sensory and motor components. So PRF offers a potential treatment without the sequela of nerve distruction . However the literature is limited to case reports and case series and therefore data are limited to support durable efficacy.

The following table contains PRF targets beyond the use in spine:

Treatment of joint pain
Shoulder
Hip joint
Knee joint
Foot and Ankle
Treatment of head and neck pain
Trigeminal
Glossopharyngeal
Treatment of headache pain
Occipital
Atlantoaxial joint
C_2DRG
Sphenopalatine
Treatment of pelvic pain
Pudendal
Ganglion Impar
Treatment of peripheral nerves
Anterior cutaneous nerve (abdominal
Lateral femoral cutaneous nerve
Ilioinguinal-Iliohypogastric nerve
Brachial plexus
Median nerve
Lumbar sympathetic chain
Neurinoma Pain (stump pain, fantom pain)
Splachnic nerves
Stellate ganglion

In 2021 David W Lee et al published an article entitled:'Latest Evidence-Based Application for Radiofrequency Neurotomy (LEARN): Best Practice Guidelines from the American Society of Pain and Neuroscience (ASPN)'where the American Society of Pain and Neuroscience (ASPN) identified the need for formal evidence-based guidance. The authors formed a multidisciplinary work group tasked to examine the latest evidence-based medicine for the various applications of RFN, including cervical, thoracic, lumbar spine; posterior sacroiliac joint pain; hip and knee joints; and occipital neuralgia. Best practice guidelines, evidence and consensus grading were provided for each anatomical target. The consensus statement for other targets except spine was:

1. Genicular nerve radiofrequency neurotomy may be used for the treatment of knee osteoarthritis related and post-surgical knee joint pain. GRADE II-1 B.

2. Hip joint radiofrequency neurotomy targeting the obturator and femoral nerve branches may be used for the treatment of hip joint pain following diagnostic blocks. GRADE II-1 B.

3. Occipital neurotomy may be selectively offered for the treatment of occipital neuralgia pain when greater or lesser nerves have been identified as the etiology of pain via diagnostic blocevidenceks. GRADE II-2 C.

The use of radiofrequency ablation to treat pain is an established therapy that continues to evolve. This best practice document gives an evaluation as to the current evidence and recommendations. Going forward, these recommendations must be updated as new data is produced by either high-level studies or from large registries. Future guidelines will be modified as evidence is built, innovations arrive at the technology, and new ideas are presented to continue to improve patient safety and efficacy.

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SP64 IS THERE A FASCIAL ROLE IN PAIN SYNDROMES?

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Fascial anatomical structures have been and continue to be difficult to fully understand for more than 100 years. Important questions about fascial connections and movement of fascia predominate current research, particularly in relation to local anaesthetic spread and fascial block reliability. Scientific answers have yet to fully elucidate the intricacies of deep fascial planes and their connections, but some basic fascial understandings may guide future research and explain the potential for variable results from fascial blocks. The current knowledge about deep fascia, deep fascial planes and fascial blocks suggest four main areas to appreciate.

1. Fascia differs amongst body regions.

2. Fascia is a moveable anatomical structure that responds to muscle movement and body position.

3. Fascia is locally innervated, which, when exposed to local anaesthetic may change its intrinsic behaviours.

4. Variety may or may not be the 'spice of life' when it comes to fascial block access points.

A regional histological mapping of fascia would aid the prediction of the type of spread to be expected from various access points to deep fascia. An understanding of the propensity of fascial adhesions, and their detection, would also allow anaesthetists to better predict fascial block success. Knowledge of the various fascial blocks and their access points, combined with the understanding that each side of every patient is unique, may allow anaesthetists to be better prepared for variable success of a fascial block.

SP65 TIPS AND TRICKS TO PLACE AND MAINTAIN PERINEURAL CATHETERS AND AVOID COMPLICATIONS

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First, what are the complications, and how common are they?

