

# Editorial “Minute Zero: an essential assessment in peri-operative ultrasound for anaesthesia”

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I have attentively read the article “Minute Zero: an essential assessment in peri-operative ultrasound for anaesthesia” by Elena Segura-Grau *et al.* [1]. The authors have suggested using point-of-care ultrasonography (POCUS) as part of a comprehensive anaesthetic assessment in the perioperative period. Such an extension of the standard perioperative examination aimed at searching for pathologies that may affect the intra- and postoperative course performed by an anaesthesiologist seems fully justified and may have a significant impact on treatment outcomes [2]. In the “Minute Zero” model, the authors have suggested that POCUS assessment of anaesthetised patients should be carried out twice – on admission to the operating theatre and before transfer to the postoperative ward. The described scheme is based on the well-known eFAST, FATE and BLUE protocols (assessment to determine the presence of free fluid in the body cavities, basic cardiac assessment, including IVC, and lung ultrasound assessment). The examination conducted in the manner specified by the authors provides a general but holistic picture of the patient, focused at detecting life-threatening pathologies. It is right to include a preoperative assessment of the filling of the stomach in the protocol, as the surface area of the pylorus found on ultrasound scans indicates the risk of aspiration during the induction of general anaesthesia [3, 4]. This may be of particular importance in patients undergoing emergency procedures, with gastrointestinal obstruction or in those with difficult contact (mainly children

and the elderly). In the algorithm described, the assessment of bladder filling in the postoperative period has been emphasised. This is a huge asset, which is often overlooked and, as the authors rightly point out, can cause postoperative delirium, especially in the elderly. The authors have developed an examination card that enables to document the examination in a simple and transparent manner based on markings of the appropriate blanks, which makes the protocol very friendly. The additional pros of the publication are the attached sample ultrasound images, which perfectly illustrate the ease of diagnosis of basic pathologies.

The authors have proposed to use ultrasonography in perioperative medicine. Expanding the physical examination by ultrasound assessment can give the anaesthesiologist many valuable suggestions regarding the optimal management of the patient or enables to diagnose him/her in cases of sudden cardiovascular and respiratory destabilization. Ultrasonography is one of the few diagnostic methods that can be used in the operating theatre setting without having to interrupt the surgery or transport the patient to the radiology department. In elective procedures, patients are usually prepared for anaesthesia and their cardiopulmonary efficiency is optimal; nevertheless in some of them, pre-anaesthesia ultrasound assessment can identify the pathological changes that may have a significant impact on the risk of intra- and postoperative complications [5]. In clinically asymptomatic patients, pathological changes can be found

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during e.g. transthoracic ultrasound. This mainly applies to interstitial lesions, particularly of an oedematous/congestive nature. Such changes are visible in lung ultrasound (LUS) as B-line artifacts (vertical, hyperechoic, comet tail artifacts arising from the pleural line, moving with it, always extending to the edge of the monitor regardless of the set depth of penetration of the ultrasound beam) [6, 7]. Finding such changes in the patient before anaesthesia may lead to changes in the strategy of perioperative fluid therapy or early use of inotropic drugs. In such patients, advanced hemodynamic monitoring can be considered to optimise treatment. A separate group of patients who may benefit from the POCUS assessment are patients undergoing emergency procedures in whom complete respiratory-cardiovascular assessment and preoperative preparation are not feasible. Ultrasound assessment performed by an anaesthetist, considering pathological lung changes, heart function and volaemia status, may be very important for individualisation of the patient's management. In the case of postoperative symptoms, e.g. respiratory failure, the basic ultrasound assessment of the thorax will enable the identification of the pathology or the exclusion of severe complications, such as pneumothorax, atelectasis or pleural haemorrhage.

The authors of the "Minute Zero" protocol have drawn attention mainly to two important moments of the anaesthesia procedure – the onset (induction) and completion. Ultrasonography can also be widely used during general anaesthesia and in postoperative care. One of the applications, the importance of which has increased significantly during the COVID-19 pandemic, is to confirm correct positioning of the endotracheal tube without the need to auscultate the lung fields. Another application is the identification of atelectasis and, if found, performing ultrasound-guided recruitment manoeuvres [4, 8, 9]. POCUS can be extremely useful for decisions about intraoperative fluid therapy (com-

bined assessment of the lungs, heart and inferior vena cava) [10–12]. Along with acquisition of skills, the advanced data from transthoracic echocardiography, and also from transoesophageal echocardiography, may be very helpful during perioperative management. In certain situations, the measurement of the optic nerve sheath diameter (ONSD) or transcranial Doppler ultrasound can be used.

Ultrasonography is an extremely useful tool in the hands of anaesthesiologists. An important problem may be the lack of an adequate number of educational centres and the lack of guidelines of scientific societies regarding the use of this diagnostic method. In the PubMed database, only the guidelines of the Canadian Society of Anesthesiology regarding the implementation of "basic POCUS" (bPOCUS) in perioperative medicine, published in 2021, were found [13]. It seems that the development of local recommendations for the use of point-of-care ultrasonography in the field of anaesthesiology and intensive care could increase the use of this method in everyday practice. An example of such a document is the Polish consensus on the use of lung ultrasound in COVID-19 patients treated in intensive care units [14].

I congratulate the authors of the "Minute Zero" protocol. Paying attention to the use of ultrasonography in perioperative medicine may be essential for popularising this valuable method of bedside imaging of anaesthetised patients.

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