

tistically significant 6% increase in the relative risk of death.³ Finally, a comparable cohort of 12 108 patients was analyzed in New Zealand and Australia. Again, the hyperoxia group showed an increased risk of mortality compared with the normoxia group (OR, 1.2; 95% CI, 1.1-1.6). Although the statistical significance of this finding was not maintained after multivariable adjustment, certainly no beneficial effects of hyperoxia were found.⁴

In the management of ischemic stroke, a randomized trial suggested that hyperbaric oxygen may adversely affect stroke severity.⁵ With regard to normobaric oxygen, 3 randomized trials were performed. One showed no benefit on clinical outcome.⁶ Another trial in nonhypoxic patients found lower survival at 1 year (OR, 0.45; 95% CI, 0.23-0.90) in those who received supplemental oxygen during initial treatment.⁷ The third randomized trial was terminated in 2009 after enrolling 85 patients because of excess mortality in the hyperoxia group (40% vs 17% [$P=.01$ by our own calculation]) (Clinical Trial of Normobaric Oxygen Therapy in Acute Ischemic Stroke [not published]; clinicaltrials.gov Identifier: NCT00414726). Although an external monitor judged the excess mortality as "unrelated to oxygen treatment," these results are important because this was the largest randomized trial investigating oxygen treatment for ischemic stroke, and it is remarkable that these results have not (yet) been published.

In the management of COPD, the risks of oxygen supplementation are widely acknowledged. Administration of oxygen in patients with COPD may cause hypercapnia due to ventilation-perfusion mismatching, the Haldane effect, inhibition of hypoxic drive, and atelectasis. Guidelines recommend a maximum FI_{O_2} of 0.28. However, patients with COPD often receive higher doses, especially during ambulance transportation, causing hypercapnia and increased mortality. Recently, a randomized trial compared high concentration oxygen with titrated oxygen in prehospital patients with exacerbation of COPD. Mortality was lower in patients receiving titrated oxygen (RR, 0.42; 95% CI, 0.20-0.89). In those with later-confirmed COPD, mortality reduction was even stronger (RR, 0.22; 95% CI, 0.05-0.91).⁸

Comment. In conclusion, there appear to be potential dangers of routine administration of supplemental oxygen during a variety of medical emergencies. Hyperoxia is associated with hemodynamic alterations that may increase myocardial ischemia and impair cardiac performance, and the results from relatively unknown preclinical studies appear to be supported by the available clinical evidence. Moreover, hyperoxia also seems to be associated with adverse outcomes in different noncardiac emergencies. Finally, in our extensive literature review, we did not find a single study contradicting the reported hazards of hyperoxia or, in fact, suggesting benefits.

We acknowledge that additional clinical research is warranted to determine whether routine high-dose supplemental oxygen in medical emergencies indeed causes more harm than benefit. Until that time, however, we call for appropriate caution in applying supplemental oxygen. Hypoxemia should be treated carefully with stepwise in-

creases in inhaled oxygen concentration in an attempt to avoid arterial hyperoxia.

Alexander D. Cornet, MD
Albertus J. Kooter, MD
Mike J. L. Peters, MD, PhD
Yvo M. Smulders, MD, PhD

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Author Affiliations: Departments of Internal Medicine (Drs Cornet, Kooter, Peters, and Smulders) and Intensive Care Medicine (Dr Cornet), VU University Medical Center, and Institute for Cardiovascular Research ICAr-VU (Drs Cornet, Kooter, Peters, and Smulders), Amsterdam, the Netherlands.

Correspondence: Dr Cornet, VU University Medical Center, PO Box 7057, 1007 MB Amsterdam, the Netherlands (cornet@vumc.nl).

Author Contributions: *Study concept and design:* Cornet, Kooter, Peters, and Smulders. *Acquisition of data:* Cornet, Kooter, and Peters. *Analysis and interpretation of data:* Cornet, Kooter, and Peters. *Drafting of the manuscript:* Cornet, Kooter, Peters, and Smulders. *Critical revision of the manuscript for important intellectual content:* Cornet, Kooter, Peters, and Smulders. *Administrative, technical, and material support:* Cornet and Peters. *Study supervision:* Kooter and Smulders.

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Necessity for Primary Care Immediately After the March 11 Tsunami and Earthquake in Japan

On March 11, 2011, Japan was devastated by a massive magnitude 9.0 earthquake and tsunami. Immediately after the earthquake, the rescue of injured people was the most urgent task. However, a critical feature of this tragedy was that because

