Evidence based interventional pain medicine

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• Based on practice guidelines written by Dutch and Flemish (Belgian) pain physicians

• Updated and edited by US/International pain physicians

• Sixty authors, experts in their field contributed

• Peer reviewed in two stages

• Published in Pain practice journal from August 2009 to Oct 2011
Grading of evidence

• Potential benefits Vs risks
  – 1 – Benefits outweigh risks
  – 2 – Benefits and risks are closely balanced

• Quality of evidence
  – A – Good quality RCT
  – B – RCTs with methodological limitations
  – C – Observational studies
  – 0 – Only case reports

• Positive (+) outcome or Negative (-) outcome
<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
<th>Implication</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 A+</td>
<td>Effectiveness demonstrated in various RCTs of good quality. The benefits clearly outweigh risk and burdens</td>
<td>Positive recommendation</td>
</tr>
<tr>
<td>1 B+</td>
<td>One RCT or more RCTs with methodological weaknesses, demonstrate effectiveness. The benefits clearly outweigh risk and burdens</td>
<td></td>
</tr>
<tr>
<td>2 B+</td>
<td>One or more RCTs with methodological weaknesses, demonstrate effectiveness. Benefits closely balanced with risk and burdens</td>
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<tr>
<td>2 B±</td>
<td>Multiple RCTs, with methodological weaknesses, yield contradictory results better or worse than the control treatment. Benefits closely balanced with risk and burdens, or uncertainty in the estimates of benefits, risk and burdens.</td>
<td>Considered, preferably study-related</td>
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<tr>
<td>2 C+</td>
<td>Effectiveness only demonstrated in observational studies. Given that there is no conclusive evidence of the effect, benefits closely balanced with risk and burdens</td>
<td></td>
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<tr>
<td>0</td>
<td>There is no literature or there are case reports available, but these are insufficient to prove effectiveness and/or safety. These treatments should only be applied in relation to studies.</td>
<td>Only study-related</td>
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<tr>
<td>2 C–</td>
<td>Observational studies indicate no or too short-lived effectiveness. Given that there is no positive clinical effect, the benefit</td>
<td>Negative recommendation</td>
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<tr>
<td>2 B–</td>
<td>One or more RCTs with methodological weaknesses, or large observational studies that do not indicate any superiority to the control treatment. Given that there is no positive clinical effect, risk and burdens outweigh the benefit</td>
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RCTs – Limitations in chronic pain

- Blinding patients / investigators

- Placebo-controlled trials – Patient inclusion

- Placebo effect 25-30% !!!!!

- High withdrawal rate

- Benefits !!!!
1. Trigeminal Neuralgia

• Unilateral pain in the distribution of trigeminal nerve

• Worst pain in the world

• Incidence 4-5/100,000

• Causes: Idiopathic, Tumors, Multiple sclerosis, Vascular loop

• Conservative: carbamazepine
Interventional treatments

• Surgical microvascular decompression (MVD)

• Stereotactic radiation therapy

• Percutaneous balloon compression

• Glycerol rhizolysis

• RF treatment of Gasserian ganglion

• Gasserian ganglion stimulation / neuromodulation
Trigeminal Neuralgia

- Radio-frequency ablation of Gasserian ganglion – 2B+ (Recommended)

- Pulsed Radio-frequency of Gasserian ganglion – 2B- (Negative recommendation)
2. Cluster Headache

• Characterized by unilateral headache associated with cranial autonomic symptoms

• Incidence 1:1000, Male > Female, 5:1

• Conservative management
  – Sumatriptan, Ergotamines and Verapamil
Cluster Headache

• Radio-frequency ablation of Sphenopalatine ganglion – 2C+ (To be considered)

• Occipital nerve stimulation – 2C+ (To be considered in specialised centers)
Figure 4. Radiofrequency treatment of the pterygopalatine ganglion: projection of the metal bar indicates the line over the fossa pterygopalatina.
3. Persistent idiopathic facial pain

- Pulsed Radio-frequency ablation of Sphenopalatine ganglion – 2C+ (To be considered)
4. Cervical Radicular pain

• Pain perceived in the arm

• Caused by irritation of cervical spinal nerve or its roots

• Most frequently involved level – C7

• Incidence 1:1000
Cervical Radicular pain

- Pulsed RF adjacent to Dorsal root ganglion (DRG) – 1B+ (Recommended)

- RF adjacent to DRG – 2B+ (Recommended)

- Interlaminar cervical epidural corticosteroid administration – 2B+ (Recommended)

- Transforaminal epidural corticosteroids – 2B- (Negative recommendation)

