

upper arm, pulmonary edema, hypothermia.

**Treatment:** Furosemide, nitroglycerin, positive end-expiratory pressure (PEEP) ventilation, surgical treatment of the stump, antibiotics.

**Outcome:** PEEP ventilation until the following morning. Thereafter, successful extubation. Discharge to the peripheral ward one day later. Hospital discharge after an uncomplicated course, 8 days later.

**Conclusions:** Even in young, previously healthy trauma patients, volume therapy has to be considered carefully. Massive fluid loading can cause severe pulmonary edema when blood loss is overestimated and the consequences of hypothermia are ignored.

**Key Words:** fluid resuscitation; hypothermia; pulmonary edema; trauma

### The Role of Abdominal Pansonography in Penetrating War Injuries of the Thorax

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**Objective:** The authors emphasize the role of abdominal pansonography in patients with penetrating injuries of the thorax with an intact abdominal wall, due to battle in Croatia.

**Methods:** From August 1991 to August 1995, 88 wounded patients with penetrated injuries of the thorax were sonographically examined. The pansonography of the abdomen was performed in 71 of the wounded within 1 hour after admittance to the Intensive Care Unit, in seven patients within first 24 hours, and in 10 of the injured inside of 72 hours (after urgent thoracotomy).

**Results:** From 88 patients wounded with trauma of the thorax, 37 (42%) had combined thoraco-abdominal injuries. Rupture of the diaphragm was sonographically present in 18 (49%) while in 19 (51%), it was intact, which was confirmed intraoperatively. Pansonography of the abdomen showed both ruptures of the liver and spleen or spleen and tail of the pancreas in nine of the victims (24%) or solitary ruptures of spleen and liver in 13 (35%). In 3 (8%) patients were found only a free fluid in abdomen (intraoperative: mesentery and small intestine rupture).

**Conclusions:** Projectiles with high initial speed caused large tissue lesions far from the missile path. Vibration from the bullet in injuries of the thorax resulted in combined thoraco-abdominal wounds. Presented results confirmed the value of sonographic diagnosis in transmitted trauma of the abdomen and point up its necessity in diagnosis and follow-up of those patients.

**Key Words:** abdominal injuries; bullets; missiles; sonography; thoracic injuries; thoraco-abdominal injuries; war; wounded

### The Importance of Research Left Ventricular Function After Acute Severe Trauma

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**Introduction:** Hypotension, defined as a systolic blood pressure (SBP) lower than 80 mmHg is present in 50% in the early phase of acute, severe trauma (AST). Such an impairment in left ventricular (LV) function has been observed with hypovolemic shock in patients with AST. Therefore, studying LV function after AST seems obvious.

**Patients and Methods:** Twenty patients admitted to our ICU were studied within the first 3 hours (h) and 24–48 h of the post-traumatic period. Invasive hemodynamic data were obtained from arterial and Swan-Ganz catheters. Cardiac output (CO) was measured by the thermodilution technique. The other parameters (CI, SVR, DO<sub>2</sub>, VO<sub>2</sub>) were calculated using the standard formulas.

**Results and Discussion:** After the first 3 h after trauma patients showed high HR (124 ± 18 bpm) and lower SAP (95 ± 8.7 mmHg), CI (2.3 ± 0.5 l/min./m<sup>2</sup>), SI (37 ± 4.1 ml/m<sup>2</sup>), whereas SVR was elevated. At day 1 and day 2, SBP and CI increased significantly (33.0 ± 4.1% and 42 ± 3.2% corresponding), whereas SVR and HR decreased, and VO<sub>2</sub> and DO<sub>2</sub> remained essentially unchanged. Therefore, the hypotension observed at the early phase of AST usually is considered to be secondary to hypovolemia, with decreases the venous return and resulting decrease in SAP despite increased SVR. SAP increased during the first hours after trauma and on day 2, suggesting an increased afterload and compensation hypovolemia. Despite a normal or increased CO, ventricular function was impaired, suggested by the low LV ejection fraction. Such myocardial depression could result from myocardial ischemia caused by reduced coronary blood flow and myocardial DO<sub>2</sub>.

**Conclusion:** Following AST, an early alteration of cardiac performance was observed with a decrease LV function. Therefore, measurement of central hemodynamics should play an important role in evaluation of preload and cardiac function for emergent treatment after AST.

**Key Words:** acute severe trauma, left ventricular function

### Tactics and Strategy of Confronting Disaster for Jordan Civil Defense

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It is known that any type of disaster consists of three main stages. They are: I) pre-occurrence or initial insult; II) the occurrence including the three sub-stages; and III) post aftermath or final. In these stages, the recovery, handling, and dealing with different kinds of incident is the responsibility mainly of Civil Defense. This is the only governmental organization that deals with such events.

#### Stage I

In order to cope with and to mitigate the effect of any disaster, Civil Defense is concerned mainly with Stage I, which is the most important and vital phase to control the disaster: 1) The hazard zone must be defined and specify how it is in accordance with the emergency and mitigation plan; 2) train people; 3) be aware; and 4) per-