

Medical treatment of an Ebola-infected doctor—ethics over costs?

We successfully treated a patient with Ebola at Frankfurt University Hospital, Frankfurt am Main, Germany, from Oct 2, 2014, to Nov 19, 2014.¹ The patient was a Ugandan doctor, who contracted the virus while working for WHO in Sierra Leone. The 38 year old doctor was airlifted by a special medically facilitated plane from Sierra Leone to Frankfurt. On arrival at the airport, emergency services were on standby, including the fire service, police force, medics, and security. The patient was then transferred and escorted to Frankfurt University Hospital by emergency services.

Before arrival of the patient, the Special Isolation Unit within the Infectious Disease Ward was prepared and all patients were transferred to other wards in the hospital. Doctors and nurses were on standby awaiting the patient's arrival and admittance. Because of health and safety regulations, doctors work only 4 h shifts and nursing staff worked only 3 h shifts, which therefore increased the number of staff needed for 24 h patient care several-fold. As a result, external health professionals volunteered their time and skills to provide round-the-clock care for the patient.

Overall, a team of 88 health-care workers (26 doctors, 57 nurses, and five support workers) were involved in admission to hospital and day-to-day care of the patient. Within days of admittance to the unit, the patient's condition deteriorated and intensive care was needed to save the patient's life, including ventilatory and renal supportive care. Debate continues as to whether intensive care inclusive of ventilatory and renal support provides overall benefit compared with optimum supportive care. Intensive care is not provided equally in different countries for patients repatriated.²

Moreover, to meet the demands of the patient's care, four intensive care unit beds were closed in the Department of Anaesthesia, Intensive Care Medicine and Pain Therapy, and Department of Medicine and nursing staff was transferred from the intensive care unit to the Department of Infectious Disease. These four beds were withheld from the public to treat one patient. Our approach is again in contrast with Jacobs and colleagues² who stated that Ebola treatment can be provided without affecting the general services of the NHS.

After 16 days of intensive care, the patient started to show signs of improvement and recovery from the symptoms of Ebola. 24 days later, he made a full recovery and was discharged from the hospital. For all of the medical staff and volunteers, shifts were physically and emotionally demanding. Fortunately, none of the health professionals were infected or injured during treatment of the patient. Most, if not all, worked many hours without requesting any additional pay. The attitude of all the medics involved showed that they had a sense of duty to not only treat a patient, but a fellow aid worker.

The overall costs (direct and indirect) of the transfer, treatment, and management of this patient exceeded €1 million (table). A high proportion of costs have been produced by health and safety measures for personnel (eg, always having two health-care workers at the bedside and intense decontamination procedures). These high costs could be argued to be a high price to pay for treatment and care of one patient infected with Ebola. But, we gained new insights into the pathophysiology of Ebola and its treatment. The training and valuable experience medical staff gained was unique. Despite the risk of infection and strenuous shifts, the medical team showed no uncertainty in what they were doing and why. Their motives were not just about treatment of a patient, but also about facilitating the

	Cost (€)
Personnel costs	
Medical doctors	116 511.23
Nursing	141 135.12
Other	46 352.54
Total	303 998.89
Medical treatment costs	
Medication	25 248.29
Other treatment costs	7 844.64
Decontamination	110 805.84
Haemodialysis	9 410.91
Clothing/waste	6 882.00
Cardiology/angiology	257.64
Endoscopy	424.57
Radiology	2 272.98
Clinical chemistry	50 572.84
Technical support intern/ extern	33 218.94
Infrastructure	97 385.07
Total	344 323.73
Cost of closed ICU and infectious disease beds	395 991.68
Other costs (not classified)	18 475.00
Overall total	1 062 789.30
ICU=intensive care unit.	
Table: Hospital costs to treat one patient with Ebola	

recovery of a fellow health worker, so that he too could return to the work of saving lives—and to his own family!

We declare no competing interests.

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- 1 Wolf T, Kann G, Becker S, et al. Severe Ebola virus disease with vascular leakage and multiorgan failure: treatment of a patient in intensive care. 2014; published online Dec 19. [http://dx.doi.org/10.1016/S0140-6736\(14\)62384-9](http://dx.doi.org/10.1016/S0140-6736(14)62384-9).
- 2 Jacobs M, Beadsworth M, Schmid M, Tunbridge A. Provision of care for Ebola. *Lancet* 2014; **384**: 2105–06.

UK Defence Medical Services Ebola Treatment Facility

Miriam Shuchman in her World Report (Dec 20, p e67)¹ and the *Lancet* editorial (Dec 20, p 2174)² raise the

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