

In summary, evidence suggests that single shot TAP blocks and Wound infiltration provide similar benefits in the more common surgeries. Although WI being seemingly more simple and technically easier to do, I recommend caution. USG TAP are most often performed by anesthesiologist who have trained in the technique, use state of the art ultrasound guidance and take time for proper injection in the correct site, while wound infiltration nowadays may lack of all this conditions: not being taught thoroughly, no injection site precision, no evidence on volume to be injected. But despite these fact, WI still manages to the job fairly well.

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#36984 PRO-CON – FASCIAL PLANE BLOCKS: ARE THEY EFFECTIVE?

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Introduction The gradual evolution of modern surgery with minimally invasive techniques and robotic surgery has diminished inflammation due to the precise dissections and tailored interventions making a profound change in pain control and management necessary. High thoracic epidural (HTEA), although providing excellent pain relief, is deemed as overshooting for most of these minimal impact techniques, especially because the HTEA has less than perfect safety profile. Rare but catastrophic complications like epidural hematomas and abscesses next to frequent hypotension and catheter failure all contributed to the diminishing role of epidural analgesia for lesser invasive surgery.^{1 2}Fascial plane blocks (FPBs) were developed more than a decade ago to fill in the locoregional anesthesia gap left by the disappearing HTEA.

Discussion Most of the FPBs were conceptualized around a single brilliant (although flawed as we will prove) idea that you could block multiple (spinal) nerves traveling within the planes between muscles by injecting high volumes of local anesthetics (LA). The ultrasound revolution aided this idea from concept to practical implementation. Publication pressure and ‘novel idea stress’ unfortunately have marred this whole enterprise. As increasingly more ‘new’ blocks were devised (some only with a needle tip 1 cm more lateral/medial) and elaborate names and acronyms were invented, shaking off the non-regionalists on the way. The fundamental questions of each of these blocks were often forgotten. We will address them point by point later on.

- Do they work clinically in specific settings (low abdominal/high/midline/lateral etc....)?
- Do we understand the exact working mechanism?
- Have we ruled out other working mechanisms?
- Have we adequately compared with other regional/non-regional pain methods?
- Do we know all the safety issues?

One of the basic problems with the FPBs is the lack of visceral pain coverage as the nerves they target are transmitting almost purely somatosensory input. Later conceived blocks moved their focus more posteriorly targeting nerves close to the paravertebral (by-proxy) space achieving a possible effect on the sympathetic chain. To date, we have not seen any definitive evidence that the erector spinae plane block (ESPB), Quadratus lumborum blocks (QLB) or any other has ever blocked visceral pain.^{3 4}

Do they work clinically in (ever-changing) specific settings?

While most of the transversus abdominis plane (TAP) block studies showed huge potential, recent literature is more mixed.^{5 6} This does not mean initial research was performed badly. There are several other reasons. Firstly, publication bias means negative studies get published much later. Secondly, surgical progress has evolved further with minimally invasive

techniques, smaller portholes, less instrumentation and lower insufflation pressure.⁷ Last but not least, the effect of somatic wall pain reduction is not so profound. Hype, hyperboles and an explosion of publications in the regional community made anesthetists blind to the fact they got carried away in enthusiasm.

Of course, there are exceptions and notably, because they are based on old tried and tested knowledge. The Rectus Sheath block (RSB) was described by Schleich for the first time in 1899!⁸ From a clinical standpoint we observe almost daily the extremely effective result of a bilaterally placed rectus sheath block. Again, there are several reasons for this and it aligns with our TAP theory. Firstly, the research results are balanced because it is an older technique. Secondly, the RSB is a technique designed for a midline incision. Nothing more, nothing less. Open surgery by definition has not evolved as dramatically as minimally invasive techniques. And finally, because open surgery has become a niche, there was never a publication explosion on the RSB, and the block was never overhyped.

Do we understand the exact working mechanism?

Unfortunately, we do not. We lack a basic understanding of the word 'fascia'. Despite a lot of basic research performed into micro- and ultrastructure of the nerves, membranes, fascia, fascial planes, and barriers surrounding the nerves, our understanding is limited at best.⁹ We would however recommend reading (almost all of) the works by Carla Stecco et al., who have done an unfathomable amount of work examining and studying the facets of fascia.^{10 11}

Fasciae are not open spaces where you can deposit LA which will then spread uniformly while anesthetizing all desired structures. In contrast, fasciae are complex structures, filled with fasciocytes secreting hyaluronan which influences movement and friction between layers. There are differences between the thickness of the fascial layers making the spread of LA unpredictable and inconsistent. In addition, fasciae have lines of fusion or fascial interconnectivity further hindering the spread of LA even towards unwanted areas. Movement, breathing, and position when placing the block might also impact the way your LA extends. And while these fascial layers are complex and largely unknown, there is one other glaring mistake. We should also remember that there is a huge variability in how the nerves exactly run in the fasciae. This could signal that even a good LA spread will not target the nerves in any predictive pattern.

