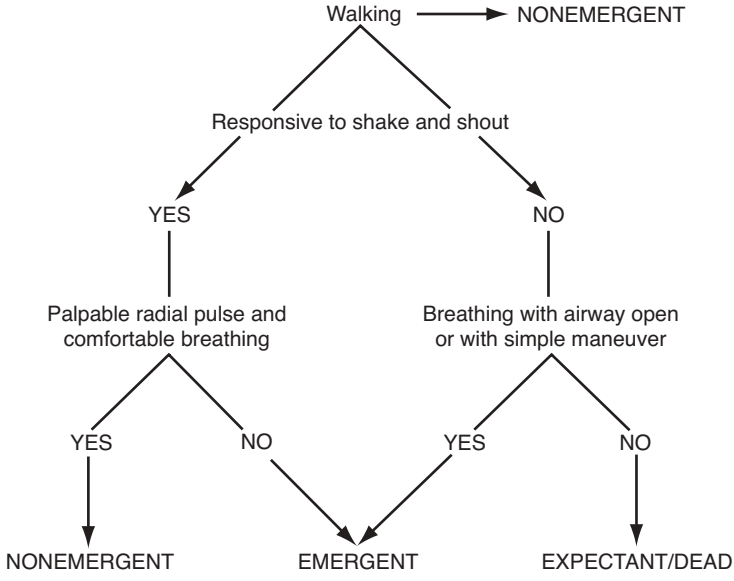
- ♦ **Evacuation out.** Casualties must move expeditiously to the next echelon of care (EOC), otherwise valuable local resources will be consumed in maintaining patients, thereby preventing additional patients from receiving care.

- **Internal factors.** These issues are known to the surgeon/nurse/medic and should be factored into triage decisions.
  - o **Medical supplies.** These supplies include equipment, drugs, oxygen, dressings, sutures, sterilization capability, blood, etc. **Immediate** liaison with the logistics system in the MTF and the theater of operation is essential to ensure the availability and timely resupply of these items, to include "surge" capabilities and local resource availability.
  - o **Space/Capability.** This category includes the number of OR tables and ICU beds: the holding capacity and ward capacity; and the available diagnostic equipment—ultrasound (US), X-ray, computed tomography (CT)—and laboratory tests. For example, if your MTF has the only CT scanner in theater, plan for an increased number of head-injured patients.
  - o **Personnel.** This includes knowing the professional capability (type and experience of individual physician/nurse/medic), and the emotional stability, sleep status, and so forth, of your hospital personnel. This perishable resource must be preserved; for example, 24 hours of continuous operation may exhaust your only OR crew, and may necessitate diversion of casualties to another facility.
  - o **Stress.** Soldiers, including medical personnel, are affected by the consequences of war; individual and unit capability is degraded during sustained operations. The personal impact of military triage on the medical team cannot be overemphasized. It is extremely emotional, and measures should be undertaken to minimize these effects. This is best provided by trained staff. Cohesive groups may tolerate stress better and assist each other in dealing with traumatic events when allowed to

process the event in a group format according to their own traditions.

**Triage Decision Making**

The complexity of decision making in triage varies greatly, often depending on the level of training and experience of the triage officer, as well as the location where the triage decision is being made. At the front line, the medic must make a decision about whether or not to evacuate patients from the battlefield and how fast. The following decision tree is an example of a triage tool that may be used in the field as an initial decision-making aid.




In the emergent treatment area, the surgeon must make decisions about whether surgery is needed, the timing of the surgery, and the priority of multiple surgical patients. Regardless of the type of triage decision needed, the following information is of critical importance in reaching that decision:

- **Initial vital signs.** Pulse (rate and quality), mentation, difficulty breathing (eg, a casualty with normal mentation

and radial pulse quality is nonemergent). Respiratory rate alone is not predictive of the appropriate triage category.

