

Interventional pain management practices in Pakistan: The role of Physical Medicine and Rehabilitation (PMR)

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Abstract

Chronic pain represents a complex, multifaceted challenge that surpasses the prevalence of commonly encountered disorders such as diabetes mellitus and hypertension. This condition exerts a substantial burden on healthcare systems due to its pervasive impact. While pain interventions and procedures constitute a crucial facet, they alone do not constitute a comprehensive solution. Nevertheless, the strategic and precise application of these procedures by well-trained and proficient physicians offers patients a swift route to resuming their normal activities, sparing them from protracted reliance on medications. Within the realm of Physical Medicine and Rehabilitation (PM&R), Interventional Pain Management (IPM) adopts a multidisciplinary rehabilitative approach, addressing all dimensions of pain syndromes. This approach culminates in enhanced functional outcomes and an improved quality of life. This concise review underscores the significance of this integrated approach, shedding light on various pain procedures routinely employed for diagnostic and therapeutic purposes. Within this context, we briefly explore the application of ultrasound and C-arm guided procedures. In conclusion, this review underscores the imperative nature of embracing a multidimensional approach to pain management, essential for seamlessly incorporating interventional pain management techniques into the broader domain of rehabilitation medicine.

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Introduction

Pain is defined as 'an unpleasant sensory and emotional experience associated with or resembling that associated with, actual or potential tissue damage' is also known as 5th vital sign.¹ Chronic pain, a multidimensional issue exhibits a higher prevalence than commonly encountered disorders such as diabetes mellitus and hypertension, exacting a considerable toll on healthcare systems.² The National Uniform Claim Committee (NUCC), under the

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stewardship of the American Medical Association (AMA), defines Interventional pain management (IPM) as "the discipline of medicine devoted to the diagnosis and treatment of pain and related disorders by the application of interventional techniques in managing subacute, chronic, persistent, and intractable pain, independently or in conjunction with other modalities of treatments".² It's crucial to recognize that the sources of pain extend beyond the purely biological; numerous contextual, psychological, and sociocultural factors contribute to an individual's experience of pain. Therefore, an all-encompassing pain management approach grounded in the biopsychosocial model becomes essential. Contemporary trends tend to focus primarily on the biological aspect of pain, often resorting to one-time intervention that yield immediate but short-lived results, often overlooking the social and contextual factors.³ While pain interventions and procedures undoubtedly constitute an integral component of the comprehensive plan, they are just one facet of the larger picture. Equally vital are the social, emotional, and behavioural dimensions of pain management. The judicious and precise application of these procedures, overseen by well-trained and skilled physicians, empowers patients to swiftly reintegrate into their daily lives, obviating the need for prolonged reliance on medications.

Within the domain of 'IPM in Physical Medicine and Rehabilitation (PMR),' also known as 'interventional physiatry,' a distinctive approach prevails. Here, the management plan adopts a multidisciplinary rehabilitative approach that encompasses all facets of the pain syndrome, resulting in improved functional outcomes and an elevated quality of life. Residency training in PMR, mandated by the Accreditation Council for Graduate Medical Education (ACGME), now includes essential instruction in interventional pain procedures.⁵ Several PMR fellowship programmes in Pakistan have incorporated this training into their residencies. This underscores the importance that future PMR physicians are equipped with the knowledge and skills necessary to provide interventional pain services. Pain medicine as a specialty was introduced in Pakistan almost 4 decades back.⁴ Although access to therapies that offer relief from chronic pain remains limited, particularly in developing countries but the number of pain clinics, especially within the private

sector is on the rise with overall low access to comprehensive pain services.⁴ This mini-review aims to provide a concise overview of common IPM practices in Pakistan and the pivotal role of PMR in chronic pain management.

The IPM procedures are predominantly being done using landmark techniques or under ultrasound (US) or fluoroscope guidance. While US, being cost-effective and radiation-free, allows real-time and dynamic visualization of soft tissues and blood flow; Fluoroscopy offers distinct advantages, especially in spinal procedures. Herein, we shall briefly discuss some of the commonly performed pain procedures in various pain clinics across Pakistan under US and fluoroscopic guidance.

