



## Diffusion and practice of ultrasound in emergency medicine departments in Italy

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### KEYWORDS

Emergency Ultrasound;  
Emergency Medicine  
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Ultrasound.

**Abstract** *Introduction:* This paper reports data from a cognitive survey on the diffusion, practice and organization of ultrasound (US) in emergency medicine departments (EMDs) in Italy. The study was carried out by the Emergency Medicine Section of the Italian Society for Ultrasound in Medicine and Biology (SIUMB) in collaboration with the Italian Society for Emergency Medicine and Urgent Care (SIMEU).

*Methods:* We created a questionnaire with 10 items, relating to 4 thematic areas. The questionnaires were administered from September 2007 to February 2008, by email, telephone or regular mail. In August 2008 the data were subjected to nonparametric statistical analysis (Spearman's Rho and Pearson's chi-square – software SPSS).

*Results:* We analyzed 170 questionnaires from the EMDs of all Italian regions. A US scanner is present in 64.7% of the ERs, emergency US (E-US) is practiced only in 47.6% of the ERs, and only in 24% of these more than 60% of the ER team members have training in US. The diffusion of US in other operative units of the EMDs ranges from 8.2% to 26.5%.

*Discussion:* The presence of a US scanner in the ER is essential for the practice and training and is correlated with the level of the EMD. The use of US appears to be less common in less equipped hospitals, regardless of the size of the ER and the availability of radiological services. Wider diffusion of US and greater integration with other services for the installment of the required equipment is to be hoped for.

**Sommario** *Introduzione:* Riportiamo i dati di un'indagine conoscitiva sulla diffusione, pratica e organizzazione dell'ecografia (US) nei dipartimenti di emergenza (EMDs) in Italia. Questo studio è stato condotto dalla Sezione di Ecografia di Urgenza Emergenza della Società Italiana di Ecografia in Medicina e Biologia (SIUMB) in collaborazione con la Società Italiana di Medicina di Emergenza e Urgenza (SIMEU).

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**Metodi:** Abbiamo creato un questionario con 10 campi, relativi a 4 aree tematiche. I questionari sono stati somministrati nel periodo settembre 2007-febbraio 2008, via e-mail, telefono o posta ordinaria. I dati sono stati analizzati con metodi statistici non parametrici nell'Agosto 2008.

**Risultati:** Abbiamo analizzato 170 questionari provenienti dagli EMDs di tutte le regioni italiane. Un ecografo è presente nel 64,7% dei Pronto Soccorso, l'ecografia d'emergenza (E-US) è praticata solo nel 47,6% dei Pronto Soccorso, e solo nel 24% di questi più del 60% dei membri dell'èquipe è formata in ecografia. La diffusione degli US in altre Unità Operative degli EMDs va dall'8,2% al 26,5%.

**Discussione:** La presenza di un ecografo in Pronto Soccorso è essenziale per la pratica e la formazione e è correlata al livello del Dipartimento di Emergenza (I o II). L'uso dell'Ecografia sembra essere minore negli ospedali meno attrezzati, indipendentemente dalla grandezza del Pronto Soccorso e dalla disponibilità di Servizi di Radiologia. Si auspica una maggiore diffusione dell'ecografia e una maggiore integrazione con altri servizi quanto all'allocazione delle risorse richieste.

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## Introduction

Interest in ultrasound (US) is increasing among physicians and scientific societies involved in emergency medicine and urgent care. After the first reports on its efficacy for rapid diagnosis of life-threatening conditions like traumatic hemoperitoneum [1–4] or abdominal aortic aneurysm [5,6], US has been included in numerous diagnostic and therapeutic protocols [7,8] used in emergency medicine. Technological advances have revolutionized care in emergency medicine departments (EMDs) in the United States, allowing US to emerge from the outpatient clinic and arrive at the bedside of the patient and other points of care. Here, with the manageability of a stethoscope, US can be focused on individual problems (focused US) or used with other clinical tools to manage complex cases and multiorgan diseases [9–12]. In this manner, US has become an asset for physicians caring for critically ill patients. The main characteristics of this type of US, which will be referred to hereafter as "emergency US" (EUS), can be effectively summarized as follows: "highly focused, interactive, brief, may be repeated as clinically warranted and emphasizes only one finding" [13].

The aim of this study was to evaluate the current diffusion of US in EMDs in Italy, the modalities of use, and the training level of the physicians. From September 2007 to August 2008 the Emergency Medicine Section of the Italian Society for Ultrasound in Medicine and Biology (SIUMB) in collaboration with the Italian Society for Emergency Medicine and Urgent Care (SIMEU) conducted a survey in EMDs throughout Italy. The results of this survey are reported below.

## Materials and methods

The survey was conducted by means of a questionnaire with 10 items related to the 4 areas: 1) characteristics of the activity and organization of the Emergency Room (ER) (items 1, 2, 3, 4, and 9); 2) organization of US services in the ER (items 5 and 6); 3) US training level of ER physicians (items 7 and 8); 4) diffusion of US in other operative units of the EMD (item 10) (Fig. 1). The level of the EMD was defined in accordance with the guidelines issued by the Ministry of Health in 1996 [14]. The presence in the EMD of

a short-term observation (STO) unit was regarded as evidence of recent structural reorganization since this type of service is a relatively recent acquisition [15]. The activity of the STO is associated with that of the ER and directed at patients who require diagnostic procedures that can be completed within a period of 24 h.

The questionnaires were distributed by regional representatives of the SIUMB and members of the society's Emergency Medicine Section, and members of the SIMEU. The questionnaires were delivered by e-mail, telephone, or regular mail to the heads of the ER (previously contacted by telephone) or their delegates. The completed questionnaires were then collected and evaluated by a 3-person team (FA, SS, and MS) to verify their validity and to eliminate any duplicates. The data were extracted, assembled, evaluated, and analyzed in August 2008 (SS). Items on the questionnaire with a response rate below 15% were considered insufficient.

**Statistical analysis.** Continuous variables (number of ER admissions, percentage of the ER physician team with training in US) were grouped according to the modal distribution. The data were subjected to nonparametric statistical analysis to find possible correlations (rank correlation index  $R$  or Spearman's rho and Pearson chi-square test – software SPSS). The rank correlation index  $R$  measures the degree of association between two variables for which the only hypothesis is ordinal measure but possibly continuous (this is significant if greater than 0.5). The Pearson chi-square test is a nonparametric statistical test used to verify whether the recorded frequencies are significantly different from those derived from a theoretical distribution. This test allows us to accept or reject a given hypothesis (significant index  $\leq 0.05$ ) [16].

## Results

One hundred eighty (64.3%) of the 280 questionnaires distributed were returned by the end of August 2008. Table 1 shows the regional origins of the responses received. In Table 2 the composition of the sample surveyed is described and compared with the characteristics and the number of operative hospitals in Italy in the year 2003 [17]. Ten questionnaires from hospitals without EMDs were

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