- **Pattern of injury.** A historical perspective aids the triage decision maker in understanding the distribution of wounds encountered on the modern battlefield and the likely mortality associated with those wounds. **The majority of combat wounded will suffer nonfatal extremity injuries**. In general, these will be triaged as nonemergent.
- **Response to initial intervention.** Does the shock state improve, remain unchanged, or worsen with initial resuscitative efforts? A patient who fails to respond rapidly to initial fluid resuscitation should be triaged ahead of a patient with a good response to minimal fluid replacement; alternatively, this nonresponder in a mass casualty situation may need to be placed in the expectant category.
- The following data from the Vietnam War indicate the numerical distribution of diagnoses that were seen in the low-intensity light-infantry combat that characterized that war. Casualties from armored combat can be expected to have a higher prevalence of burns and multiple injuries. Of 100 injured in combat:
  - **30%—Minor or superficial wounds** (minor burns, abrasions, intraocular foreign body, ruptured tympanic membrane/deafness).
  - **16%—Open comminuted fractures of a long bone.** Several patients with multiple fractures and injuries to named nerves and blood vessels.
  - **10%—Major soft tissue injury or burn** requiring general anesthesia for treatment. Several had an injury to major nerves.
  - **10%—Had laparotomies,** two of which were negative, and several involved extensive, complicated procedures.
  - **6%—Open comminuted fractures of hand, fingers, and feet.**
  - **5%—**Required closed thoracostomy and had soft tissue wounds.
  - **4%—Major multiple trauma.**
  - **3%—Major amputations** (above the knee [AK], below the knee [BK], below the elbow [BE], above the elbow [AE]). In three out of four cases, the surgical procedure simply required completion of the amputation.

- **3%—Craniotomies.** Two were for fragments and one for a depressed skull fracture.
- **3%—Vascular repair** (one was to repair a femoral artery, and another involved named nerves or fractures).
- **3%—Major eye injuries,** one involving enucleation.
- **2%—Minor amputations** (toes, fingers, hand, foot).
- **2%—Maxillofacial reconstructions** (one half were mandibular injuries, and most of the rest were maxillary).
- **1%—Formal thoracotomy.**
- **1%—Neck exploration.**
- **1%—"Miscellaneous."**

Data from more recent American combat operations in Iraq (OIF) and Afghanistan (OEF), 2003–2004, indicating the spectrum of injury type (Table 3-1), mechanism (Table 3-2), and anatomical location (Table 3-3) are found below.

**Table 3-1. Type of Injury.***

| Type of Injury | Frequency | Percent |
|---|---|---|
| Penetrating | 645 | 35.7% |
| Blast | 425 | 23.5% |
| Blunt | 410 | 22.7% |
| Unknown | 84 | 4.6% |
| Crush | 63 | 3.5% |
| Mechanical | 49 | 2.7% |
| Thermal | 48 | 2.7% |
| Undetermined | 21 | 1.2% |
| Other | 16 | 0.9% |
| Chemical agent | 10 | 0.6% |
| Bites/Stings | 8 | 0.4% |
| Degloving | 8 | 0.4% |
| Electrical | 7 | 0.4% |
| Heat Injury | 7 | 0.4% |
| Inhalation | 3 | 0.2% |
| Multiple Penetration System | 3 | 0.2% |
| **Total** | **1807** | **100%** |

* A casualty may have more than one type of injury. These numbers are based on 1530 Level III casualties.

**Table 3-2. Mechanism of Injury.***

| Mechanism of Injury | Frequency | Percent |
|---|---|---|
| IED | 310 | 18.4% |
| MVA | 207 | 12.3% |
| Gun Shot Wound (GSW) | 188 | 11.1% |
| Grenade (includes RPG) | 170 | 10.1% |
| Shrapnel/Fragment | 141 | 8.3% |
| Unknown | 119 | 7.0% |
| Machinery or Equipment | 95 | 5.6% |
| Fall or Jump from height | 90 | 5.3% |
| Mortar | 84 | 5.0% |
| Burn | 53 | 3.1% |
| Aggravated Range of Motion | 31 | 1.8% |
| Landmine | 29 | 1.7% |
| Other | 27 | 1.6% |
| Knife or other sharp object | 21 | 1.2% |
| Helicopter Crash | 19 | 1.1% |
| Blunt object (eg, rock or bottle) | 17 | 1.0% |
| Pedestrian | 16 | 0.9% |
| Free Falling Objects | 14 | 0.8% |
| Bomb | 12 | 0.7% |
| None | 12 | 0.7% |
| UXO | 10 | 0.6% |
| Environmental | 9 | 0.5% |
| Exertion/overexertion | 5 | 0.3% |
| Flying debris | 5 | 0.3% |
| Building Collapse | 2 | 0.1% |
| Hot Object/Substance | 2 | 0.1% |
| Altercation, fight | 1 | 0.1% |
| **Total** | **1689** | **100%** |

