

ATB and JHC were members of the International League Against Epilepsy (ILAE) Commission on Classification and Terminology 2005-2009 and were two of the authors of the ILAE report discussed in the commentary.

- 1 Gastaut H. Clinical and electroencephalographical classification of epileptic seizures. *Epilepsia* 1970; **11**: 102-13.
- 2 Merlis JK. Proposal for an international classification of the epilepsies. *Epilepsia* 1970; **11**: 114-19.
- 3 Commission on Classification and Terminology of the International League Against Epilepsy. Proposal for revised clinical and electrographic classification of epileptic seizures. *Epilepsia* 1981; **22**: 489-501.
- 4 Commission on Classification and Terminology of the International League Against Epilepsy. Proposal for revised classification of epilepsies and epileptic syndromes. *Epilepsia* 1989; **30**: 389-99.
- 5 Berg AT, Berkovic SF, Brodie MJ, et al. Revised terminology and concepts for organization of seizures and epilepsies: Report of the ILAE Commission on Classification and Terminology, 2005-2009. *Epilepsia* 2010; published online Feb 26. DOI:10.1111/j.1528-1167.2010.02522.x.

Disaster relief in Haiti: a perspective from the neurologists on the USNS COMFORT

On Jan 12, 2010, a 7.0 Richter earthquake in Haiti led to a worldwide humanitarian effort, the largest in the US Navy's history. Over 200 000 people died and countless more were injured and homeless. Within 8 days of the earthquake, the USNS COMFORT docked 2 miles off the coast of Haiti and served as the tertiary medical centre for the region. The range of the neurological cases seen aboard the COMFORT highlights the importance of neurology professionals in mass casualty response.

Aboard the COMFORT were a neurologist (a native speaker of Haitian-Creole) and two neurosurgeons from the US Navy, a paediatric neurologist from the US Agency for International Development (USAID), three physical therapists (two from the US Navy and a Project Hope volunteer who is a native speaker of Haitian-Creole), and five physical therapy assistants. Another paediatric neurologist at a nearby US Air Force facility at Terminal Varreux was available for consultation. Imaging capability on board included roentgenography, CT, and ultrasound. However, shortly after our arrival, an earthquake aftershock disrupted the CT scanner rendering it unusable, which led to increased use of skull roentgenograms and ultrasound for diagnostic purposes during the first 3-5 days. The on-board laboratory could do haematology, blood chemistry, CSF, microbiological, serum anticonvulsant, and rapid malaria and HIV tests. Essential laboratory assessments that could not be completed in the onboard laboratory were sent to the USA. Electroencephalography (EEG), nerve conduction studies, and electromyography were not available because on previous COMFORT missions there was not a great need for these.

Physicians from the COMFORT served as triage officers on land and worked with non-governmental

organisations (NGOs) and the Haitian Ministry of Public Health and Population to identify patients requiring admission. Triage officers adhered to the principle of justice, with an emphasis on admitting patients with earthquake-related injuries. We believe that our management of resource-intensive patients enabled other facilities to assist a larger number of less severely injured patients. Some patients were transferred to the COMFORT from the USS Carl Vinson, USS Bataan, and other ships that arrived in Haiti before the COMFORT.

Most patients we saw were remarkably stoic, although reactions varied considerably among patients. For example, a 27-year-old Haitian woman was crushed by her house resulting in an L1 fracture with paraparesis and the death of her entire family. Despite this life-changing event, she did not express sadness to the neurologists.

For more on the US Navy's humanitarian aid see http://baltimoretimes-online.com/index.php?option=com_content&task=view&id=1068&Itemid=31

For more on Project Hope see <http://www.projecthope.org/>

For more on historic world earthquakes see http://earthquake.usgs.gov/earthquakes/world/historical_country.php

For more on the Haitian earthquake see <http://news.smh.com.au/breaking-news-world/haiti-quake-death-toll-reaches-212000-20100205-nhyv.html>



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Many patients like her would state the common Haitian proverb: "Beyond the mountains there are more mountains." This quote refers to the many challenges Haiti has had to overcome throughout its history and the Haitian people's anticipation of further challenges to come. She remained hopeful for the future.