When speaking about complications in regional anaesthesia many think about serious incidents, leading to severe morbidity and even mortality. Fortunately such complications are very rare. Examples are persistent nerve damage and local anaesthetic systemic toxicity (LAST). Given the small numbers of such complications, the many different nerve block catheters that could be placed, and the very different patient

factors involved in each case it is difficult to find any exact statistics on the subject. I think it is enough to know that those risks are small, only slightly larger than for the respective single-shot blocks.[1,2] The same is true for risks of bleeding, and thereby issues of coagulation deficits. Risks for wrong-sided blocks should also be comparable with single-shot blocks. The risk of infection due to a peripheral nerve block catheter is comparable to the infection risks for epidural catheters, only farther away from the neuraxis. The same sterility guidelines should be adhered to. Here I will instead focus on complication risks that completely differ from single-shot blocks and the epidural catheters.

Perhaps the most devastating of complications can happen when we insert a peripheral nerve catheter but it enters the spine through the intervertebral foramen and turns into an epidural catheter or even an intrathecal catheter without us knowing. This is definitely rare, but it has happened multiple times, for interscalene block[3], paravertebral blocks and for lumbar plexus blocks. Doing nerve block catheters in such areas you must know about this risk. Directing the needle towards the spine should be avoided, and threading the catheters extra distance inwards should mostly also be avoided.

When and where to inject the local anaesthetic?

Giving a large dose of local anaesthetic in the catheter when it is positioned and secured is a good routine to have, but divide the full dose in smaller aliquots over a few minutes. If the above situation has happened and we are getting an epidural or even intrathecal effect it is much better if it happens in the operation theatre or PACU than on the ward. Of course this also safeguard against the catheter tip having entered a vessel and causing a LAST reaction.

I even go a bit further in this thought, in that I recommend all colleagues to not give any local anaesthetic at all via the needle, except for skin infiltration via a smaller needle. Other than that I use only saline until I'm satisfied with the position of the catheter. The reason for this is the most common complication of all when it comes to continuous nerve blocks, namely that we cannot trust the catheter to work. Even if the needle tip was in the correct place the catheter might not end up correctly. Had I given the LA through the needle I would then still have good analgesia in OR and PACU, but the patient could get break-through pain on the ward 6–10 hours later. By only giving LA via the catheter I will know during surgery and in PACU whether the catheter will work or not. Then it's much quicker and easier to redo the catheter insertion, or time enough to switch to some other form of analgesia if that is deemed best. Predictability is key!

The catheter often stops functioning even if it was correctly placed from the beginning.[4] It could happen in 20–30% of the patients within the first 24–48 hours. However the numbers are difficult to interpret. Studies are with many different nerve blocks. Some measure the usage of rescue medication as an endpoint and take that as an indication for catheter failure which it might not be. Other only look at the spread of injectate around the nerves in volunteers. Few studies are done with comprehensive sensory and motor testing of the nerves that should be blocked by the catheter. Early catheter failures could of course be catheters that were incorrectly placed from the beginning. Later failures could be due to movements in the tissues causing the catheter to move internally, or poor fixation leads to movements at the level of skin penetration. Whatever the reasons and the numbers, most experts agree that catheters often do not function for as long as we would hope for. Some argue that perhaps the time of the nerve block catheter is over. With adjuvants such as dexmedetomidine and dexamethasone most single-shot blocks can be made to last for approximately 24 hours, and if needed the patient could return the next day for a similar block once more. On the other hand, there are institutions where continuous nerve blocks are working very well.[2]

My tips and tricks on peripheral nerve catheters

Choose wisely which catheters to actually place. One favourite could be the rectus sheath block where you can insert the catheter several centimeters extra, creating a large margin of error. Another good example would be the femoral nerve block. Holding the transducer transversally, and inserting the needle in-plane from lateral to medial you can puncture the skin quite laterally, pierce the fascia iliaca in the lateral part of the iliac muscle and then hydrodissect just beneath the fascia iliaca as you near the femoral nerve. Continue hydrodissecting until the needle tip is on the medial side of the femoral nerve. Then when you insert the catheter the margin of error is also quite large. If it is accidentally retracted a few cm it should perhaps be called a fascia iliaca catheter instead, but it would still block the femoral nerve.