* A casualty may have more than one mechanism of injury. These numbers are based on 1530 Level III casualties.

## Setup, Staffing, and Operation of Triage System

- Initial Triage Area.
  All casualties should flow through a **single triage area** and undergo rapid evaluation by the **initial triage officer**. Casualties will then be directed to separate treatment areas (emergent, nonemergent, and expectant), each with its own triage/team leader. The expectant will have a medical attendant, ensuring optimal pain control. The dead should

**Table 3-3. Anatomical Location of Injury.***

| Anatomical Location | Frequency | Percent |
|---|---|---|
| Multiple Sites | 761 | 49.7% |
| Lower Extremity | 248 | 16.2% |
| Upper Extremity | 223 | 14.6% |
| Head/Face | 174 | 11.4% |
| Thorax/Back | 48 | 3.1% |
| Neck | 20 | 1.3% |
| None | 20 | 1.3% |
| Abdomen | 16 | 1.0% |
| Unknown | 9 | 0.6% |
| Buttock | 6 | 0.4% |
| N/A | 3 | 0.2% |
| Genitalia | 1 | 0.1% |
| Soft Tissue | 1 | 0.1% |
| **Total** | **1530** | **100%** |

* Casualties with more than one injury location are included in 'Multiple Sites'. These numbers are based on 1530 Level III casualties.

be sent to the morgue and must remain separate from all other casualties, especially the expectant. Unidirectional flow of patients is important to prevent clogging the system. Reverse patient flow in any treatment area is highly discouraged.

**No significant treatment should occur in the triage area. Casualties should be rapidly sent to the appropriate treatment area for care.**

- Qualities of an ideal initial triage area should include
  - **Proximity** to the receiving area for casualties—LZ, ground evacuation, decontamination area.
  - **One-way flow** both into and out of the triage area through separate routes to **easily identified, marked** (signs, colors, chemical lights, etc.) treatment areas.
  - **Well-lit, covered, climate-controlled** (if possible) area with sufficient space for easy access, evaluation, and transport of casualties in and out.
  - Dedicated **casualty recorders** to identify, tag, and record initial triage/disposition.

- ◊ Using an indelible marker to place numbers on the casualty's forehead is an easy, fast way to track patients. Any method that is reproducible and simple will suffice.
- ◊ If resources allow, casualty tracking may include stationing administrative personnel at every entry/exit.

♦ Sufficient **litter bearers** (controlled by an NCO) to ensure continuous casualty flow.

o Initial triage office.

♦ Ideally, a surgeon experienced in dealing with combat trauma should be used in this capacity. Unfortunately, using a surgeon outside of the OR is a luxury that most small forward surgical units cannot afford.

♦ It is essential that another person with clinical experience be trained to assume this function. Using mass casualty exercises or limited mass casualty situations is one way to train/identify the right person to fill this role in the absence of a surgeon.

● Emergent treatment area.

o Setup.

♦ Close proximity to initial triage area with direct access.

♦ Administrative personnel stationed at entry and exit doors to record patient flow. Ideally, a display board or a computer should be used to record patient identity, location, and disposition.

♦ Series of resuscitation bays (number depends on available resources/personnel).

- ◊ Allow sufficient room for 3-person team to work.
- ◊ Easy access in and out of bay.
- ◊ Availability of equipment needed for ATLS style resuscitation (Fig. 3-1 a,b).

o Staffing.

♦ Team leader: a surgeon serves as the surgical triage officer.

