

## LETTER TO THE EDITOR

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### Intrathecal Therapy: The Burden of Being Positioned as a Salvage Therapy

Dear Editor,

In response to the editorial written by Drs. Harden, Argoff and Williams [1], similar calls for evidence for pain care therapies have been demanded before, spanning the breadth of our armamentarium, from oral opioids, to ultraminimally invasive surgeries, to epidural injections [2,3]. Of note, this exact same article was originally published in this same journal 2 years ago [4], accentuating the importance that the conclusions merit a response.

Historically, Intrathecal (IT) therapy has been plagued with positioning it as salvage therapy. Interestingly, however, despite this last-ditch position, success has been demonstrated by randomized controlled trials (RCT) focused on pain, employing ziconotide [5–7] and opioids for malignant and non-malignant pain [8]. A thorough systematic review was performed in 2011, utilizing the United States Preventative Services Task Force (USPSTF) criteria, demonstrated level II-3 evidence for non-cancer pain studies meeting a strict inclusion criteria with at least 12 month follow-up, and level II-2 evidence for cancer related pain with at least 3 month follow-up [9].

There is a lot of energy behind the clinical applicability of good, well-done, observational studies and randomized, placebo controlled trials. It is important to note that reliance on RCTs to provide evidence is not responsible medicine [10]. The highest level of evidence sometimes is not applicable in clinical practice. Patients' treatment must be individualized, and a lack of evidence should not obscure good clinical judgment. Restricting treatments to only those with the highest level of evidence compromises not only patient care, but also technological advancement and innovation [11].

Moving therapy away from salvage therapy improves outcomes, contrasting IT therapy to spinal cord stimulation (SCS). This point is shown in Kumar's work, which demonstrated that if a patient is implanted with a SCS system within 3 years following surgery, SCS has a success rate of greater than 80%. If that same patient is seen >12 years, with the same pathology, the patient has a success rate of less than 9% [12]. A landmark-randomized trial was presented at the North American Neuromodulation Society (NANS) Annual Meeting in December of 2014, demonstrating the worth of SCS to treat back and leg pain [13]. This paradigm can likely be transitioned to intrathecal therapies: earlier is better.

Inherent to IT therapy is the sheer number of variables to manage during its utilization: drug or drugs, concentration, catheter placement, infusion strategy used (continuous, bolus, patient activated bolus). Our pharmacokinetic knowledge of the IT space has dramatically improved with the work of Christopher Bernards, Tony Yaksh, and coworkers [14–17]. Guideline statements to reduce the interprovider variability of medications used, catheter position, and patient selection have unequivocally improved safety and care [18,19].

Standardization of the procedure, the decision-making regarding the choice of the medicine employed, and using an improved patient selection strategy will invariably continue to help outcomes. New and innovative infusion strategies have been proposed since the original call for evidence was published, awaiting higher powered study [20,21].

There is no question that randomized comparative studies need to be done looking at the benefit of IT therapy as compared to conservative therapy. One can make the same argument with the use of long-term systemic opioid treatments for chronic pain patients, as there is little to no evidence to support the popularity of the therapy [22]. Further, in an era of cost consciousness with health care delivery, the cost effectiveness of IT therapy has been demonstrated to be superior to conventional therapy, with the high start up costs to be returned within 28 months [23]. Additionally, opioid overdoses leading to death, from data collected by the Centers for Disease Control (CDC), was nearly 16,000 in 2009, and for every one overdose death, nearly 900 people took prescription painkillers for non-medical use [24,25]. As there is more physician control with IT delivered therapies, with regard to diversion and dosing, as compared to systemically delivered opioids, and with a more efficient dosing strategy, IT therapy clearly has a place in the pain care algorithm. However, the thought of it representing a treatment option for patients failing escalating doses of systemic opioid medications is a thing of the past.

More critically, however, is a change in how IT therapy is employed. A paradigm shift needs to occur to move it away from a salvage strategy, away from an indication when high dose systemic opioid therapies fail. Deer et al recently wrote an editorial on defining refractory pain, in an attempt to better place advanced therapies in the pain care algorithm [26]. We cannot lose sight of our patient-centric responsibility to provide access to

## Pope et al.

evidence-based (whether observational or randomized) care [27]. Clear evidence exists that there is an inherent risk, including death, of doing nothing to manage patients' pain, with the inherent goal of getting them more functional [28–31].

It is amazing that IT therapy has fared as well as it has, understanding that it is always thought of as the final straw. We agree we need better evidence, as can be said with many different treatments we offer, but our strategy needs to be more patient-centric.

## Author Disclosures

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## LETTER TO THE EDITOR

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