- Spinal cord stimulation – 0 (No studies)
5. Cervical facet pain

• More than 50% of patients with cervical pain may have facet related pain

• Unilateral pain with no radiation of pain beyond shoulder
Cervical facet pain

• Cervical Medial branch block of dorsal rami with local anaesthetic +/- corticosteroid – 2B+ (Recommended)

• RF ablation of cervical medial branch – 2C+ (To be considered)

• Intra-articular injections – 0 (No studies)
6. Cervicogenic headache

- Headache arising from cervical nociceptive structures
- Unilateral headache
- Prevalence 1%
Cervicogenic Headache

• Greater occipital nerve block with Local anaesthetic + corticosteroid – 1B+ (Recommended)

• RF ablation of medial branch of dorsal rami – 2B+- (To be considered)

• Injection of atlanto-axial joint with local anaesthetic + corticosteroid – 2C- (Negative recommendation)
7. Whiplash associated disorder

- RF treatment of cervical medial branch – 2B+ (Recommended)

- Botulinum toxin injection – 2B- (Negative recommendation)

- Intra-articular corticosteroid injection – 2C- (Negative recommendation)
8. Occipital Neuralgia

• Greater occipital nerve block with local anaesthetic + corticosteroid – 2C+

• Pulsed RF treatment of occipital nerve – 2C+

• Subcutaneous stimulation of occipital nerve – 2C+ (To be considered)

• Pulsed RF of cervical DRG – 0
9. Shoulder pain

- Prevalence of 35 per 1000
- More common in females
- Trauma, inflammation of the joint, rotator cuff syndrome
9. Shoulder pain

- LA + Corticosteroid injection of joint – 2B+/- (To be considered)

- Pulsed RF treatment of suprascapular nerve – 2C+ (To be considered)

- Cervical epidural infusion continuous – 2C+ (To be considered)
Table 2. Causes of Thoracic Radicular Pain

<table>
<thead>
<tr>
<th>Category</th>
<th>Causes</th>
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<tbody>
<tr>
<td>Neuralgia</td>
<td>• Intercostal neuralgia</td>
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<tr>
<td></td>
<td>• Neuralgia of the abdominal wall</td>
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<tr>
<td>Pain radiating from the spinal cord</td>
<td>• Osteoporosis</td>
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<td></td>
<td>• Vertebral collapse</td>
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<td></td>
<td>• Vertebral metastases</td>
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<tr>
<td>Scar pain</td>
<td>• Post-thoracotomy</td>
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<tr>
<td></td>
<td>• Postmastectomy</td>
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<tr>
<td></td>
<td>• Post-thoracoscopy</td>
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<tr>
<td></td>
<td>• Intercostobrachial neuralgia</td>
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<tr>
<td></td>
<td>• Postlobectomy</td>
</tr>
<tr>
<td></td>
<td>• Pfannenstiel incision</td>
</tr>
<tr>
<td>Rib pathology</td>
<td>• Fracture/pseudarthrosis</td>
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<tr>
<td></td>
<td>• Rib resection</td>
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</table>

10. Thoracic pain
10. Thoracic pain

- Pulsed RF / RF treatment of thoracic DRG – 2C+ (To be considered)

- Intercostal nerve block – 0 (Study related)
11. Lumbosacral radicular pain

- Spinal cord stimulation (FBSS only) – 2A+ (Recommended in specialised centers)

- Transforaminal epidural corticosteroid injection ‘Contained herniation’ - 2B+ (Recommended)

- Transforaminal epidural corticosteroid injection ‘extruded herniation’ – 2B- (Negative recommendation)
Lumbosacral radicular pain

- Pulsed RF adjacent to DRG – 2C+ (Recommended)
- Adhesiolysis – Epiduroscopy – 2B+- (To be considered in specialised centers)
- RF ablation of DRG – 2A- (Negative recommendation)
Lumbosacral radicular pain

“Red flags” ruled out

Yes

Conservative treatment was adequately carried out without conclusive results (VAS ≥ 4)

Yes

Subacute problem

(Transforaminal) epidural corticosteroid administration

Chronic problem

Confirm the suspected level by using a diagnostic block

Consider pulsed radiofrequency treatment adjacent to the ganglion spinale (DRG)

Insufficient result

SCS recommended for FBSS

Consider epiduroscopy/adhesiolysis in a study context in specialized centers
12. Lumbar facet joint pain

- RF ablation of medial branch of dorsal rami – 1B+ (Recommended)

- Intra-articular corticosteroid injection – 2B+-/ (to be considered)
Localized low back pain > 6 weeks in duration

Red flags ruled out

Yes

Tenderness overlying the facet joint(s)
Referral leg pain limited to above the knee except in rare circumstances;
Pain worsened with extension, flexion or rotation toward the ipsilateral side(s)

