decisions and are absolutely necessary in reaching appropriately informed decisions. Finally, since the authors have not spent any length of time in a medical ICU during their (ongoing) training, their brazenness in presuming omniscience regarding the case is striking.

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TO THE EDITOR: In their discussion, Stavert and Lott have conflated diagnostic uncertainty with abdication of responsibility. According to their description, consultant services, far from remaining on the sidelines, were actively involved in the case, albeit meeting separately to discuss the cause of multiorgan failure. The accusation of "duplicative and unnecessary" testing is not substantiated, nor does it support the claim of physician recusal. In fact, the use of intensive and probably excessive testing would not be unexpected in any critically ill patient whose condition has not been completely diagnosed. Finally, the statement that the patient eventually recovered, "though little to the credit of his numerous physician bystanders," is nothing more than a cheap shot that is in no way substantiated by the discussion. The authors described a critically ill patient with multiorgan failure who survived. It seems that many things must have been done correctly to make that happen.

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Pneumonia from Human Coronavirus in a Macaque Model

TO THE EDITOR: During the past year, a newly identified human coronavirus (hCoV) associated with severe respiratory disease and occasionally acute renal failure has emerged in the Middle East.[1] A total of 15 laboratory-confirmed human cases have been reported from Saudi Arabia, Qatar, Jordan, and England, with 9 deaths. The first human isolate of hCoV-EMC/2012[1] was classified as a betacoronavirus, which placed it in the same genus as the coronavirus that causes the severe acute respiratory syndrome (SARS).[2] Studies revealed a broad tropism for replication in cell lines originating from different mammalian species, potentially indicating a low barrier for cross-species transmission.[3] This situation reminds the infectious-disease community of the emergence of the SARS coronavirus and calls for immediate public health preparedness and response with rapid, reliable diagnostic tests and vigilant surveillance. The availability of an animal disease model is an important aspect of developing effective countermeasures.

Here we report a nonhuman primate disease model for hCoV-EMC/2012, with the virus provided by the Erasmus Medical Center. Six rhesus macaques between the ages of 6 and 12 years were inoculated with 7 million 50% tissue-culture infectious doses ($TCID_{50}$) of hCoV-EMC/2012 through a combination of intratracheal, intranasal, oral, and ocular routes, following an established protocol.[4] Clinical signs of disease developed in all six animals within 24 hours. These signs included reduced appetite, elevated temperature, increased respiration rate, cough, piloerection, and hunched posture. Clinical signs were transient and lasted for a few days. Radiographic changes showed varying degrees of localized infiltration and interstitial markings (Fig. 1A).

After the animals were euthanized, postmortem examinations showed multifocal to coalescent bright red lesions throughout the lower respiratory tract indicative of acute pneumonia (Fig. 1B). These lesions progressed into dark reddish purple areas of pulmonary inflammation, as seen on histopathological analysis (Fig. 1C), with fibrous adhesions, consolidation, and edematous and atelectatic areas in the lungs. No extrapulmonary lesions were observed. Hematologic and blood chemical analyses showed a transient early increase in white cells, but otherwise values were within normal ranges, supporting an organ-specific process rather than a systemic infection.