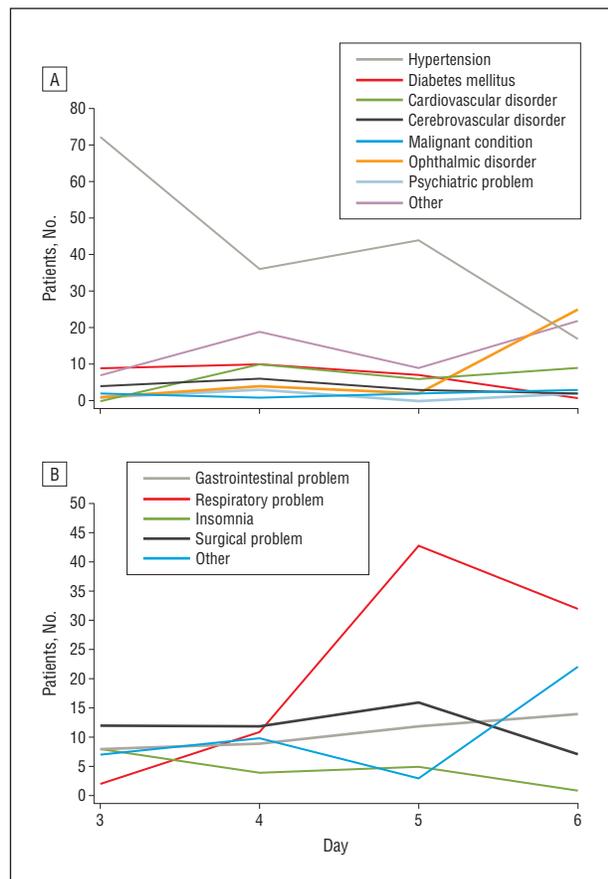


Figure. A, Baseline medical problems that required a visit (A) and the acute medical reason for a visit (B) to a satellite clinic during days 3 to 6.

the chances to carry out emergency medical care were scarce, there was a clear division between those who died in the tsunami and those who were spared. Most of the survivors were sheltered in schools, gymnasiums, and regional resource centers during the cold season in northern Japan, and the effort of voluntary medical staff after the tsunami was largely focused on providing usual care with extremely limited medical resources. We sought to describe the characteristics of medical care in an evacuation shelter during the subacute phase of the March 11 tsunami disaster.

Method. We collected the medical information from tentative medical charts that were recorded in a single large evacuation shelter at Kesenuma City in Miyagi Prefecture. The K-wave gymnasium (Miyagi, Japan) sheltered approximately 1500 survivors who lost their home after the tsunami. A temporary medical clinic was established on day 3 after the tsunami, and 2 to 3 physicians along with 3 to 5 nurses and pharmacists ran the clinic from 9 AM to 5 PM daily. From the medical charts, patients' characteristics and the dispensed drugs were recorded. Of note, owing to the lack of gasoline during the acute phase of this disaster, transportation to medical care facilities was extremely limited and the closest hospital from the shelter was more than 1 hour away by car.

Results. Most of the patients who visited the temporary clinic in the shelter had baseline chronic disorders and lacked access to medications, including prescriptions and drug supplies, and had a need for nonmedical personnel after the acute phase. Their baseline disorders included hypertension, diabetes, peripheral vascular diseases, and neurological problems (**Figure**, A). Another aspect of the defining characteristics was the large number of elderly victims; 59.6% of the patients were older than 65 years. Those who came to temporary clinic with new complaints had mostly gastrointestinal and pain-related issues. The number of patients with infective symptoms exponentially increased on day 6 (**Figure**, B). The crowded and cold environment in gymnasiums with minimum sewerage systems likely led to spreading infectious diseases including influenza, streptococcal pneumonia, and viral diarrhea.^{1,2} Consequently, among all the drugs, the dispensation rate was relatively high for common cold relief. Also, many antihypertensive drugs were given to patients with underlying hypertension.

Comment. Unlike the previous catastrophic events worldwide, the need for a primary care system rather than disaster specialists was high immediately after the March 11 tsunami and earthquake. Most of the medical care that was provided in shelters were gastrointestinal, chronic pain, and later, infection related. More importantly, continuity of previous medical care was an essential part of these satellite clinics.

Shun Kohsaka, MD
Yutaka Endo, MBBS
Ikuko Ueda, PhD
Jun Namiki, MD, PhD
Keiichi Fukuda, MD, PhD

Author Affiliations: Divisions of Cardiology (Drs Kohsaka, Endo, Ueda, and Fukuda) and Emergency Medicine (Dr Namiki), Keio University School of Medicine, Tokyo, Japan.

Correspondence: Dr Kohsaka, Division of Cardiology, Keio University School of Medicine, 35 Shinanomachi, Shinjuku-ku, Tokyo, Japan 160-0016 (cardiotx@gmail.com).

Author Contributions: *Study concept and design:* Kohsaka, Namiki, and Fukuda. *Acquisition of data:* Kohsaka and Namiki. *Analysis and interpretation of data:* Kohsaka, Endo, Ueda, and Namiki. *Drafting of the manuscript:* Kohsaka and Endo. *Critical revision of the manuscript for important intellectual content:* Kohsaka, Ueda, Namiki, and Fukuda. *Statistical analysis:* Kohsaka, Endo, and Ueda. *Administrative, technical, and material support:* Fukuda. *Study supervision:* Kohsaka and Namiki.

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