

tral response is available at the same time as initial response is required by emergency services.

Discussion: By developing such an organization, the benefits of providing early integrated response by medical coordinators ensures on-site medical control is established at the same time as first response occurs, proper liaison is affected with combat commanders, and that a correct assessment is made of the situation. In addition, the problem of inappropriate convergence of medical assistance is minimized, casualties can be distributed to appropriate hospitals more easily, resources can be arranged more easily, and preplanned site procedures can be adhered to by paramedics, hospital medical teams, mental health, and other responders required during the incident. The major factor emanating from providing such an organization is that when disaster strikes, the total medical and health response, which is not a discreet service, is able to work comfortably with other emergency services, because on a daily basis the medical coordinators are members of all relevant planning committees, work together during lesser incidents, and get to know personalities of other services.

084. Physicians Guide for Extremity Trauma

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At the Miguel Couto Trauma Center in Rio de Janeiro, Brazil, the trauma team has four orthopedic surgeons and three residents on duty each 24 hours under Professor Nova Monteiro's leadership. Sometimes, all of them are at the operating theater, and other physicians need to take the initial care of extremity trauma. The hospital has 800 admittances at the emergency room per day, and 50% are not in need of emergency orthopedics (28% of these patients each day).

Concerning this, we prepared a training guide including how to recognize the severity of one extremity trauma either closed or open fracture and the initial management of these lesions by non-orthopedic surgeons.

The extremity trauma care is done after the ABCs.

The rule 1 is LOOK, FEEL, and MOVE.

The rule 2 is CLEAN and PROTECT the wounds.

The rule 3 is PREVENT further injury.

The rule 4 is how to IMMOBILIZE.

The rule 5 is MEDICATION and X-RAY examinations.

The authors will distribute this practical guide during the Congress. It has worked very well in Rio, reducing dramatically (70%) of the complications of some extremity injuries when they initially are managed by other physicians at the hospital. This guide also is now in use for the paramedics, working in prehospital care.

035. Fluid Therapy with Middlemolecular Hydroxyethyl Starch (HES 200/0,5) in Surgery, Trauma, Sepsis, and Burns

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HAES-steril® is a colloidal plasma volume substitute and, therefore, increases the plasma volume, thus improving cardiac output and oxygen transport values. As a result, HAES-steril® is capable of improving organ functions and the overall hemodynamic situation in patients with hypovolemia/shock.

HAES-steril® 6% is used for medium-term, non-expansive, volume replacement therapy in routine surgical patients. Since the hemodynamic efficacy of HAES-steril® 6% is similar to that of 5% human albumin of Plasma Protein Fraction, the use of HAES-steril® in hypovolemic/shock patients substantially cuts down the albumin and PPF consumption.

HAES-steril® 10% is used for medium-term expansive volume replacement therapy in the above patient population with hypovolemia and shock if the overriding therapeutic goal is to achieve a more rapid and more extensive expansion of the plasma volume and a more profound improvement in hemodynamic variables, microcirculatory flow, and oxygen delivery. Examples include ICU patients with massive acute blood losses, surgical patients with protracted shock and disturbed microcirculation and/or those at high risk for developing pulmonary thromboembolism (PTE). HAES-steril® 10%, too, saves considerable amounts of albumin in the treatment of hypovolemic/shock patients.

Nearly all clinical trials of HAES-steril® showed significant improvements in arterial pressures (MAP, PAP), cardiac index (CI), oxygen delivery (DO₂), and oxygen consumption (VO₂), as well as in organ functions.

Thus, HAES-steril® 10% and HAES-steril® 6% meet Shoemaker's criteria (cf. section on Hypovolemia/Shock) of reducing the morbidity and mortality of critically ill patients.

The efficacy of HAES-steril® 10% and HAES-steril® 6% proved similar and/or superior to the efficacy of 5% albumin.

The effects of HAES-steril® 10% and HAES-steril® 6% proved superior to the effects of crystalloid solutions. Crystalloid solutions, even when given in a multiple overdose, are not suitable for improving hemodynamics and oxygen transport in patients with hypovolemia and shock.