1. Ultrasound guided interventions

Ultrasound has become an invaluable tool for a wide range of medical procedures, particularly in the realm of pain management. These interventions extend to peripheral joint injections, with virtually any joint within the body being a viable target. However, the utility of ultrasound goes beyond mere procedure execution; it serves as a diagnostic aid, providing insights into the severity of conditions and the underlying pathologies. For instance, in case of carpal tunnel syndrome, US not only allows assessment of the cross-sectional area of the median nerve,

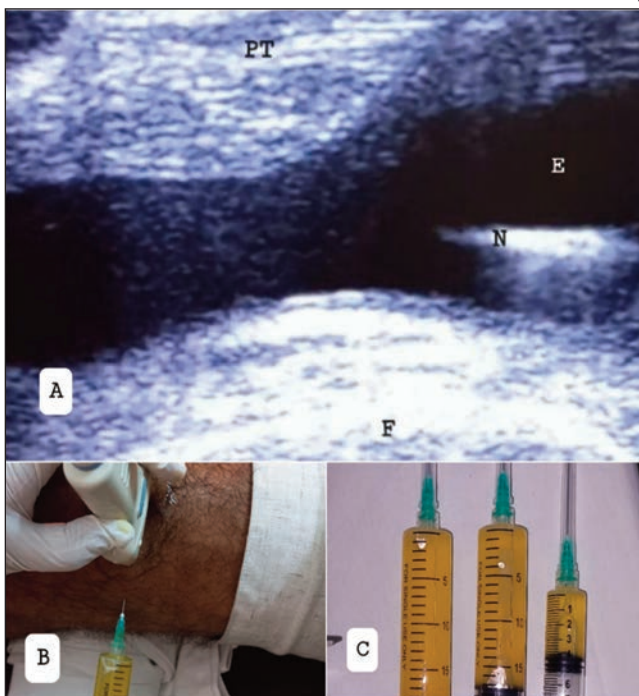


Figure-1: Ultrasound guided knee aspiration. A; US image of suprapatellar bursa of the knee with effusion and the needle seen inplane. B; In plane needle insertion with US probe in transverse axis. C; Aspirated fluid.

PT, Patellar tendon; F, Femur; E, Effusion; N, Needle.

offering insights into the severity of median nerve compression, but also enables to determine if the reason behind compression is a bifid median nerve or if there is an accessory muscle within the tunnel or synovitis. Some of the most commonly performed procedures are discussed below.

- **Intra-articular injections:** Intra articular injections or fluid aspirations done under US guidance reduce the risk of inadvertent damage to neurovascular structures and improve the efficacy⁶ (Figure-1). Most commonly targeted joints include gleno-humeral, elbow, wrist, hip, sacroiliac joint, knee and ankle joints. The choice of injectable solutions varies on the basis of underlying pathology and age group of the patient, ranging from corticosteroids, visco-supplementation, mesenchymal stem cells, platelet rich plasma (PRP) and ozone/dextrose prolotherapy, all of them have shown promising results when ultrasound is used for guidance.⁷
- **Soft tissue/bursal injections:** Precise localization is paramount for optimal accuracy in bursal injections. Bursa, often a thin, curved potential space, necessitates the use of ultrasound for accuracy. For example, the subacromial subdeltoid (SASD) bursa is a large but thin structure not more than 2 mm in thickness, making it a challenge by land mark guided technique. Therefore, US guidance is strongly recommended for accuracy and precision. The other bursal space scan also be easily accessed using US including iliopsoas bursa, ischial bursa, trochanteric bursa, medial gastrocnemius semimembranosus bursa (Baker or popliteal cyst).⁸
- **Peripheral nerve blocks/hydrodissection:** The peripheral nerves can be successfully targeted using US. It may include nerve blocks, hydro dissection of the entrapped nerves or radiofrequency ablation. The commonly and widely performed procedures include greater occipital nerve block for cervicogenic headache, occipital neuralgia or chronic migraine; medial branch block for afcetogenic pain, suprascapular nerve block in adhesive capsulitis and painful shoulder, intercostal nerve block to treat intercostal neuralgia or rib fracture pain, genicular nerve block to address knee and hip pain; and lateral femoral cutaneous nerve block to treat meralgia paresthetica. Similarly, US guided ilioinguinal and iliohypogastric nerve block to treat post herniorrhaphy pain has been reported

with better success rate and patient satisfaction and reduced complications than landmark guided blocks.⁹