- ◊ Responsible for determining priority for operative interventions.
- ◊ Needs to identify patients that require early evacuation.
- ◊ If a surgeon is unavailable, may be a physician who maintains close communication with the operating surgeons.

♦ Administrative person. Responsible for recording flow of patients through unit.

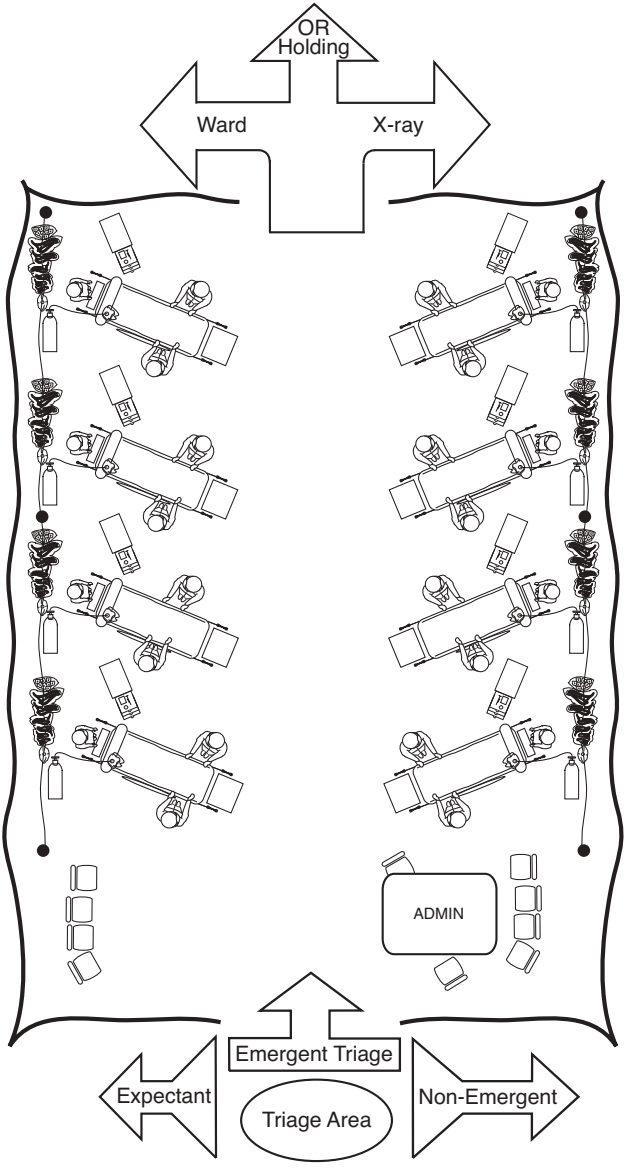



**Fig. 3-1a.** Triage.

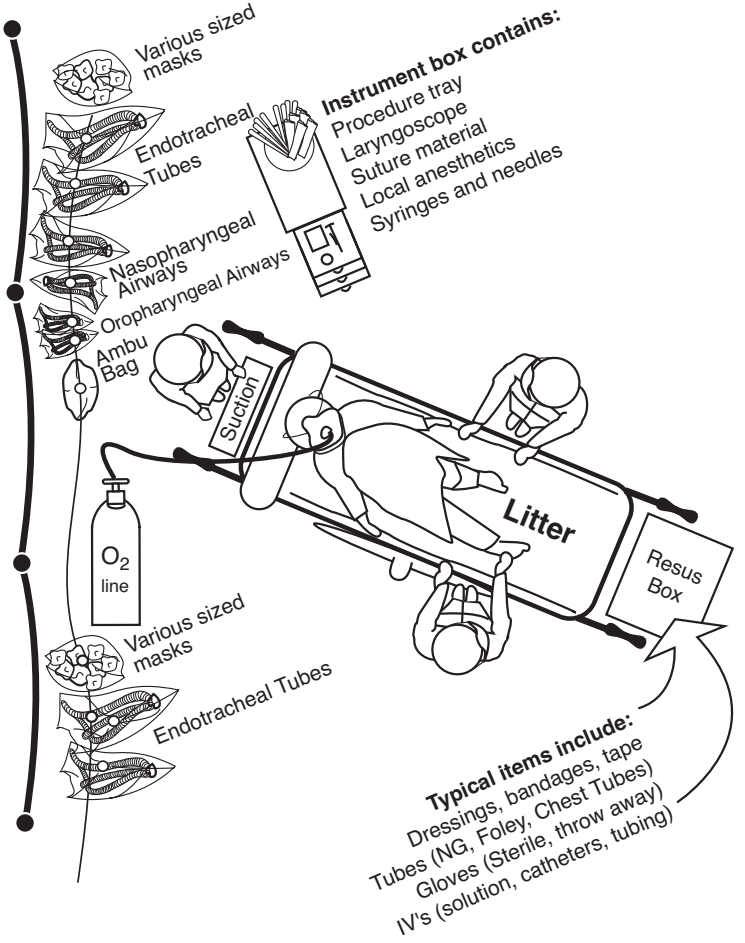



**Fig. 3-1b.** Resuscitation Station.

- ♦ Resuscitation team. A physician, nurse, and medical technician, ideally.
  - ◊ Each individual treatment team will coordinate movement of its patient via the team leader.

o Operation.

- ♦ Manpower team delivers patient.

- ♦ Team Leader retriages patient and assigns resuscitation team to patient.
- ♦ Resuscitation team treats patient and determines required disposition (surgery, ICU, ward, air evacuation).
- ♦ Resuscitation team communicates to Team Leader the recommended disposition.
- ♦ Team Leader coordinates movement of patient to next stop.
- ♦ Administrative person records disposition.

- Nonemergent treatment area.
  An empty ward, a cleared out supply area, or other similar space can be utilized. Appropriate medical and surgical supplies should be stockpiled and easily identifiable. A team consisting of a physician and several nurses and medical technicians can form the nucleus of the treatment team. Lacerations can be sutured, closed fractures splinted, IVs placed, and radiographs taken. The team leader should be alert to changing vital signs, mental status changes, and any failure to respond to appropriate treatment measures. Any evidence of deterioration should prompt a retriage decision and a possible transfer to the emergent treatment area.
- Expectant area.
  Ideally, expectant casualties should be kept in an area away from all other treatment areas. The team leader can be anyone capable of giving parenteral pain medications. The patient should be kept comfortable. **After all other patients have been treated, a retriage of these patients should be done and treatment instituted if appropriate.**