021. Management of Extremity Injuries in Extreme Circumstances

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External fixation is in its present renaissance due to the rapidly rising frequency of severe road accidents, civilian and military mass casualties, local wars, and terrorist attacks. The goal for

management of extremity injuries in such conditions is to achieve the rapid transportability of the casualties.

Our new methodology is based upon the combined use of a disposable and a sophisticated fixation device applied to the commonly used pin system. For initial management, the cheap, single-use device is applied, and after transportation, it can be changed for the better developed devices. The use of our single-use fixators demonstrated that they functioned with favourable results even when used in peacetime surgery and that they are cost effective. None of the presently existing so-called war-fixator systems meet the requirements for the budgetary and logistic aspects of the management of mass casualties. In the third world and in underdeveloped countries, there are no funds either in war or in peacetime to treat such terrible situations in professionally correct way. The costs of surgical management are sometimes so high that they cause socio-economic dilemmas even in developed countries. The Manuflex system was developed by the author's own invention and seems to help answer this difficult question.

043. Hospital Trauma Surgery in Mass Casualty Situations: A New Approach

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Disaster planning relates mainly to the organizational aspects of medical care required in mass casualty situations. The principles of patient care once the casualties have reached the hospital are not well-defined. It is implied that the in-hospital surgical management of individual patients in a disaster scenario is based on accepted standards of care defined for civilian trauma.

Our team developed precise clinical guidelines for the surgical care of the wounded in a mass casualty situation. This is based on adaptation of principles of military field surgery to the civilian hospital set-up. During the actual intake of casualties, the prime consideration is the correct distribution and conservation of critical hospital resources by providing minimal acceptable care (rather than optimal care) to the maximal number of salvageable patients. The second (definitive) phase takes place when casualties no longer are arriving at the hospital. Then, optimal care is provided to all patients in a priority-oriented graded fashion.

Guidelines for minimal acceptable care include immediate surgery only for patients who are hemodynamically unstable following truncal injuries, and for patients who neurologically unstable following head injuries that are salvageable. Penetrating abdominal trauma in stable patients are treated non-operatively, and chest trauma is managed by empirical tube thoracostomy without a chest X-ray. Suspected extremity fractures are immobilized without X-ray. Agonal patients are not resuscitated. The great majority of patients are admitted temporarily to the hospital wards without imaging or laboratory studies, and await further work-up and surgery during the second phase.

This new strategy provides a practical framework for the

optimal utilization of limited hospital resources in disaster situations.

011. Bellows or Bag? A Test of 10 Ventilators

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Objective: Ventilation in CPR usually is started with bag-valve-mask. The American Heart Association recommendations (0.8–1.2 liters in 1.5–2 seconds) are difficult to fulfill.^{1,2,3} Do bellows ventilators have advantages in this circumstance?^{4,5}

Materials: One ventilation bag (Ambu Mark 3: AM); 6 ventilation balls (Ambu Silicon: AS; Laerdal: LA; Drager 2000: D2; Hope: HO; Mercury: ME; Weinmann: WE), and 3 bellows ventilators (Kendall Cardiovent: KE; Drager Resusitator 63: DR; Tagg Breathsaver: BR).

Methods: Twelve paramedics performed mask ventilation on a Laerdal Recording Anne lying on the floor (FATS-technique^{2,3}) and in a bed, trying to achieve 0.8–1.2 liter tidal volume. The graphical strips were analyzed. The probands judged the performance on a 6-point scale (1 = very good, 6 = insufficient).

Results:

	Tidal volume (liters)			Max. TV Performance	
	Percent Achieving			(Liter)	(Mean)
	<0.5	0.5–0.75	0.8–1.2	>1.2	
AM	1	25	72	2	1.3
AS	1	8	71	20	1.4
LA	0	16	67	17	1.5
D2	2	17	68	13	1.5
HO	1	21	68	10	1.45
ME	2	19	60	19	1.5
WE	20	43	37	0	1.1
KE	0	12	87	1	1.25
DR	2	22	76	0	1.15
BR	7	32	61	0	1.15

Conclusions: The bellows of Kendall (prototype) and Drager (historical) allowed an exact ventilation comparable to the best conventional ventilator (Ambu Mark 3). The balls (except Weinmann) showed a tendency to high volumes (danger of gastric inflation). Ambu Mark 3 and Kendall Cardiovent were judged best in performance.

References

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