- **Spinal procedures:** The safety and efficacy of spine injections has been discussed extensively in the literature. Stellate ganglion block is one of the widely performed procedure in pain clinics. Its location is critical as it is surrounded by incredibly important soft tissue and vascular structures in the lower cervical and upper thoracic region. Therefore, use of US guidance for such interventions is very important to avoid iatrogenic complications.

The success rate for cervical transforaminal injections/ selective nerve root blocks and facet joint injections is similar for fluoroscope or US guided procedures with less complications resulting from vessel puncture. Although fluoroscopy remains the most reliable method for axial procedures like lumbar transforaminal and caudal epidural injections, a few controlled studies have demonstrated similar/equivalent efficacy in improving pain and function compared to fluoroscopy.

2. Fluoroscope guided interventions:

Spinal or caudal epidural and other fluoroscopic guided injections are commonly used in treatment of axial and radicular back pain, coccydynia, sacroiliac, knee, hip and facet joint pain.

• Epidural injections:

These include transforaminal, intralaminar and caudal injections. Indications include radicular or axial acute/subacute pain, chronic pain that fails to respond to non-interventional nonsurgical measures, post lumbar surgery syndrome, spinal stenosis and intervertebral disc herniation/ radiculitis. The procedure is performed under fluoroscopy and site is confirmed by epidurogram before placement of injection. Transforaminal epidural injections are used for unilateral extremity pain with specific dermatomal distribution and is generally the ideal procedure for epidural injections. Caudal epidural injections are used in for post lumbar surgery syndrome and for midline axial back pain resulting from lower lumbar or sacral nerve roots. Re-evaluation and reconsideration of diagnosis should be sought if response is not satisfactory.¹¹

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• Radiofrequency genicular nerve ablation for chronic knee pain

Knee pain affects 250 million people worldwide, and is expected to increase as the population ages and knee pain from osteoarthritis (OA) becomes more common.¹² A relatively novel option for chronic pain management is radiofrequency ablation (RFA) of the genicular nerves (GNRFA). GNRFA appears to be safe, minimally invasive and is effective for treating intractable knee pain. The procedure is reserved for patients with symptomatic knee OA who do not respond to conservative treatment, failure of surgery and for those unfit for surgery due to comorbidities.¹² It provides short-term (3 to 6-month) and sometimes longer, pain relief in patients. In our practice, we perform it under fluoroscopic guidance with identification of landmarks and visibility of needle depth. We use a 100 mm needle at 80°C for 90 sec after confirming with a prior diagnostic block. We found that significant improvement in pain and human functional ability measured on WOMAC Scores was achieved even in patients with grade III or IV of knee OA according to KL classification.¹³

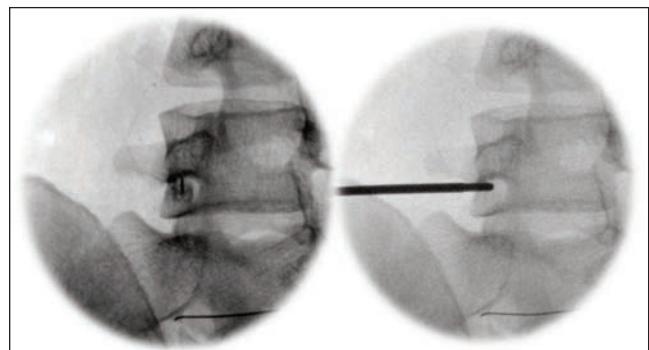


Figure-2: Needle placement for transforaminal L5 .

