

The humble stretcher



Fig. XLVII. *By Maitre du Couronnement de Charles VI. Source: Gallica Digital Library*
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early 1900s, fuelled the greatest advances in casualty care and a consequential rapid evolution of stretcher design. Ammunition, soldiers and the wounded were all moved at the same time during World War I. Ammunition and soldiers both come before the wounded. Colt's stretcher for trenches was used to move a casualty from the initial location. The shape is designed to prevent attack from the sides and the spread of shrapnel from exploding bombs. But every corner is an obstacle around which you have to manoeuvre the rigid wooden stretcher. Survival of the injured depends on getting him to medical care as quickly as possible. A flexible stretcher like Colt will be easier to use. Trench corners will be easier to navigate and you and the other bearer will be able to move more freely and quickly. So you might find you have extra work on your hands, with time to go back to the battlefield and collect more casualties.

An early stretcher, likely made of wicker over a frame, appears in a manuscript from circa 1380. Simple stretchers were common with militaries right through the middle of the 20th Century.

A stretcher, cot, litter or pram is an apparatus used for moving patients who require medical care. A basic type cot must be carried by two or more people. A wheeled stretcher known as a gurney, is often equipped with variable height frames, wheels, tracks or skids. The name gurney comes from a horse-drawn cab patented in the USA by J Gurney in 1883. Stretchers are primarily used in acute out-of-hospital care situations by emergency medical services, military and search and rescue personnel. In medical forensics, the right arm of a corpse is left hanging off the stretcher to let paramedics know it is not a wounded patient.

Warfare from the 1850s onwards, leading to the inevitable human casualties, coupled with a most significant increase in work-related accidents in the late 1800s and

The earliest stretchers used in ambulances were the Army cot-type canvas and wooden stretchers. As ambulances moved from horse drawn to motorised, wheeled stretchers began to evolve.



Colt's stretcher for trenches, 1915-1918
Source: sciencemuseum.org.uk

Early stretchers required a great deal of maintenance. Companies selling the stretchers either trained department personnel to do maintenance and repair on the stretchers or provided a contract service. Failure of stretcher components was so common that aggressive care was a must.

Over the last decade, there have been big changes in the stretchers available for use in ambulances. Carbon-based polymers have provided strength while reducing weight. Stability when moving over uneven surfaces has been enhanced by larger, specially-designed wheels. The mechanisms that allow you to raise and lower the stretcher or the head or foot of it have been redesigned for ease of use, stability and safety and durability.

Portable stretchers evolved from wood and heavy canvas to lightweight aluminium and canvas. They also stored easily, folding to fit into smaller compartments.

Basket stretchers have also improved over the years. Originally made of wire and steel, they evolved into lightweight, strong, easy-to-clean plastic.



Litter on wheels, made circa 1900

Stokes stretcher

The Stokes stretcher, also known as the wire basket stretcher, is arguably one of the oldest medical devices in continuous use by the military. First exhibited at the St Louis World's Fair in 1904, it was conceived by the US Navy physician Charles Stokes (1863-1931) who in the Spanish-American War, witnessed first-hand the difficulties of transporting wounded through a Navy ship's gauntlet of gangways, ladders and hatches.

Unlike 'ambulance cots' and 'transferring boards' that were commonly used by the Navy at the end of the 19th Century, the Stokes was both stretcher and splint in one. It could immobilise the injured parts, allow for the carrying of a patient with minimum direct handling of extremities and according to its inventor, offer some "comfort and a sense of security."

In January 1906, by order of President Theodore Roosevelt, a joint board of Army and Navy medical officers convened to look at "improving the [military] medical departments." Along with the proposal for standardised diagnostic tags and the use of a Hospital Corps pouch (forerunner of the unit bag), the medical officers called for adoption of the Stokes Stretcher by the Army and Navy for use aboard hospital ships, transports and at seacoast artillery stations.

Charles Stokes would go on to serve as the first medical officer to command a Navy hospital ship (USS Relief) sailing it around the globe with Roosevelt's 'Great White Fleet' in 1908. In 1910, Stokes was appointed the Navy's 14th surgeon general, holding the office until 1914. He retired from the Navy as a rear admiral in 1917.