Catheters in places where skin, muscles and nerves move in relation to one another are always more prone to displacement. Also plastic dressings, tapes and other securing devices often come off in such places. An example of that is the interscalene brachial plexus (ISB). Each time the patient moves his head there's a risk that the catheter moves. The same can be true for the popliteal sciatic block when the patient bends the knee. Inserting the popliteal catheter only a few centimeters more proximal than the usual single shot, or the interscalene catheter a few cm more caudal than the ISB single shot can lead to much more secure catheters. Theoretically the ISB catheter should then perhaps be called an upper trunk catheter instead, but the endpoint of analgesia to the shoulder would still be met.

For nerve block catheters to larger plexuses like the infraclavicular I do as with the femoral, ie I try to get into the plexus early in the passing of the needle and then hydrodissect as far as I can through the plexus before inserting the catheter. Then I get that margin of error. For blocks such as the popliteal sciatic or the adductor canal block I start visualizing the structures transversally, but before inserting the needle I rotate the transducer approximately 30–60 degrees and do the needling in-plane with the transducer. That makes round structures look oblong, but it is still quite easy to separate them from each other. If in doubt I can always switch between this oblique view of the nerve and the usual transverse view. This, I think, is easier than to change completely and do the block out-of-plane when I am used to do the respective single shot block in-plane. Inserting the catheter is said to be easier when doing the needling out-of-plane, but I believe I get almost the same angle to the nerve this way.

After inserting the catheter, rather a few centimeters too far than too short, I use ultrasound to verify that the catheter is in a correct place. It does not stay in the exact plane of the ultrasound beam, but combining minimalistic tuggings in the catheter with dynamic movements of the transducer to visualize the target and the surrounding tissue I can usually get clues as to where the catheter tip is located. Small test injections of saline can then be visualized by ultrasound, perhaps after bit by bit withdrawal of the catheter. It is not necessary to see the exact course of the catheter.

One easy way to start with peripheral nerve catheters is to let the surgeon insert them. In cases of amputations there

might be a large nerve that the orthopedic surgeon can insert the catheter into. I have used it both in midfemoral amputations (sciatic) and forequarter amputation (brachial plexus) with good effect (unpublished). Rectus sheath catheters and TAP block catheters have been described in the same manner.

Securing the catheter There are many specific catheter fixation devices on the market. I prefer using histoacrylic glue which both acts to hold the catheter fixated to the skin a few cm around the insertion site, and prevent leakage of fluid around the catheter. Over the glued catheter I put a plastic film and finally secure all loose catheter and the filter with ordinary tape. Tunneling the catheter is a method that is used by many to secure it better.

New needles and catheters

In later years there have been introduced a few catheters that are designed not to be inserted through a needle. (Examples include Pajunk E-Cath, B Braun Contiplex C and Ferrosan Certa Catheter) That means that they don't glide that easily in and out of the point of skin insertion. Also the leakage is much reduced, altogether lowering the risk of catheter failure. Some have found these useful. Personally I have found that the technique of inserting these catheters is very different than the ordinary catheter through-the-needle approach that every anaesthetist is used to from epidurals. That difference would probably cause other problems instead, leading to more primary catheter failures, unless you do very many nerve blocks with those new catheter types and learn to master the technique.

Conclusion Nerve block catheters are tricky to master but can be effective.

