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RESEARCH LETTER

# Variation in the use of point-of-care ultrasound in general practice in various European countries. Results of a survey among experts

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**KEY MESSAGES**

- Point-of-care ultrasound is used differently in different countries/regions.
- Significant differences exist between countries/regions regarding the organization of national societies for the use of point-of-care ultrasound in general practice.
- Respondents cited financial aspects, time use and lack of skills as the greatest barriers to general practitioners' use of point-of-care ultrasound.

**ABSTRACT**

**Background:** Before implementing point-of-care ultrasound in general practice in Denmark, we sought inspiration from other countries/regions.
**Objectives:** To collect information about the use and organizational aspects of point-of-care ultrasound in general practice in different European countries/regions.
**Methods:** Fifteen key persons with knowledge about the use of ultrasound in general practice in Austria, Catalonia, Denmark, Finland, Germany, Greenland, Iceland, the Netherlands, Norway, Scotland, Sweden, and Switzerland were included. Participants received a link to a web-based questionnaire. The primary outcome measures were educational aspects regarding the use of point-of-care ultrasound; clinical application and use; financial aspects; and main barriers to using ultrasound in general practice.
**Results:** In eight out of 12 countries/regions there were national societies for the use of ultrasound in general practice. The respondents from three countries/regions reported that the use of ultrasound was integrated into undergraduate medical education. In nine of the countries/regions, there was formalized training for general practitioners, but only three reported this to be part of the specialization to become a general practitioner. In seven out of 12 countries/regions, general practitioners received payment for ultrasound scans. However, the payment and the requirements for reimbursement differed between countries. Lack of time, lack of training, and financial aspects were important common barriers across countries/regions.
**Conclusion:** There were significant differences regarding the use and organizational aspects of point-of-care ultrasound in general practice in Europe. Lack of time and training as well as financial aspects were important barriers to the use of point-of-care ultrasound in general practice.

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## Introduction

The use of point-of-care ultrasound is rapidly increasing and broadly dividing into procedural, diagnostic and screening purposes.[1]

Reports of the use of point-of-care ultrasound in a general practice context often involve only one or a few enthusiastic users.[2–3] A few papers describe a more general use or analyse organizational aspects, [4–6] e.g. what should a general practitioner (GP) learn to scan? How should it be taught? Are certification and recertification needed? What reimbursements are reasonable? What are patient preferences? Does it overall lead to better patient care? Etc.

In March 2013, a meeting was held in Aalborg, Denmark, by the Danish College of General Practitioners (DSAM) to plan and draw up guidelines for teaching point-of-care ultrasound to GPs in Denmark. In relation to this meeting, the questions

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arose: how is point-of-care ultrasound used in general practice in other countries, and how are education, payment, and other organizational aspects arranged? Hence, we decided to conduct a survey to answer some of these questions.

The aim of this study was to collect information about ultrasound in general practice in different European areas to describe differences in use and organizational aspects of point-of-care ultrasound across countries/regions.

## Methods

### Study design

The study was a cross-sectional survey using the web-based tool SurveyXact.[7] Following pilot testing in Denmark, Scotland and Norway, a link to the web-based questionnaire was sent to the participants.

### Ethics

The participating GPs were informally asked to answer our questions to the best of their ability. In our reporting, they were considered representatives for their country/region. Hence, we are responsible for any incorrect or imprecise information. The study was approved by the Danish Data Protection Agency.

### Selection of study subjects

We searched for persons with good knowledge about the use of ultrasound in general practice in the different countries/regions. Some were found via collaborative networking (Iceland, Catalonia, Finland, Greenland, and Denmark), via the Internet (Norway, Sweden, the Netherlands, Scotland), and some via national societies for medical ultrasound (Germany, DEGUM; Austria, ÖGUM; and Switzerland, SGUM). Each person was contacted to gain information about their knowledge on ultrasound in general practice in their country/region. We attempted to find key persons in Belgium, England and Ireland without success. No respondents were excluded.

### Outcomes

The full questionnaire is provided in the Supplemental material, available online. Answers were collected from June to September 2014.

## Results

The 15 respondents (3 women and 12 men) represented 12 countries/regions in Europe, as there were two persons from Denmark, Finland and Sweden who filled out the questionnaire. All participants except one were current users of ultrasound, most were involved in teaching how to use ultrasound, and five had conducted research concerning the use of ultrasound in general practice.