Of over 862 patients admitted in 7 weeks, 773 were Haitian nationals. About 130 patients, one third of whom were paediatric patients, were seen by neurologists. 63 neurosurgical surgeries (19 cranial and 44 spine) were done. Often patients had fractures or wounds in addition to their presenting condition. The most common reason neurologists were consulted was weakness including monoparesis, paraparesis, and tetraparesis, which were often associated with a fracture or displacement of the vertebral column. All patients were offered physical therapy, whether or not they required surgery. An overwhelming number of patients were recovering from neurotrauma, fractures of extremities, amputations, and other injuries, and physical therapists had difficulty meeting the high demand for their services. Many patients had traumatic brain injuries, including a few infants who had cranial fractures with resultant brain fungating upward through the skull. Many patients presented with non-surgical basilar skull fractures complicated by CSF leakage, which resulted in meningoencephalitis in some patients. Some patients had traumatic cranial neuropathies (mostly abducens).

Other earthquake-related trauma included trauma to peripheral nerves and brachial and lumbosacral plexus, which were typically secondary to long bone fractures or other fractures that had already been addressed surgically. Several patients with crush injuries and acute renal failure received haemodialysis, mostly with good outcomes. Some patients with trauma had chronic neurological conditions including epilepsy, neurofibromatosis, and stroke. We saw patients with both communicating and non-communicating hydrocephalus. Some patients presented with intracranial tumours and CT scans revealed chronic tumour-related changes. One child was admitted to an onshore facility with sickle cell disease presenting as a left hemispheric stroke and status epilepticus. We gave her anticonvulsants, obtained a haematology consultation, and arranged monthly blood transfusions through an onshore NGO.

Earthquakes can lead to soil-contaminated wounds and tetanus in under-immunised populations. At first, only patients with the most severe wounds were given tetanus toxoid. Later in the mission, when supplies were replenished, all patients with wounds were given human tetanus immune globulin in addition to tetanus toxoid. We managed six patients with tetanus, five of whom required assisted ventilation. One patient was transferred to a hospital in the USA for higher level care. We saw one patient with cerebral malaria, confirmed by gametocytes in the peripheral blood smear; this patient died. A US volunteer from a land-based NGO had presumed dengue fever; he made a full recovery before discharge. Two paediatric patients with infectious encephalitis had non-convulsive status epilepticus; both patients showed improvement in mental status after administration of anticonvulsants. EEG guidance would have been helpful in both cases.

We saw numerous patients with poor mental status, including coma, vegetative state, and minimally conscious state. These patients often had severe traumatic brain injury or had had respiratory or cardiac arrest at another facility. Some patients' files were marked with "do not resuscitate" or "do not intubate", and a few families opted for palliative care only. One facility agreed to provide care for most of these patients, and therefore physicians and nurses from that facility visited the COMFORT for 3 days to receive training on wound care, physical therapy, nursing, and medical care of these patients. We also provided the supplies that they would need to care for these patients.

As the mission progressed, we treated many patients with injuries that occurred in the earthquake aftermath. We also went ashore to offer neurology consultations in onshore facilities when the number of onboard consultations decreased. Patients were referred to onshore facilities for aftercare, and we were concerned that the facilities might not be able to provide the specialised care these patients needed; thus, we provided supplies and training (usually lasting half a day) to many of these facilities.

Where there is high demand for neurosurgery, neurologists can do much of the triage and provide neurological support for the patients both before and after their operation. Careful history taking and neurological examination remain important in these

circumstances, especially when there are limited resources for laboratory and radiological testing, because they might reveal specific aetiologies. The cases of non-convulsive status epilepticus show the importance of having EEG capability on future similar missions. The substantial effect of these neurological diagnoses makes it necessary for physicians to visit facilities to which they refer patients for aftercare and provide additional training to maximise clinical outcomes. Although this earthquake mirrored previous devastation in Haiti's history, the Haitian people have once again shown their resilience, working to overcome yet another mountain, and they have grounds to believe that a brighter future will follow.

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Erratum

Clifford DB, DeLuca A, Simpson DM, Arendt G, Giovannoni G, Nath A. Natalizumab-associated progressive multifocal leukoencephalopathy in patients with multiple sclerosis: lessons from 28 cases. *Lancet Neurol* 2010; **9**: 438–46. In this Rapid Review, Andrea DeLuca should have been listed as Andrea De Luca.