

**Results:** Almost all of the reports discussed the importance of the prehospital emergency care system. However, many suggest that only a fraction of the patients who are treated arrive via ambulance, particularly during the early post-incident stages of a disaster.

**Conclusions:** Hospitals should develop emergency plans that consider alternative referral patterns of patients during a disaster. Hospital staff should be proficient in triage, decontamination, and safety and security procedures should they encounter a patient surge on their facility.

**Keywords:** ambulance; disaster; emergency health; emergency

medical services; transportation

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### Antioxidant Effect of N-acetylcysteine in Liver Ischemia-Reperfusion Injury following Hemorrhagic Shock

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**Introduction:** Hemorrhagic shock (HS) is the main cause of early death in trauma and the reperfusion injury, secondary to large volume saline treatment, has been identified as an important factor leading to multiple organ dysfunction syndrome. N-acetylcysteine (NAC) is an antioxidant able to modulate the inflammatory response after ischemia-reperfusion harm. The aim of this study was to evaluate NAC effects on the liver during resuscitation of HS. **Methods:** Adult Wistar rats were used in two test groups and one control group was used. In the HS group (HSG), the rats underwent HS (mean arterial pressure of 35 mmHg) followed by resuscitation with Ringer's lactate solution and blood (n = 10). The same procedure was used for the second group (HNG) plus two doses of NAC 150 mg/kg, one during and another 30 min after resuscitation (n = 10). Both groups were compared to a control group (CG) (n = 6). Differences among the groups were analyzed by one-way ANOVA, followed by post-hoc tests.

**Results:** The addition of NAC did not affect arterial blood pressure. Hepatocyte necrosis was lower in the CG (4.8 ± 0.6%), intermediate in the HNG (9.7 ± 0.9%), and more frequent in the HSG (16.4 ± 0.8%; *p* < 0.001). Aspartate aminotransferase (AST) and alanine aminotransferase (ALT) levels were similar between the CG (255 ± 17 U/L and 56 ± 7 U/L, respectively) and the HNG (209 ± 19 U/L and 111 ± 13 U/L, respectively), but higher in the HSG (792 ± 102 U/L and 525 ± 89 U/L, respectively; *p* < 0.001 for both parameters). Thiobarbituric acid reactive substance concentrations were similar between the CG (70.3 ± 4.2 mol/g) and the HNG (66.8 ± 5.1 mol/g), but higher in the HSG (85.6 ± 3.3 mol/g; *p* = 0.016). Oxidized glutathione levels were different only between the CG (0.23 ± 0.12 g/g) and the HSG (0.06 ± 0.01 g/g; *p* = 0.025).

**Conclusions:** These data suggest that NAC could prevent liver cellular damage following hemorrhagic shock proba-

bly due to its antioxidative effect, even without modifying the arterial blood pressure.

**Keywords:** hemorrhagic shock; liver; N-acetylcysteine; reperfusion injury; trauma

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### Analysis of the Clinical and Laboratory Features of Young Adults with Uncomplicated Dengue Hemorrhagic Fever at Philippine General Hospital—Is Hospitalization Needed?

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**Introduction:** Dengue is the most common and widespread arthropod-borne arboviral infection in the world today. Some 2.5–3 billion people live in areas where dengue viruses can be transmitted. It is estimated that each year, 50 million infections occur, with 500,000 cases of dengue hemorrhagic fever (DHF) and at least 12,000 deaths. In the Philippines, the Field Health Services Information System (FHSIS) reported that in 2007, dengue was one of the top 10 leading cause of morbidity with a total of 37,583 cases reported and 290 deaths mainly affecting children <15 years of age.

**Methods:** The medical records of the patients who were admitted to the University of the Philippines, General Hospital (UP-PGH) Emergency Department-Acute Care Unit (ED-ACU) from May to October 2008 who had a discharge diagnosis of dengue hemorrhagic fever were retrospectively reviewed. Data was analyzed using chi square and odds ratio with alpha of 0.05. The World Health Organization criteria will be used to reclassify all cases into dengue fever and dengue hemorrhagic fever.

**Results:** There were 36 patients with a mean age of 22 years; 81% were male. Among all cases, fever occurred in 100%; positive tourniquet test in 72%; petechia in 75%; myalgia 74%; leukopenia 100%; and thrombocytopenia 100%. After admission, fever lasted a mean of one day (range = 0–4 days). Hypotension occurred in 5% and no bleeding was reported. The mean time of platelet increase from platelet nadir to more than 50,000/uL was one day (0–4 days). No patients suffered epistaxis, gum bleeding, or gastrointestinal bleeding. The mean length of hospital stay was three days (3–5 days).

**Conclusions:** For young adults with uncomplicated dengue infections, morbidity was low and hospitalization may be unnecessary. Daily outpatient monitoring either at private clinics, private or public hospitals, with symptomatic treatment and medical leave, may be a safe and feasible alternative.

**Keywords:** dengue hemorrhagic fever; hospitalization; morbidity; patient; Philippines

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### Strong Ion Gap is Better than Serum Lactate or Anion Gap at Predicting Intensive Care Unit Admission, In-Hospital Mortality, or Need for Transfusion or Vasopressor Support

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**Introduction:** Unmeasured plasma anions are important biomarkers for life-threatening conditions. Anion-Gap (AG) calculations are confounded by changes in pH, pCO<sub>2</sub> and other