### Organization (national societies) and use

Eight out of the 12 countries/regions had national societies: Austria (ÖGUM, Austrian Society for Ultrasound in Medicine, Section of General Practice); Catalonia (CAMFIG, Catalan Society of Family and Community Medicine and CAP, Primary Care Centre); Denmark (DSAM, Danish College of General Practitioners); German (DEGUM, German Society for Ultrasound in Medicine, Section of General Practice); the Netherlands (CHBB, College voor Huisartsen met Bijzondere Bekwaamheden/College for General Practitioners with Special Skills and VvHE, Vereniging voor Huisarts-Echografisten/Society for General Practitioners Using Ultrasound in the Netherlands); Norway (FUA, Society for Ultrasound in General Practice in Norway); Scotland (SACH, Scottish Association of Community Hospitals and CHIN, Community Hospital and Intermediate Care Networks); and Switzerland (SGUM, Swiss Society for Ultrasound in Medicine, Section of General Practice and Internal Medicine).

The respondents estimated how common the use of ultrasound was among GPs in their country/region and the proportion of users differed considerably, from less than 1% in Austria, Catalonia, Denmark and Sweden to 45% in Germany, and 67% in Greenland.

### Education, training and certification

Only the respondents from Denmark, Germany and Scotland reported that ultrasound training was part of undergraduate education (at the medical school at universities). All but three countries/regions (Iceland, Sweden and Switzerland) have specific educational programmes on the use of ultrasound in general practice.

Certification is mandatory to receive reimbursement for performing ultrasound scans in the Netherlands, and recertification is needed every five years for abdominal ultrasound. GPs performing ultrasound scans are required to carry out a minimum of 50 abdominal ultrasound examinations each year and attend at least five hours of certified courses every year. Certification is also needed in Germany, Austria and Switzerland (and recertification in Switzerland).

In Iceland, Finland and Norway there are no requirements for certification.

### Clinical use of ultrasound in general practice

In most countries/regions the indication for GPs to use point-of-care ultrasound included obstetrics, gynaecology, musculoskeletal/joints, abdominal, urogenital, cardiac and vessels. However, some countries/regions (Austria, Catalonia and Switzerland) did not seem to use ultrasound for obstetric and/or gynaecological examinations.

In a minority of countries ultrasound was also reported to be used for 'lungs/thorax' (Denmark, Finland, Norway, and Germany), 'traumatology' (not indicated what kind, but some of this may fit in under other categories—'FATE' (cardiac) and 'FAST' (abdominal)) (Austria, Finland, Greenland, Iceland and Norway). Some used US for 'thyroid' scans (Scotland and Spain), 'subcutaneous tissues' (Denmark, Norway), 'breasts', 'small parts', 'eyes', 'sinusitis', 'nerves' and 'ENT'.

### Financial aspects

In seven out of 12 countries, GPs received payment for performing ultrasound scans from either public health service, private insurance, or the patient (Table 1).

### Main barriers to using ultrasound scans in general practice

The financial aspects, lack of time and lack of training were considered important barriers (Table 2).

## Discussion

Point-of-care ultrasound is used in general practice in all of the 12 included European countries/regions, but this study points to significant differences regarding extent of use and organizational aspects. This includes the availability of education and training, indication for use, the need for documentation of qualification, as well as financial aspects.

This study arose from our needs in relation to planning how to integrate and organize the use of ultrasound in general practice in Denmark. Looking for inspiration, we contacted persons who we believed had a high level of knowledge regarding the use of ultrasound in general practice in other countries/regions. However, they were not selected by any national society or otherwise had a formal mandate to represent that specific area in relation to our survey. Hence, the data we obtained may not be representative or accurate for that given country/region. There are other main limitations. For example, there were no representatives from countries in Eastern Europe; the questionnaire was pilot-tested, but the validity and reliability of the questionnaire were not further assessed. Hence, there is a high risk of the data being biased, but the responses may still give valid inspiration and point to important aspects.