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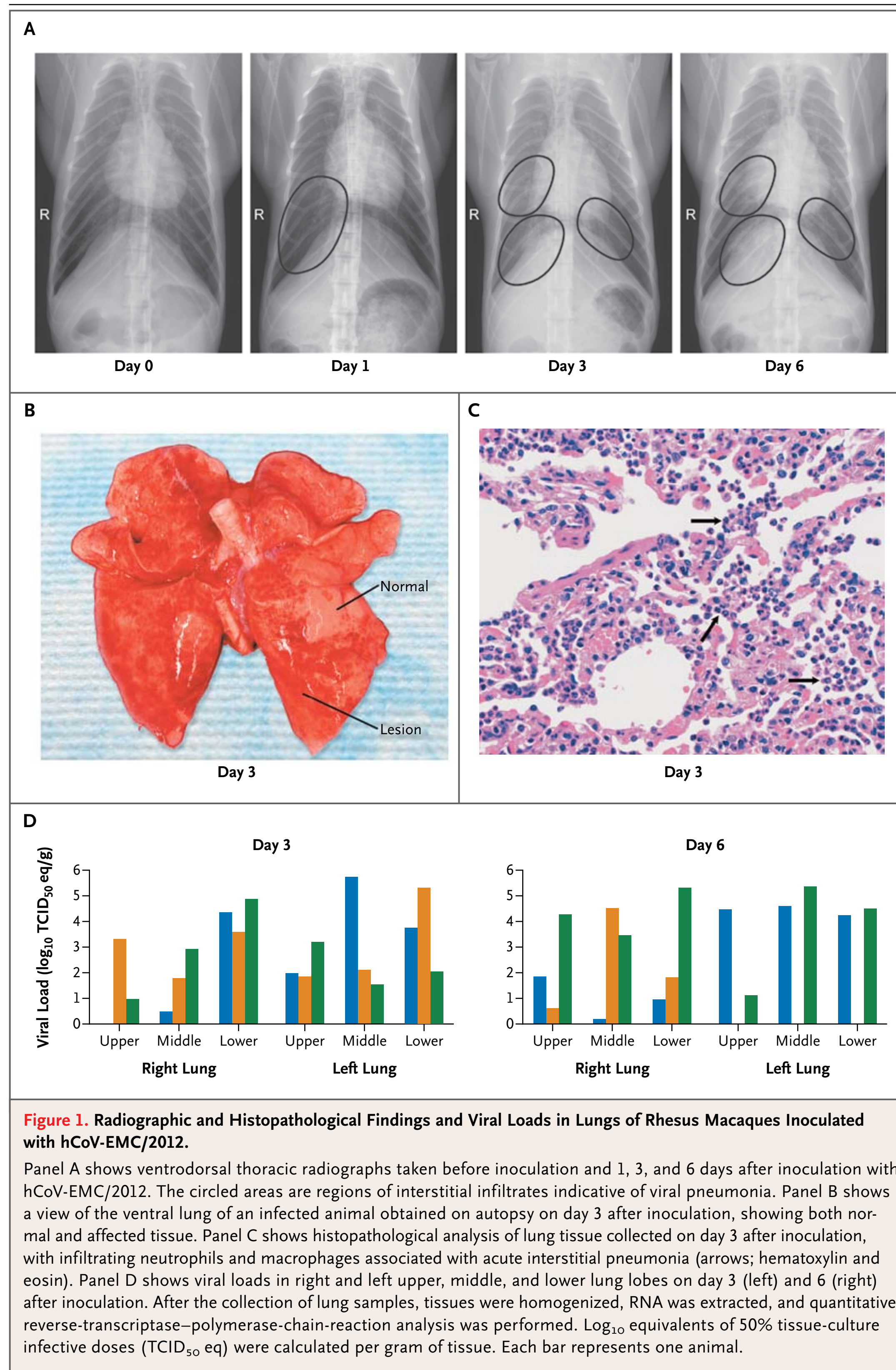

Figure 1. Radiographic and Histopathological Findings and Viral Loads in Lungs of Rhesus Macaques Inoculated with hCoV-EMC/2012.

Panel A shows ventrodorsal thoracic radiographs taken before inoculation and 1, 3, and 6 days after inoculation with hCoV-EMC/2012. The circled areas are regions of interstitial infiltrates indicative of viral pneumonia. Panel B shows a view of the ventral lung of an infected animal obtained on autopsy on day 3 after inoculation, showing both normal and affected tissue. Panel C shows histopathological analysis of lung tissue collected on day 3 after inoculation, with infiltrating neutrophils and macrophages associated with acute interstitial pneumonia (arrows; hematoxylin and eosin). Panel D shows viral loads in right and left upper, middle, and lower lung lobes on day 3 (left) and 6 (right) after inoculation. After the collection of lung samples, tissues were homogenized, RNA was extracted, and quantitative reverse-transcriptase–polymerase-chain-reaction analysis was performed. Log_{10} equivalents of 50% tissue-culture infective doses ($TCID_{50}$ eq) were calculated per gram of tissue. Each bar represents one animal.

