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## More needles less pain: The use of local anaesthesia during emergency arterial sampling

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### ABSTRACT

**Objective:** To explore the attitudes toward the use of local anesthetic (LA) in arterial blood gas sampling and the awareness and adherence to British Thoracic Society guidelines.

**Methods:** An anonymous eight-item survey was distributed among medical professionals in two teaching and two district general hospitals.

**Results:** In total 153 medical professionals were surveyed. Sixty-five percent have never had any training in administering LA. Most thought that arterial blood gas sampling was either “quite painful” (61%) or “extremely painful” (20%). However, 58% believed that patients should only “sometimes” be offered LA. Over half of the respondents (56%) never used LA before arterial blood gas sampling and 34% only used it “sometimes”. The majority (53%) stated that they would “sometimes” use LA in the future and 23% said that they would never use it.

**Conclusions:** Our results demonstrated that British Thoracic Society guidelines are not followed across the four hospitals. Despite the acknowledgment of arterial sampling being a painful procedure and the belief that patients should be offered LA at least “sometimes”, over half of the respondents never use it. Addressing the above-mentioned issues by introducing local guidelines and teaching sessions, as well as making LA more available, will help make this practice routine.

## 1. Introduction

Arterial blood gas (ABG) sampling is performed frequently in UK hospitals and allows healthcare professionals to quickly obtain information on the blood oxygen and carbon dioxide levels, as well as the acid base balance. The sample is commonly obtained from the radial artery. It is well established both that the procedure causes significant pain and that this pain can be markedly reduced by the use of subcutaneous local anaesthetic (LA)<sup>[1]</sup>. Furthermore, contrary to popular belief, the use of LA does not make the procedure more difficult<sup>[2,3]</sup>. Consequently, the British Thoracic Society recommends the routine use of LA for obtaining ABG samples except in emergencies, or in

unconscious or anaesthetised patients<sup>[4]</sup>. Despite this, the use of LA before ABG sampling is not universal. The aim of this study was to quantify the awareness and prevalence of the use of LA in ABG sampling, and explore the reasons for lack of adherence to the guidelines and barriers to their wider implementation.

## 2. Materials and methods

An anonymous eight-item survey was distributed among medical professionals in two teaching hospitals and two district general hospitals in London, UK. Specialties, which were thought to perform ABG sampling most frequently, and various training grades were surveyed. The questions explored the attitudes towards the use of LA during ABG sampling and quantified the prevalence of the practice. Respondents who had not been previously aware of the British Thoracic Society guidelines were informed about them and asked if they would subsequently change their practice. The data were analysed in Microsoft Excel 2010 (Microsoft Inc., Redmond WA, USA).

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The study was performed according to the University College London (London, UK) ethical committee guidelines.

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### 3. Results

In total, 153 medical professionals were surveyed. Of these, 31% were from intensive care, 21% from emergency medicine, 16% from respiratory medicine, 14% from acute medicine and 18% from “other” specialties involved in the hospital “on-call” rota (Figure 1). The majority of the respondents were foundation year 1 and 2 doctors (39%), and specialty trainees (22%). The rest included core trainees (15%), specialist nursing staff (14%) and consultants (10%).

Over 80% performed more than five ABG samples per month. Sixty-five percent have never had any training in administering LA. Most thought that ABG sampling was either “quite painful” (61%) or “extremely painful” (20%) (Figure 2). However, the majority (58%) believed that patients should only “sometimes” be offered LA. Only 21% thought that LA should be “usually” given and 14% believed that it must “always” be used (Figure 3).

Despite the above expressed attitudes, over half of the respondents (56%) never used LA before ABG sampling and 34% only used it “sometimes” (Figure 4). The main reasons given for this were: pain of LA, unavailability of LA, lack of training and disbelief of benefit. The majority (59%) stated that they would “sometimes” use LA in the future and 23% said that they would never use it, even though they were notified of the latest British Thoracic Society guidelines (Figure 5).

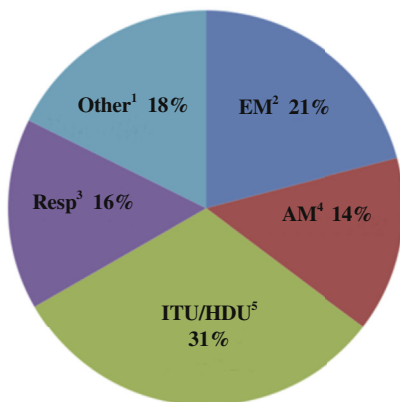


Figure 1. Specialties surveyed.