In this survey, the most commonly reported barriers were financial matters, lack of training and lack of time

**Table 1.** Payment for ultrasound examinations in general practice in different countries/regions.[a]

| | Payment by public health service | Payment by private insurance | Payment by the patient |
|---|---|---|---|
| Austria | – | x | x |
| Catalonia | – | – | – |
| Denmark | – | – | – |
| Finland | x | – | – |
| Germany | x | x | x |
| Greenland | – | – | – |
| Iceland | x | – | x |
| The Netherlands | x | – | x |
| Norway | x | x | x |
| Scotland | – | – | – |
| Sweden | – | – | – |
| Switzerland | x | – | – |

[a]In Finland, the public health insurance system pays €15–20 per examination. In Norway, a few specific indications (uncertain foetal occiput position, bleeding in first trimester, assessment of residual urine volume, suspicion of gallbladder or aorta disease, suspicion of deep-vein thrombosis, evaluation of a subcutaneous process e.g. abscess) elicit a reimbursement of NOK109 (€11.44); ultrasound examination for other indications may generate a private fee. In Iceland the payment varies with the type of referral and time of the day, i.e. scanning during daytime hours elicits no extra payment, whereas patients seen after usual hours pay between ISK1200 (€8.66) and ISK7400 (€53.43) per examination. In the Netherlands, a general practitioner certified to perform ultrasound examinations earns €60 to €70 for an abdominal scan. Other examinations, e.g. musculoskeletal ultrasound scans have to be paid for by the patient. In Austria, some public insurance companies pay for ultrasound examinations and some do not, and the payment is variable, as is the case in Switzerland. In Germany there is variable payment by both private insurance and the public healthcare system—an overview of German prices can be obtained from DEGUM, which states that a basic ultrasound examination costs between €32 and €52.

**Table 2.** Main barriers to using ultrasound in general practice.[a]

| | Important | Not important | Not relevant |
|---|---|---|---|
| The ultrasound devices are expensive | 11/12 (92%) | | 1 (8%) |
| No/little payment for scanning | 11/12 (92%) | | 1 (8%) |
| Lack of time for scanning | 12/12 (100%) | | |
| Lack of training in the use of ultrasound | 12/12 (100%) | | |
| Other | 7/12 (58%)[b] | 1/12 (8%)[c] | 3 (25%) |

[a]The percentage of responses out of 12 countries/regions is reported.
[b]Other issues that were noted as important by different respondents were a lack of evidence regarding diagnostics, patient care, and healthcare costs. Scepticism in the medical community was also described as a major barrier, as well as resistance from radiologists. Lack of training and integration in the curriculum for general practitioners were other obstacles pointed to by several respondents. Support from the regional health authorities was also listed as an important issue.
[c]As a less important aspect a generation gap was mentioned, i.e. younger doctors are enthusiastic and older doctors reluctant.

to perform point-of-care ultrasound in general practice. Contrastingly, geographical challenges may be an important incentive/impetus for the use of ultrasound in rural areas (e.g. Greenland, parts of Finland, Iceland, Norway, Scotland and Sweden).[8] A paper from Norway described that having the prenatal ultrasound examination done in the local GP's surgery saved a woman from travelling 520 km to the nearest hospital.[9]

Traditions of medical societies may be important in relation to who performs the scanning. For example, in some countries women with gynaecological problems usually consult a gynaecologist (without referral) and in other countries their GP. In Germany, GPs learn ultrasound scanning during their specialist training, and there is little tradition for referring patients to a radiology ultrasound examination. In many other countries, the tradition is that radiologists perform all ultrasound scans. It is, however, important to notice the difference between point-of-care ultrasound and diagnostic ultrasound. The point-of-care ultrasound examination is done at the bedside by the clinician with a focused scope as part of the physical examination. In contrast, diagnostic ultrasound is typically done in the radiology department using high-end equipment as a very precise and thorough examination of an organ or anatomical region.

Even in countries with a similar general practice structure to Denmark, the Netherlands and Norway, there are significant differences in the implementation of point-of-care ultrasound in general practice. Hence, other aspects, e.g. geography, tradition, political and financial priorities, as well as interest in using point-of-care ultrasound in the general practice community may also be important. As the use of point-of-care ultrasound is increasing so are the associated challenges, e.g. in relation to education and training, time use, quality issues and cost–benefit for society.[10] Research into these aspects as well as international cooperation may aid the national societies and decision makers in meeting the challenges in relation to further implementing point-of-care ultrasound in general practice.

## Conclusion

There seem to be significant differences regarding the use and organizational aspect of point-of-care ultrasound in general practice across countries. Lack of time and training as well as financial aspects were considered important barriers to the use of point-of-care ultrasound in general practice. As the use of point-of-care ultrasound, in general practice increases so does the need for research and planning to guide it.

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## Declaration of interest

The authors declare no conflict of interest. The authors alone are responsible for the content and writing of the paper.

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