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Quantitative reverse-transcriptase–polymerase-chain-reaction analysis[5] of lung tissue revealed the widespread presence of hCoV-EMC/2012 in the lower respiratory tract (Fig. 1D), with viral loads decreasing over time. Virus was reisolated from lung tissue collected 3 and 6 days after infection.

Collectively, hCoV-EMC/2012 caused acute localized-to-widespread pneumonia in all animals, resulting in mild-to-moderate clinical disease. This animal model establishes the causal relationship between hCoV-EMC/2012 and respiratory disease in rhesus macaques reminiscent of the respiratory disease observed in humans, thus fulfilling Koch's postulates. The model enables detailed studies of the pathogenesis of this illness and may be a critical component in the evaluation of intervention strategies for this newly emerging coronavirus.

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2013 MITOCHONDRIAL DISEASE CLINICAL CONFERENCE

The conference will be held in Cambridge, MA, on May 4.

Contact MitoAction, P.O. Box 51474, Boston, MA 02205; or call (888) 648-6228; or e-mail info@mitoaction.org; or see http://mitoaction.org/clinicalconference.

J. WORTH ESTES, M.D., HISTORY OF MEDICINE LECTURE

The lecture, entitled "The FDA and the Remaking of Modern Clinical Research," will be held in Boston on May 13.

Contact Roz Vogel, Countway Library of Medicine, 10 Shattuck St., Boston, MA 02115; or call (617) 432-4807; or e-mail rvogel@hms.harvard.edu.

"PERSONALISED MEDICINE" — MEDICINE FOR THE PERSON? ETHICAL CHALLENGES FOR MEDICAL RESEARCH AND PRACTICE

The annual conference of the European Association of Centres of Medical Ethics will be held in Bochum, Germany, Sept. 19–21. Deadline for early registration is June 15.

Contact the Institute for Medical Ethics and History of Medicine, Ruhr University Bochum, Markstrasse 258a, 44799 Bochum, Germany; or call (49) 234 32 23 394; or fax (49) 234 32 14 205; or e-mail info@eacme2013.org; or see http://www.eacme2013.org.

76TH ANNUAL COLON AND RECTAL SURGERY CONFERENCE

The conference will be held in Minneapolis, Oct. 23–26. It is sponsored by the University of Minnesota Division of Colon and Rectal Surgery.

Contact Susan Crolla, 5353 Wayzata Blvd., Suite 350, Minneapolis, MN 55416; or call (850) 212-6477; or e-mail info@colonrectalcourse.org; or see http://www.colonrectalcourse.org.

ERASMUS SUMMER PROGRAMME 2013

The program will be held in Rotterdam, the Netherlands, Aug. 12–30.

Contact Soeja de Groot, Het Congresbureau, Erasmus Medical Center, Room Cd 304, P.O. Box 2040, NL-3000 CA, Rotterdam, the Netherlands; or call (31) 10 7043669; or fax (31) 10 7044737; or e-mail s.degroot@erasmusmc.nl; or see www.erasmussummerprogramme.nl.

17TH WORLD CONGRESS OF PSYCHOPHYSIOLOGY (IOP2014)

The congress will be held in Hiroshima, Japan, Sept. 23–27, 2014. It is presented by the International Organization of Psychophysiology.

Contact the Cognitive Psychophysiology Laboratory, Graduate School of Integrated Arts and Sciences, Hiroshima University, 1-7-1 Kagamiyama, Higashi-Hiroshima 739-8521, Japan; or see http://www.iop2014.jp.

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