The spread towards the paravertebral space has never been completely proven. There are some dye studies showing coloration near or in the paravertebral area, however, dye studies are not the same as real-life patients. Also, the viscosity of the methylene blue is different and the inconsistencies in different publications provide poor evidence. The intercostotransverse ligament(s) are extremely dense and thick structures and strong barriers for LA to penetrate.^{12 13}

Finally, ultrasound imaging, even though the progress has been huge, is just not accurate enough to distinguish fascia, fusion lines or nerves. All these factors point towards one big flashing warning sign: INCONSISTENCY.

Have we ruled out other working mechanisms?

Sadly, we have not. There is still a possibility that some of the FPBs provide multimodal analgesia via slow systemic

absorption of LA. A lot of research has shown that the systemic absorption rate of LA is quite high following FPBs.¹⁴ This does not mean that there is no direct neural target and that we have been fooled for years. There is a distinct possibility that all FPBs have a dual working mechanism. Partially targeting some of the (spinal) nerve fibers running within these fascial planes (but with inconsistencies because of the fascial layer nature) while also having a synergistic systemic effect.

FPBs placed postoperatively also seem to work better in our clinical experience. This may be due to the relatively short effect they produce. A placebo response of patients in pain in the postoperative anesthetic care unit cannot be ruled out either.

Have we adequately compared with other regional/non-regional pain methods?

As a community, we have failed. Although some randomized control trials were performed, most of the literature is filled with case series, case-reports, technical briefs, and cadaver dye studies. The few randomized control trials performed rarely compare FPBs to a previous standard of care (PVB or HTEA). Comparing intrathecal morphine to FPBs should also be encouraged as this 'old' technique shows a huge benefit for postoperative recovery.⁶

Most studies are small and single center. Blinding remains a problem throughout and even comparing two novel blocks is often flawed. A quick literature search identified eight ESPB versus QLB trials in recent years, both are considered candidates for paravertebral spread and visceral pain coverage. Four compared anterior QLB versus ESPB, published in low-impact journals.¹⁵⁻¹⁸ Two of them had serious problems with blinding, one had allocation problems and all were inconsistent with nomenclature and displayed muddled results. Clearly defined patient-centered endpoints should be formulated in future trials.¹⁹ More, bigger and multicentered research needs to be performed.

Do we know all the safety issues?

This is probably the only question that we can safely assume is reasonably answered. Most of the FPBs are considered superficial blocks and safe to use, even in anticoagulated patients.²⁰ Nevertheless, deep blocks remain as dangerous as most neuraxial blocks (e.g., lumbar spine arteries at the anterior QLB area) (figure 1). Therefore, the authors would advise, even in superficial blocks, caution and adding color doppler when performing a block (e.g., thoracoacromial artery in interpectoral and/or pectoroserratus blocks).²¹

Figure Picture from a trial subject. EudraCT identifier 2019-002304-4 Coppens et al. Trials. With kind permission by patient.

In addition, we still need to keep in mind that FPBs are volume-dependent blocks and local anesthetic systemic toxicity (LAST) is always a possibility. Numerous LAST case-reports have been published involving FPBs, especially in combination with other regional techniques or catheters using intermittent or continuous infusions.^{22,23} When injecting LA in fascial planes which are disrupted due to surgery one must also be extremely careful. Recent case reports after a terminated prospective trial should be a warning to all that FPBs' relative safety is not absolute.²⁴



Abstract #36984 Figure 1 Picture from trail subject. EudraCT identifier 2019-002304-4 Coppens et al. *Trials*. With kind permission by patient

Conclusion For most minimally invasive surgical procedures, simple infiltration of ports and multimodal analgesia suffices to produce excellent pain relief. FPBs are overhyped, only ‘relatively safe’, require specially trained anesthetists with high-end ultrasounds, and are unnecessary in most standard cases.²⁵ FPBs should be reserved for the occasional rescue blocks, chronic pain patients, or for a few select cases where surgical infiltration or even intrathecal morphine techniques are contra-indicated. It is frightening that despite a lack of decent research and knowledge these FPBs have become part of daily practice. For major surgery, neuraxial techniques are, in our humble opinion still the first choice.²⁶ For lesser invasive surgeries, intrathecal morphine could play a more prominent role in coming years.²⁷

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#36918

DO WE ALWAYS NEED AN ANAESTHESIOLOGIST IN OPERATING ROOM FOR MINOR SURGERY UNDER PERIPHERAL NERVE BLOCK? – YES

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Regional anaesthesia is well established as an integral part of perioperative care, providing excellent analgesia for a wide range of procedures. Advances in techniques including the