information and should be the top pick of any regional specialist reading list.

**Specific** The most important general POCUS skill for anesthesiologists will arguably be the evaluation of gastric content and volume. Our top picks here would be ‘Validation of a mathematical model for ultrasound assessment of gastric volume by gastrointestinal examination’ which is a brilliant Randomized Controlled Trial (RCT) refining the idea of calculating gastric fluid volume by Perlas et al. We consider it an invaluable article providing easy to use formulas with practical implications for clinical decision making. The systematic review by Van de Putte et al. published in the British Journal of Anaesthesia: ‘Ultrasound assessment of gastric content and volume’ is a must read for everybody who wants to excel at this key POCUS skill. It presents a full understanding of the different formulas to calculate volume, while supplying all available evidence in a clear way.

POCUS of the airway is a fascinating aspect of the possibilities US offers us. Being able to quickly assess an esophageal intubation with the double track sign might be more helpful for the novice in airway management. However, the possibility to reliably identify the cricothyroid membrane even in morbid obese patients is immensely helpful for anesthesiologists. Kristensen et al. have published quite a few interesting papers regarding this topic.

Although lung US scanning might not be the most practiced skill for regional focused anesthesiologists, the ability to quickly assess (with high accuracy) a pneumothorax is invaluable, especially when performing infra and supraclavicular blocks. No Lung POCUS overview would be complete without mentioning the plethora of papers published by Daniel A Lichtenstein. His most influential papers revolved around the implementation of the so-called ‘BLUE protocol’ and respiratory failure. However it is ‘A Bedside Ultrasound Sign Ruling Out Pneumothorax in the Critically II’, as one of the first papers detailing lung sliding and analyzing the specificity and sensitivity of the US that really captures our heart. Incredibly this RCT was already published back in 1995 and has more than 500 citations.

Finally, a recent study with a catchy title: ‘Not so FAST - Chest ultrasound underdiagnoses traumatic pneumothorax’ would be our only pick in the less well studies category. It clearly shows the dangers of retrospective, monocenter studies presenting vastly conflicting results. Diagnostic accuracy studies should follow STARD guidelines, while in this publication only patients with confirmed pneumothorax were included in the study, instead of all patients with suspected pneumothorax. Furthermore, the study was performed by radiologists, not familiar with the specifics of trauma pneumothorax identification. They also incorporated it in the Focused assessment with sonography for trauma (FAST) exam, using a phased array or curvilinear probe which is not suitable for proper pneumothorax detection.

Although there are still many topics in POCUS left, like FAST, eFAST, volume status ascertainment, or even venous access to name but a few, it is well beyond the framework of our small overview to elaborate further.

**Conclusion** POCUS is here to stay and has become the gold standard as a diagnostic tool in only a few years. Ultrasound have become ubiquitous, making its routine use feasible. The dazzling number of possible applications can be daunting for the novice, however online training resources are readily available for everyone. Lack of teaching and training in standard curriculum remains a serious stumbling block.

**REFERENCES**


**SP19 RELEVANCE OF CUTANEOUS NERVE BLOCKS**

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In the case of regional anaesthesia for surgery in the awake patient, it is evident that every sensory nerve in the surgical field, including cutaneous nerves, must be anesthetised to obtain a satisfactory procedure. However, for postoperative analgesia, after general anaesthesia, selective nerve blocks of cutaneous nerves are less commonly performed or added to conventional nerve blocks in order to provide a more complete analgesia when needed. The lack of exhaustive knowledge of the neural anatomy, that still exists for certain areas of the human body, can be one explanation. The inability, logistically, to perform more nerve blocks or more complex nerve blocks could be another. Nevertheless, the notion that pain from cutaneous nerves is neglectable, and that wound infiltration by the surgeon would satisfactorily provide equal analgesia is not uncommon.

Scientific studies, comparing wound infiltration by the surgeon to any selective cutaneous nerve block, are absent. There are multiple studies comparing standard nerve blocks of mixed nerves to wound infiltration finding superior analgesia after nerve blocks. However, the relative importance of the cutaneous nerves cannot be extracted from these studies. Experiencing, not infrequently, the analgesic effect of providing cutaneous rescue blocks for failed surgical infiltration may also prove nothing more than improper infiltration technique. Nonetheless, if adequate anaesthesia of every cutaneous nerve ending in the surgical field by infiltration is regularly a challenging task, then this clinical reality should be the relevant comparator. Despite the lack of direct comparison between cutaneous nerve blocks and wound infiltration, the comparatively much longer effect of nerve blocks compared to infiltration could alone favour the former in many cases.
Pain from cutaneous nerves can be intense. This is more commonly experienced when the saphenous nerve is left unanaesthetised for ankle and foot surgery in spite of a functioning sciatic nerve block that innervates the vast tissue of the foot. It is experienced likewise when the sural nerve is unanaesthetised for ankle and foot surgery in spite of a functional sensory block of the lateral cutaneous nerve of the leg.

Regional anaesthesia of the cutaneous nerves of the superficial cervical plexus for medial clavicular fracture repair, or for shoulder surgery where the incision includes the skin and subcutaneous tissue, is particularly advantageous for postoperative pain, they are the most frequent cause of postoperative pain solely originating from cutaneous nerve branches. They can be easily observed. It is particularly recognizable when pain is resolved completely after the performance of a cutaneous nerve block postoperatively.

While cutaneous nerves have a part in mediating acute postoperative pain, they are the most frequent cause of postsurgical chronic neuropathic pain. The inescapable neurotoxicity of the surgical incisions, or the unintentional trauma by the surgical tools, consistently produce a procedure-dependent ratio of patients with chronic neuropathic symptoms such as disabling allodynia and hyperalgesia in the involved cutaneous areas. Historically, regional anaesthesia of the involved cutaneous nerves had only little relevance in the treatment of these chronic conditions. However, the increasing accessibility to non-neurodestructive technologies, such as percutaneous cryoneurolysis, in conjunction with improving point-of-care ultrasound equipment and the continuously ongoing scientific work into the anatomy of cutaneous nerves, changes this. Ultra-selective diagnostic nerve blocks of cutaneous nerve branches play an indispensable role in the treatment of these patients. Even in the absence of the ability to offer an interventional treatment, the diagnosis of cutaneous nerves as the cause of chronic pain has a significant potential to avoid improper secondary or tertiary surgical procedures when the pain is erroneously believed to have a different origin and a surgical solution.

The importance of cutaneous nerves in chronic postsurgical neuropathic pain should be of little dispute. Knowledge of the anatomy and ultrasonographic appearance of cutaneous nerves is essential to interventional treatments and help patients avoid unnecessary surgery. However, whether or not cutaneous nerve blocks should be of relevance to the regional anaesthetist in regard to acute postoperative pain, depends on the objective of the postoperative pain treatment. If future improvements towards opioid-free, painless, fast track procedures are an ambition, then cutaneous nerves and knowledge of cutaneous nerve blocks seem like an unavoidable part that equation.

REFERENCES

Cauda equina syndrome (CES) is a well-recognized and potentially serious, though rare, neurological complication of spinal anesthesia. It presumably results from injury to the sacral roots in the spinal canal, which can also cause bilateral radiculopathy and progressive neurological deficits in the legs.