Battle of Pilckem Ridge 31 July to 2 August 1917: stretcher bearers struggle in mud up to their knees to carry a wounded man to safety near Boesinghe West Flanders, Belgium on 1 August 1917



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► **Gurney**

Generally spelled gurney but also guerney or girney. The first usage of the term for a wheeled stretcher is unclear but it is believed to have been derived from Pacific Coast slang. Its use in a hospital context was established by the 1930s. For ambulances, a collapsible wheeled stretcher or gurney, is a type of stretcher on a variable-height wheeled frame. Normally, an integral lug on the stretcher locks into a sprung latch within the ambulance in order to prevent movement during transport, often referred to as antlers due to their

shape. It is usually covered with a disposable sheet and cleaned after each patient in order to prevent the spread of infection. Its key value is to facilitate moving the patient and sheet onto a fixed bed or table on arrival at the emergency department. Both types may have straps to secure the patient.

The Nimier stretcher (brancard Nimier) was a type of stretcher used by the French army during World War I. The casualty was placed on their back but in a 'seated position', that is, the thighs were perpendicular to the abdomen. Thus, the stretcher

was shorter and could turn in the trenches. This type of stretcher is rarely seen today.

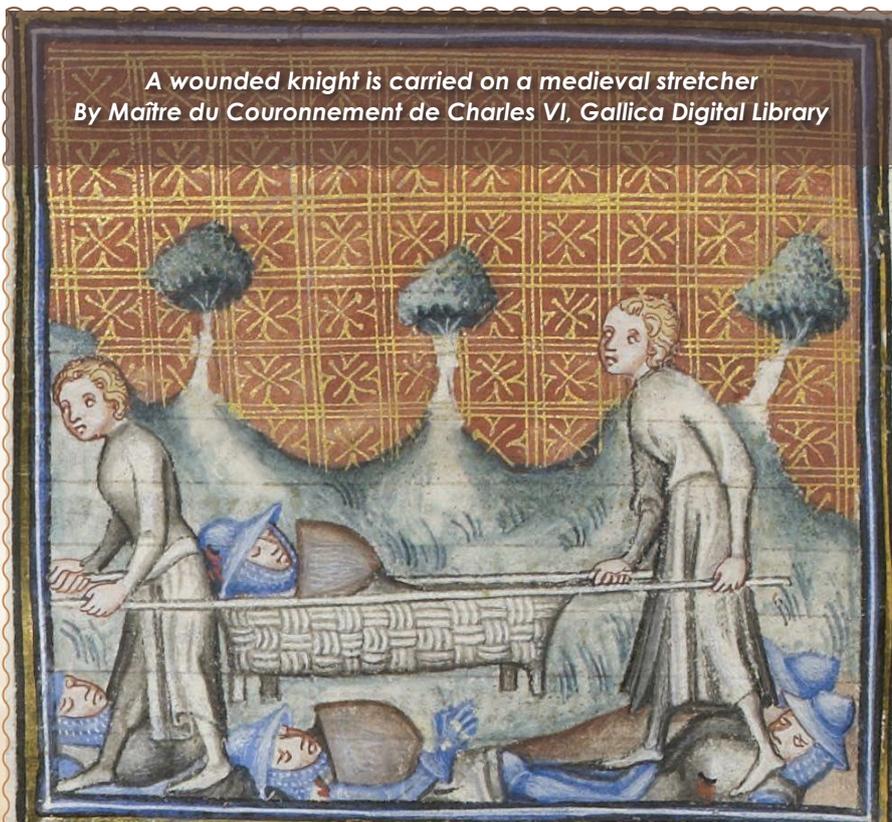
EMS stretchers used in ambulances have wheels that make transportation over pavement easier and have a lock inside the ambulance and straps to secure the patient during transport. An integral lug on the stretcher locks into a sprung latch within the ambulance in order to prevent movement during transport. Modern stretchers may also have battery-powered hydraulics to raise and collapse the legs automatically. This eases the workload on EMS personnel, who are statistically at high risk of back injury from repetitive raising and lowering of patients. Specialised bariatric stretchers are also available, which feature a wider frame and higher weight capacity for heavier patients. Stretchers are usually covered with a disposable sheet or wrapping and are cleaned after each use to prevent the spread of infection. Shelves, hooks and poles for medical equipment and intravenous medication are also frequently included.

Basic stretchers

Simple stretchers are the most rudimentary type. They are lightweight and portable, made of canvas or other synthetic material suspended between two poles or tubular aluminium frame. Many are stored as disaster supplies and are often former military equipment.

The folding stretcher, also known as a top deck or collapsible stretcher, is similar in design to the simple stretcher but features one or more hinged points of articulation to allow the stretcher to be collapsed into a more compact form for easier handling or storage. Some models may even allow the patient to sit upright in a Fowler's or Semi-Fowler's position.