**Additional Triage Operation Tips**

- Diversion of casualties to another facility should be considered. These options (sister service, local national assistance, or local NATO assets) should be established prior to the mass casualty event.
- As the casualties finally clear the OR suites, the pace will slow for the surgeons. ICU and ward care will supplant operative procedures. Casualties initially undertriaged (~10%) will be discovered and will require care. The recovery room and ICUs will become crowded, nursing

shifts will have to be extended, and fatigue will rapidly become a hospital-wide factor.

- Numerous authors have stated that after the first 24 hours of a mass casualty ordeal, the activities of the care providers must be decreased by 50%, allowing for recovery and rest for the participants, and a new rotation must be established to sustain a modified but continuous effort. Once the press is over, personnel must be encouraged to rest rather than to socialize. Rest must be enforced because the entire scenario may recur at any time.
- Prior to an actual mass casualty situation, all deployable units should exercise a variety of triage scenarios to ensure smooth patient flow and identification. "Driving" litters without running into things can be difficult unless practiced! These scenarios should evaluate personnel, supplies, and equipment.

**Conclusion**

Small, highly mobile units, either Special Operations or conventional forces, are currently performing military operations around the globe. These units are usually supported by highly mobile, small footprint surgical elements that have limited diagnostic, operative, holding, and resupply capability. Evacuation may entail an extremely long transport from point of wounding to the forward surgery team, then another long transport directly to a Level IV/V. Air superiority may be in question, especially the use of helicopters for initial patient evacuation. In these situations the tactical, logistic, and physiologic integration of triage concepts becomes of paramount importance and needs to be considered and extensively discussed prior to arrival of the first casualty.