Indicative for facet complaints

Diagnostic block produces ≥ 50% pain reduction

Yes

Radiofrequency (RF) treatment of the rami mediales (medial branches) and L5 primary rami dorsales
13. Sacroiliac joint pain

- Intra-articular injection of local anaesthetic + corticosteroid – 1B+ (Recommended)

- Cooled RF of rami lateralis – 2B+ (Recommended)

- Pulsed RF / RF of dorsal rami and rami laterales – 2C+ (To be considered)
SI-joint pain

"Red flags" ruled out

Yes

Confirm SI-joint pain with diagnostic block

Positive

Consider intra-articular injections with corticosteroids

Insufficient result

Cooled/ (pulsed) RF L5-S3 rami dorsales

Negative

Reconsider diagnosis
14. Coccygodynia

- Local injection of local anaesthetic + corticosteroid – 2C+

- Intradiscal corticosteroid injection, Ganglion of Impar block, RF ablation, caudal epidural, Neurostimulation – 0 (Study related)
Figure 1. Algorithm for the treatment of coccygodynia.
15. Discogenic low back pain

- RF ablation of the gray rami communicans – 2B+ (Recommended)

- Intradiscal electrothermal therapy, RF treatment of the discus intervertebralis – 2B+/- (To be considered)

- Biacuplasty, Disctrode – 0 (Study related)
Low back pain – discogenic origin confirmed with CT or MRI

Conservative treatment and minimal invasive treatments (facet denervation and (Pulsed) Radiofrequency (P)RF-DRG) failed

Unsatisfactory result

Test block ramus communicans
> 50% pain reduction

Radiofrequency (RF) ramus communicans on two levels adjacent to the painful level

Figure 9. Practice algorithm for the interventional treatment of discogenic pain.
16. Complex regional pain syndrome (CRPS)

- Stellate ganglion block, Lumbar sympathetic block – 2B+ (Recommended)

- Spinal cord stimulation – 2B+ (Recommended in specialised centers)

- Brachial plexus block, Epidural infusion, peripheral nerve stimulation – 2C+ (To be considered)

- Intravenous regional block with Guanethidine – 2A- (Negative recommendation)
17. Herpes zoster and Post-herpetic neuralgia

• Interventional pain treatment of acute herpes zoster
  – Epidural corticosteroid injection – 2B+
  – Sympathetic nerve block – 2C+

• Treatment of PHN
  – Sympathetic nerve block – 2C+
  – Spinal cord stimulation – 2C+
  – Epidural corticosteroids – 0
  – Intrathecal injections - ?
Prevention of PHN

• Sympathetic nerve block – 2C+

• Repeated paravertebral injections – 2C+

• One time epidural corticosteroid injection – 2B-
18. Painful diabetic polyneuropathy

- Spinal cord stimulation – 2C+ (To be considered in specialised centers)
19. Carpel tunnel syndrome

• Local injections with corticosteroids – 1B+ (Recommended)

• Pulsed RF treatment of Median nerve – 0 (Study related)
20. Meralgia paresthetica

- Lateral cutaneous nerve of thigh infiltration with local anaesthetic +/- corticosteroid – 2C+

- Pulsed RF of the nerve – 0

- Spinal cord stimulation – 0
21. Phantom limb pain

- Pulsed RF of stump neuroma – 0
- Pulsed RF adjacent to DRG – 0
- Spinal cord stimulation – 0
22. Traumatic plexus lesion

- Spinal cord stimulation – 0
23. Cancer pain

- Intrathecal drug delivery – 2B+

- Epidural drug delivery – 2C+

- Unilateral oncological pain below the level of C5 dermatome
  Cordotomy – 2C+ (To be considered in specialised centers)

- Upper abdominal pain due to cancer of pancreas / stomach
  - Neurolytic coeliac plexus block – 2A+
  - Neurolytic splanchnic nerve blocks – 2B+
• Visceral pain due to pelvic tumors
  - Neurolytic hypogastric plexus block – 2C+ (Recommended)

• Spinal pain due to vertebral compression fracture
  – Vertebroplasty – 2B+
  – Kyphoplasty – 2B+
24. Chronic refractory angina

- Spinal cord stimulation – 2B+ (Recommended in specialised center)
25. Ischemic pain in the extremities

- Sympathectomy – 2B+/-

- Spinal cord stimulation – 2B+/-

- Raynaud’s phenomenon
  - Sympathectomy – 2C+
26. Chronic pancreatitis pain

- RF treatment of thoracic Splanchnic nerves – 2C+
  
- Spinal cord stimulation – 2C+
Conclusion

• Most of the pain interventions have reasonable good evidence to support

• Better patient selection improves the success

• Standardization of the technique is required to reduce risks with interventions
Thank you