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**Point-of-care ultrasound (POCUS): An opportunity for radiologists to improve patient care?****1. Introduction**

Point-of-care ultrasonography (POCUS) has been defined as ultrasonography performed and interpreted by the clinician at the bedside [1]. The concept of a focused, goal-directed examination has been described as important in POCUS [1]. In addition, it has been postulated that clinicians from diverse specialties can become very adept at using ultrasonography to examine a particular organ, disease, or procedure that is directly relevant to their area of expertise, whereas radiologists typically perform more comprehensive examinations [1]. The number of ultrasonography applications performed by clinicians under the umbrella term POCUS is rapidly increasing [2]. POCUS encompasses many potential applications that are traditionally performed by radiologists, such as abdominal aortic aneurysm screening, deep venous thrombosis, rotator cuff tears, appendicitis, biliary colic, focused assessment with sonography for trauma, renal colic, scrotal pain, etc. [2]. With further technological advances in (portable) ultrasonography systems that make them cheaper and more widely available, and increasing experience among clinicians with ultrasonography, it is plausible that clinicians will be in the position to take over many more of the imaging tasks that have traditionally been covered by radiologists.

2. Turf battles

These ongoing developments in the field of ultrasonography may affect current radiology practice. In 2009, the European Society of Radiology (ESR) mentioned that turf battles between radiologists and clinical specialists affect all aspects of medical imaging, but that they seem especially acute with regard to ultrasonography [3]. In 2017, the American College of Radiology (ACR) performed a workforce survey to determine the views of Practice of Radiology Environment Database group leaders regarding management trends affecting them and to identify the areas in which these leaders need more help from the ACR [4]. Respondents identified POCUS as the area in which they need the most help [4]. Attempts have been made to set POCUS apart from other types of ultrasonography examinations, in terms of by whom, where, and with which machine it is done, indications for use, scope and comprehensiveness of the examination, image storage, and reporting. However, discriminating POCUS from other types of ultrasonography examinations may be irrelevant, because both the imaging modality (ultrasonography) and the main purpose (to assist in diagnosis and treatment planning) are the same. Segregating ultrasonography procedures performed by clinicians from those performed by radiologists may be regarded as a symptom of ongoing turf battles.

3. Position statements

In 2013, the ACR affirmed the utility of POCUS but also stressed the importance of training, credentialing, quality assurance, and documentation [5]. In 2020, the European Society of Pediatric Radiology (ESPR) issued a statement supporting POCUS by clinicians where good training and an accreditation and governance structure exists [6]. These statements emphasize the importance of quality assurance and quality control, but they can also be considered an important step to overcome the ongoing turf battles. However, they still leave individual radiology departments with an open question as how to practically deal with (the growing number of) ultrasonography examinations performed by clinicians in their hospital.

4. Ultrasonography by clinicians: inevitable and beneficial to patient care

In general, the workload of radiologists has increased considerably over the past decades, particularly due to the growth in the number of CT and MRI examinations that also consist of larger datasets, and decreasing reimbursements [7]. This workload keeps on rising in the foreseeable future. Given the recent literature on POCUS [1,2], the clinical demand for ultrasonography will also continue to rise. Ultrasonography has been regarded as an examination that consumes considerable human resources. Even when performed by a sonographer, the attending radiologist must be nearby, and “medical time” is costly [3]. It is an illusion to assume that radiologists will be able to cover all of these ultrasonography studies in a hospital by themselves around the clock in a timely manner. The increasing use of ultrasonography by clinicians should be regarded as an opportunity to mitigate workload for radiologists. Another advantage of a clinician performing the ultrasonography, is a rapid and targeted evaluation of the patient, directly in addition to history taking and physical examination. This reduces diagnostic delay, because of several reasons. First, there is no need for back and forth communication between the clinician and the radiologist. Second, radiologists (and supporting staff) are not always immediately available to perform an ultrasonography, particularly during busy duty hours. Third, there is no need to transfer a patient to an examination room in the radiology department, or to transfer an ultrasonography machine from the radiology department to the patient. Therefore, it seems both inevitable and beneficial to patient care to leave a proportion of these examinations in the hands of non-radiologists.