The scoop stretcher is used for lifting patients, for instance from the ground onto an ambulance stretcher or onto a spinal board. The two ends of the stretcher can be detached from each other, splitting the stretcher into two longitudinal halves. To load a patient, one or both ends of the stretcher



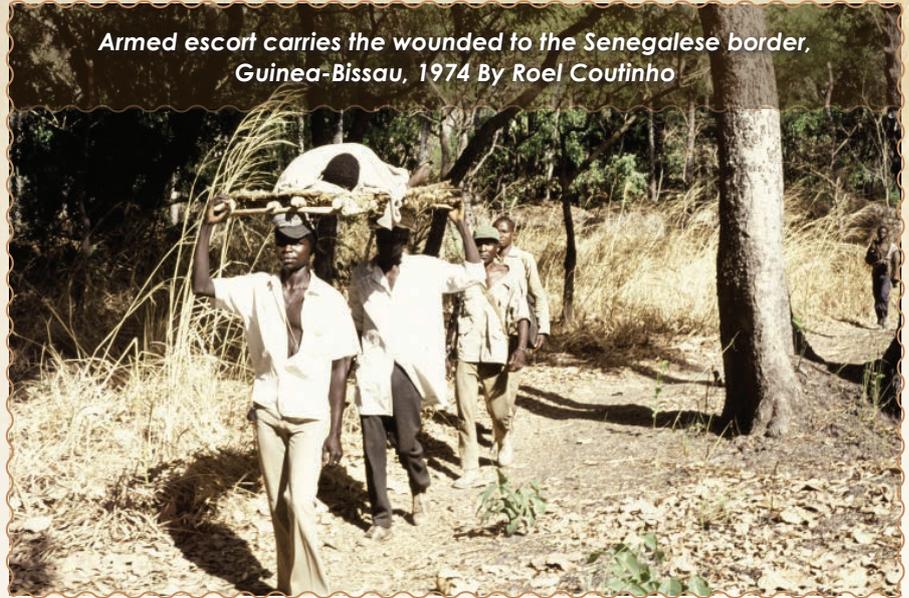
*A wounded knight is carried on a medieval stretcher
By Maître du Couronnement de Charles VI, Gallica Digital Library*



are detached, the halves placed under the patient from either side and fastened back together. With obese patients, the possibility exists of accidentally pinching the patient's back when closing the stretcher, so care must be made not to injure them when carrying out this procedure.

The litter, also known as a rescue basket or Stokes basket, is designed to be used where there are obstacles to movement or other hazards; for example, in confined spaces, on slopes, in wooded terrain. Typically it is shaped to accommodate an adult in a face up position and it is used in search and rescue operations. The person is strapped into the basket, making safe evacuation possible. The litter has raised sides and often includes a removable head/torso cover for patient protection. After the person is secured in the litter, the litter may be wheeled, carried by hand, mounted on an all-terrain vehicle (ATV), towed behind skis, snowmobile or horse, lifted or lowered on high angle ropes or hoisted by helicopter.

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Armed escort carries the wounded to the Senegalese border, Guinea-Bissau, 1974 By Roel Coufinho

search and rescue operations. The person is strapped into the basket, making safe evacuation possible. The person generally is further protected by a cervical collar and sometimes a long spine board, so as to immobilise the person and prevent further injury. They are most notably remembered from Korea and Vietnam images of United States Air Force Pararescue airmen or more recent US Coast Guard video clips of helicopters rescuing injured people from isolated areas.

A Reeves Sleeve, SKED or 'flexible stretcher' is a flexible stretcher that is often supported longitudinally

by wooden or plastic planks. It is a kind of tarpaulin with handles. It is primarily used to move a patient through confined spaces, eg a narrow hallway or to lift obese patients. Reeves stretchers have six handholds, allowing multiple rescuers to assist extrication.

The WauK board is also designed for use in small spaces. The patient is secured to the board with straps. It has two wheels and a foldable footrest at one end, allowing the patient to be moved by one person, much as with a hand truck for moving cargo. It can also be used at a variety of angles, making it easier to traverse obstacles, such as tight stairwells.

Standard stretchers have several adjustments. The bed can be raised or lowered to facilitate patient transfer. The head of the stretcher can be raised so that the patient is in a sitting position (especially important for those in respiratory distress) or lowered flat in order to perform CPR or for patients with suspected spinal injury who must be transported on a spinal board. The feet can be raised to what is called the Trendelenburg position, indicated for patients in shock.

Some manufacturers have begun to offer hybrid devices that combine the functionality of a stretcher, a recliner chair and a treatment or procedural table into one device. ▲



US Marines transport a non-ambulatory patient via litter, outside of Fallujah, Iraq in 2006