1: Other specialties involved in the hospital on-call rota; 2: Emergency medicine; 3: Respiratory medicine; 4: Acute Medical Unit; 5: Intensive Treatment Unit/High Dependency Unit.

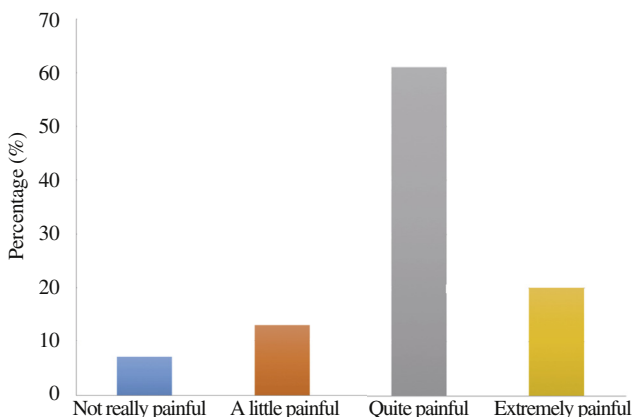


Figure 2. A graph demonstrating the perception of arterial sampling pain levels among healthcare professionals.

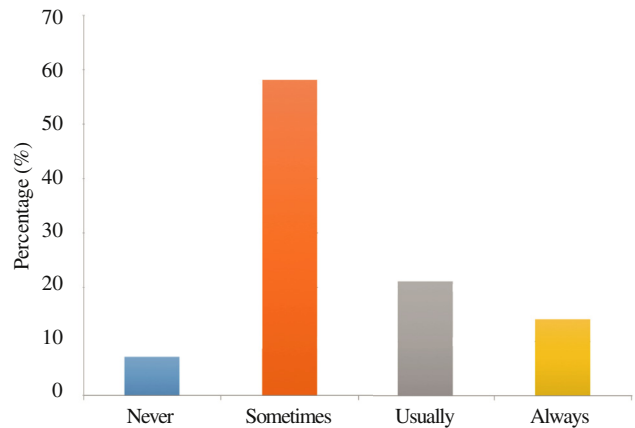


Figure 3. A graph demonstrating the opinion on whether patients should be offered LA during arterial sampling.

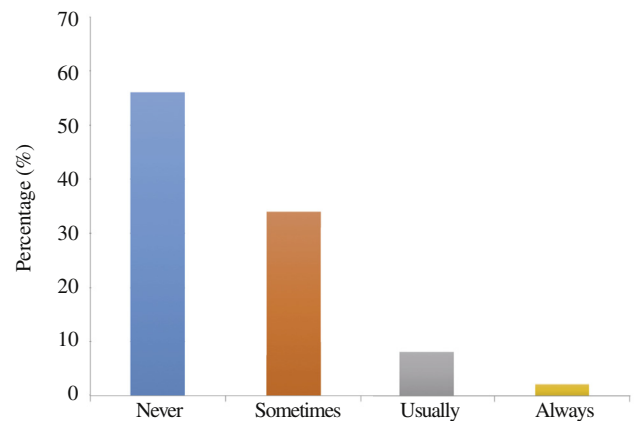


Figure 4. A graph demonstrating the use of LA during arterial sampling.

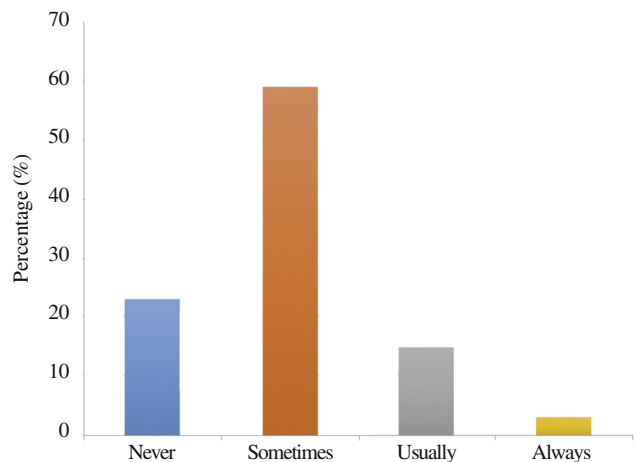


Figure 5. A graph demonstrating the willingness of healthcare professionals to use LA during arterial sampling in the future.

When the comparison between different specialties was done, Intensive Treatment Unit/High Dependency Unit healthcare professionals (60%) were more likely to use LA (“sometimes”, “usually” and “always”) than those in acute medicine (51%), respiratory medicine (42%), other specialties (34%) and emergency medicine (25%). However, no statistical analysis was carried out due to small sample size to see if these findings are significant.

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