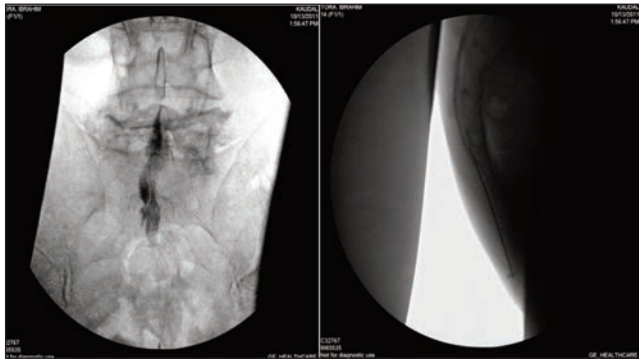


Figure-3: Ultrasound guided aspiration of suprapatellar bursa fluid.

• Facet joint injections

The prevalence of facet pain among chronic back pain is 15-40%.¹⁴ The condition is somewhat under diagnosed because facet joint (FJ) pathology can mimic spinal root compression. Diagnostic blocks are important for diagnosis of facet syndrome.¹⁴ Because of the dual nerve supply of FJs, at the same level and the level above, diagnostic blocks should be performed with a minimum of two levels to block a single joint. The ideal candidate for FJ denervation is a patient who demonstrates significant pain relief after diagnostic block. Cohen et al. showed a success rate of lumbar FJ radiofrequency (RF) denervation patients of 39% after a single block and 64% after a double block.¹⁵

• Sacroiliac joint injection

Sacroiliac joint pain accounts for 20-54% cases among patients of back pain. The diagnosis depends upon clinical examination, ruling out other causes of back pain and supportive diagnostic blocks. The condition can easily be confused with spinal stenosis or disc herniation.¹⁵ We perform therapeutic block after clinical and radiological examination and ask patient to continue with physical therapy after that.

Recommendations: With the goal of functional restoration in mind, we strongly advocate for the establishment of IPM as a subspecialty within PM&R in Pakistan, to be termed "interventional physiatry" or "Interventional Rehabilitation Medicine" This specialized discipline will serve as a conduit for enhanced coordination and collaboration between

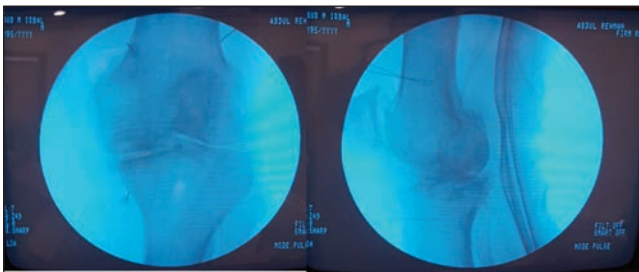


Figure-4: Ultrasound guided aspiration of suprapatellar bursa fluid.

interventional pain management procedures and comprehensive rehabilitation programmes. The result will be a synergy that not only improves patient outcomes but also elevates overall satisfaction with the care received.

Conclusion

Interventional pain management (IPM) undoubtedly occupies a pivotal role within the spectrum of a comprehensive pain management strategies. However, it is essential to underscore that IPM should not be viewed in isolation; rather, it complements a broader, multidimensional approach. Acknowledging the limitations of needle-based pain interventions is paramount, as is the proactive management of any potential complications that may arise during the course of treatment. Patient education stands as a linchpin in this process, ensuring individuals are well-informed about the potential outcomes of IPM procedures and the significance of functional restoration through ongoing rehabilitation programmes. In this context, physicians specializing in Physical Medicine and Rehabilitation (PM&R) are uniquely positioned to facilitate this educational process and guide patients towards regaining functionality.

In summary, emphasizing the critical importance of a multidimensional approach to pain management is paramount. Integrating interventional pain management techniques within the broader context of rehabilitation medicine is the path to optimizing patient care, enhancing functional outcomes, and ultimately elevating the overall quality of life for those grappling with chronic pain.

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