5. Cooperation and concertation

Cooperation and concertation between radiologists and clinicians can be considered the key to the clinical success of a widespread use of

POCUS in a hospital. The key question is which ultrasonography examinations should be performed by whom. The answer is what is best for the patient, in terms of available expertise and the time frame within which an ultrasonography should be performed. This depends on the available workforce of radiologists, and the number of clinicians who are able to perform and/or willing to learn ultrasonography for certain indications. Since these conditions are unique to each individual hospital, we believe work arrangements should be made between radiologists and clinicians on an individual hospital level, rather than having this arranged by a central body or authority on a regional, national, or international level. Once an agreement has been made on which ultrasonography examinations will be performed by radiologists and which by clinicians, and within which time slots (e.g. office hours vs. duty hours), both parties should stick to this agreement to ensure continuity in the quality of care in their hospital over time. Importantly, clinicians without sufficient expertise in performing and interpreting ultrasonography may make diagnostic errors and increase subsequent imaging utilization [8]. Therefore, as has also been stated by the ACR and ESPR [5,6], training and (re)accreditation in ultrasonography are essential. Radiologists should play a role in teaching how to perform those ultrasonography examinations that have been allocated to clinicians in their hospital, and the conditions (documentation, storage, quality assurance, and reimbursement) under which they should be performed. In a previous study by Zwank et al. [5], it was shown that such a cooperation and concertation between radiologists and clinicians is feasible.

6. Conclusion

Ultrasonography is a powerful tool to assist in diagnosis and treatment planning. The use of ultrasonography by clinicians is increasing and this is particularly accelerated by the concept of POCUS. More than 30 years ago, ultrasonography was already hyped as “the stethoscope of the future”. That future is now. Some conservative radiologists may be displeased and/or concerned about this reality. However, contemning POCUS and engaging into turf battles seems useless, because radiologists depend on requests from referring clinicians to perform ultrasonography, and not the other way around. In addition, the POCUS movement is growing, while the general workload of radiologists is already high and keeps on increasing. Acknowledging the value of ultrasonography performed by clinicians, and establishing a cooperation and concertation between radiologists and clinicians regarding the use of ultrasonography at the individual hospital level, taking into account each other's strengths and limitations, will improve patient care.

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IRB statement

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Declaration of Competing Interest

The authors declare that there are no conflicts of interest.

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References

- [1] C.L. Moore, J.A. Copel, Point-of-care ultrasonography, *N. Engl. J. Med.* 364 (2011) 749–757.
- [2] M.J. Arnold, C.E. Jonas, R.E. Carter, Point-of-Care ultrasonography, *Am. Fam. Physician* 101 (2020) 275–285.
- [3] ESR Executive Council 2009, European Society of Radiology, ESR position paper on ultrasound, *Insights Imaging* 1 (2010) 27–29.
- [4] J.A. Harolds, E.I. Bluth, The 2017 ACR workforce survey: management trends and strategic needs, *J. Am. Coll. Radiol.* 15 (2018) 475–478.
- [5] M.D. Zwank, B.D. Gordon, S.M. Truman, Refining the wild west of point-of-care ultrasound at an academic community hospital, *J. Am. Coll. Radiol.* 14 (2017) 1574–1577.
- [6] R.R. van Rijn RR, S. Stafrace, O.J. Arthurs, K. Rosendahl, European Society of Paediatric Radiology, Non-radiologist-performed point-of-care ultrasonography in paediatrics - European Society of Paediatric Radiology position paper, *Pediatr. Radiol.* 51 (2021) 161–167.
- [7] R.J. McDonald, K.M. Schwartz, L.J. Eckel, et al., The effects of changes in utilization and technological advancements of cross-sectional imaging on radiologist workload, *Acad. Radiol.* 22 (2015) 1191–1198.
- [8] J.L. Jacoby, D. Kasarda, S. Melanson, J. Patterson, M. Heller, Short- and long-term effects of emergency medicine sonography on formal sonography use: a decade of experience, *J. Ultrasound Med.* 25 (2006) 233–236.

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