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SP66 CHEMOTHERAPY INDUCED NEUROPATHIC PAIN. CLINICAL DIAGNOSIS AND TREATMENT

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Chemotherapy-induced peripheral neuropathy (CIPN) is a common complication in patients receiving chemotherapy and can be particularly painful. The pathogenesis of CIPN has not been completely understood, and strategies for CIPN prevention and treatment are still open problems for medicine. Approximately 50–90% of patients under chemotherapy are affected by CIPN and bear a high risk of chronicity (approx. 30–40%)[1] Pain due to oral-mucositis (OM) in head and neck cancer (HNC) patients receiving radiotherapy (RT)/chemoradiotherapy (CRT) can be nociceptive and/or neuropathic. Neuropathic pain (NP) often remains underdiagnosed and untreated.[2] There is significant heterogeneity among studies regarding the method for diagnosing peripheral neuropathy. Nerve conduction studies are the gold standard and should be performed in patients receiving platins and complaining of neuropathic symptoms post-treatment Diagnosis can be supported by patients' documentation of neurotoxic complaints and assessment of QoL, e.g., by using the European Organization for Research and Treatment of Cancer (EORTC), QoL Questionnaire-CIPN-twenty-item scale (QLQ-CIPN 20) . Pain Neurotoxicity Questionnaire and DN4 have been validated in Greek laguage and are usefull tools[3] [4] Pain is prevalent in patients with cancer and considerably undermines their quality of life, thereby making the development of a comprehensive pain management approach essential.

Approximately, 1/3 of cancer patients experience NP, usually mixed with nociceptive components, but also, as a single, autonomous entity it can be disease related or related to the acute or chronic effects of cancer treatment such as radiotherapy, chemotherapy, hormonal therapy, or one of the evolving approaches (e.g. immune therapies). Cancer treatments have become more effective; patients are living longer with cancer and there are more cancer survivors. However, side-effects (particularly neuropathy) have become more problematic. The key to the management of cancer-related neuropathy is a considered assessment, remembering not to miss the opportunity of reversing the cause of the pain with appropriate oncological management. According to the literature, 25%-60% of women treated for breast cancer, regardless of the stage, experience pain. Taxanes used in adjuvant therapy for breast cancer are neurotoxic, and thereby being a potential risk factor for persistent pain after breast cancer treatment (PPBCT) and sensory disturbances. The prevalence of neuropathic symptoms due to acute toxicity of oxaliplatin was estimated at 84.6%, whereas PN established after chemotherapy with platins was estimated at 74.9%. Specifically regarding pain, the reported prevalence of pain due to acute toxicity of oxaliplatin was estimated at 55.6%, whereas the reported prevalence of chronic peripheral neuropathic pain in PIPN(platin induced periferal neuropathy) was estimated at 49.2%.[5] Docetaxel as adjuvant treatment for breast cancer does not increase the risk of PPBCT, sensory disturbances in the surgical area or functional impairment, but increase the risk for peripheral sensory disturbances. Pain and other concomitant symptoms and side effects should be assessed with validated and reliable scales and questionnaires Young age, previous comorbidities (such as back pain, arthritis, arthrosis, and fibromyalgia), and combined treatment with axillary lymph node dissection, chemotherapy, and radiotherapy are risk factors for chronic neuropathic pain. Chemotherapy induced peripheral neuropathy (CIPN) has been widely reported in controlled and uncontrolled studies. On one hand, more patients experience the excellent outcomes of chemotherapy, with prolonged survival. On the other hand, increasing numbers of patients are unable to complete full treatment because of CIPN development. Long-term pain management is therefore a challenging treatment aspect for oncologists and pain specialists. Cancer survivors with severe pain should be seen by a pain specialist. Multidisciplinary rehabilitation and individualized pain management may improve quality of life in cancer survivors.

The intrinsic difficulties in performing randomized controlled trials in cancer patients, have traditionally justified the acceptance of drugs already known to be effective in benign neuropathic pain, for the management of malignancy- related neuropathic pain despite the lack of relevant high quality data. Review of available literature reveals that the management of Neuropathic Cancer Pain (NCP) and Chemotherapy