

Legal Bases for Medical Supervision via Mobile Telecommunications in Japan

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ABSTRACT

This paper discusses the legal basis for mobile telecommunications-based medical supervision in Japan and bulletin from the Ministry of Health, Labour and Welfare. According to Article 44 of the Emergency Life-Saving Technician's Act, an emergency technician shall not perform certain emergency medical procedures unless specifically authorized to do so by a medical practitioner. Actual conditions make these requirements unwieldy to put into practice. When requested to provide medical control in response to an ambulance call, a licensed physician has no choice but to allow the emergency technician to administer medical care. These circumstances expose medical practitioners to significant legal risks and societal ramifications. Is a mobile telecommunications environment characterized by insufficient information satisfactory for the medical care needed in ambulances? This paper discusses such medical care and its legal ramifications, including: how to implement such medical care under Article 21 of the Basic Act on Establishing a Networked Society Based on Advanced Information and Telecommunications. The Japanese government is obligated to provide citizens with broadband telecommunication lines in the near future to enable the smooth implementation of medical control over medical supervision provided in ambulances.

Keywords: *Advanced Information and Telecommunications, Emergency Medical Procedures, Medical Care, Medical Supervision, Mobile Broadband Telecommunications, Networked Society*

1. PURPOSE

An emergency technician shall not perform certain emergency medical procedures unless specifically authorized to do so by a medical practitioner (Article 44 of the Emergency Life-Saving Technician's Act). The Japanese government faces the obligation to provide the Japanese people with the benefits of information

and telecommunications technologies in the public sector (Article 21 of the Basic Act on Establishing a Networked Society Based on Advanced Information and Telecommunications). This paper will take various legal approaches in analyzing the current risk of providing medical counsel to emergency vehicles and in discussing an implicit issue: how to implement such medical counsel under Article 21 of the Basic Act on Establishing a Networked Society Based on Advanced Information and Telecommunications.

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2. BACKGROUND

2.1. The Four T's of Emergency Medical Treatment

Four factors in medical treatment—the four T's—significantly affect patient prognosis:

Telecommunication
Transportation
Triage
Early Treatment

Emergency medical treatment can proceed smoothly only when broadband mobile telecommunications, ambulances, triage, and early treatment work effectively and in concert. Effective early treatment improves patient prognosis and reduces medical costs. For the past 20 years, lots of experimental and practical operation have been reported and published in the field of ambulatory applications (Preston, 1995; Ricci, Caputo, & Amour, 2003; Ellis & Mayrose, 2003; Tachakra, Wang, & Robert, 2003; Meystre, 2005; Tang, Johnson, & Douglas, 2006; Sibert, Ricci, & Caputo, 2008; Su, Ma, & Chow-In Ko, 2008; Pan, Cusack, & Hook, 2008; LaMonte, Bahouth, & Xiao, 2008; Belala, Issa, & Gregoire, 2008; Nakajima & Tomioka, 2009; Hsieh, Lin, & Wu, 2010; Costa, Rodrigues, & Reis, 2010; Lee, Kim, & Lee, 2011; Kim, Lee, & Kim, 2011).

2.2. Patient Complaining of Pain After Defibrillation in an Ambulance

If an AED (automated external defibrillator) incorporating artificial intelligence determines that an electrocardiogram has gone from flat to vf (ventricular fibrillation) for a successfully resuscitated patient, an electric shock is administered to the patient's chest. However, in certain cases, patients defibrillated in an ambulance will complain of pain thereafter. This may occur because the electric shock is applied automatically, even in cases in which the patient maintains certain levels of cardiac

output and brain blood flow. Guided by artificial intelligence, a defibrillator provided on board an ambulance converts electric potential by FFT (fast Fourier transforms) for frequency spectrum analysis, then administers treatment in cases of frequencies above a specified level (which the defibrillator interprets as vf). Other readings are interpreted to indicate vt (ventricular tachycardia). Note that no universally accepted diagnostic criteria exist for this demarcation.

A patient's complaint of pain indicates either that the artificial intelligence has misinterpreted vt as vf, despite cardiac output, or that vf has returned to vt on its own. Since patients with vf rarely return to normal so quickly, the latter explanation is unlikely.

Such issues highlight the limitations on artificial intelligence when no medical practitioner is present to examine the patient in person.

FP (false positive) and FN (false negative) assessments are inevitable in the emergency transportation system as currently established. Cost considerations do not permit medical practitioners to work in each ambulance. What, then, does the Japanese government (the Ministry of Internal Affairs and Communications and the Ministry of Health, Labour and Welfare) propose to do to ensure the quality of emergency medical care on board ambulances?

3. RESEARCH: RELEVANT LEGAL SYSTEMS

The author examined the Japanese legal system and bulletins related to medical supervision via mobile telecommunications. Figure 1 illustrates the relationship between major laws or bulletins and the positions (emergency technician, medical practitioner, and patient) discussed in this paper.

1. Article 44 of the Emergency Life-saving Technician's Act
2. Article 21 of the Enforcement Regulations for the Emergency Life-Saving Technician's Act
3. Article 35 of the Penal Code

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