

NHS England National Pathfinder Projects

Trauma Programme of Care Pathfinder Project – Low Back Pain and Radicular Pain

Report of the Clinical Group

National Pathway of Care for Low Back and Radicular Pain

17 December 2014

Summary

The NHS England Pathfinder Projects were established to address high value care pathways which cross commissioning and health care boundaries. Many conditions require a pathway of care which moves from the general practitioner through primary care and community services and into secondary care and sometimes specialised services. Difficulties in commissioning across boundaries, however, can cause artificial interruptions in what should be a seamless care pathway. The Pathfinder Projects are designed for all Stakeholders to work collaboratively to examine in depth these health care interfaces and to develop commissioning structures to commission care across the whole pathway. The Trauma Programme of Care Board selected low back pain and radicular pain as the Pathfinder Project. This is a high value care pathway in view of the very large number of patients involved.

Low back pain is extremely common and is the largest single cause of loss of disability adjusted life years, and the largest single cause of years lived with disability in England (Global Burden of Disease, 2013). In terms of disability adjusted life years lost per 100,000, low back pain is responsible for 2,313. By contrast the remainder of musculo-skeletal complaints counts for 911, depression 704 and diabetes 337. It should be borne in mind that this is principally occurring in people of working age, or with families.

UK specific data shows that LBP was top cause of years lived with disability in both 1990 and 2010 – with a 12% increase over this time. DALY loss between 1990 and 2010 has increased by 3.8% to 3,002/100,000 (95% CI 3,188 to 5,338). In other words 3% of the population's life is being lost to back pain. Total DALY loss from illness in 2010 was 27,163/100,000 (down from 31,842 in 1990). Thus back pain accounts for 11% of the entire disability burden from all diseases in the UK; furthermore the burden is increasing both absolutely (3.7% increase) and proportionally (7% to 8.5%).

In 2000 Manidakis & Grey estimated the cost of Back Pain to the NHS was £1.6 billion. In CG88 NICE estimated that these costs in 2008 had risen by approximately one third, to over £2.1 billion. The same analysis estimated that the societal cost of informal care and production loss was £10.7 billion in 1998. Overall, back pain is one of the most costly conditions for which an economic analysis has been carried out in the UK and this is in line with findings in other countries.

The pathfinder project has three goals.

1. To produce a generic pathway for the management of low back pain and radicular pain, from the general practitioner's surgery to specialised care, which is agreed by all Stakeholders.
2. To use this pathway of care as the basis for collaborative commissioning between CCGs, Area Teams and NHS England Specialised Services.
3. To construct a commissioning vehicle with specifications and any access policies which will permit introduction of new evidence in a straightforward way.

Following further discussions with all commissioners, public consultation may be held by the implementation groups.

The Pathway

The Clinical Group was formed with accredited representatives from each of the Stakeholders in the diagnosis and management of low back pain and radicular pain. Each stakeholder organisation was asked to nominate a representative to take part in the Clinical Group's deliberations. A list of the stakeholders and their representatives is included in appendix 1.

At the outset it was decided that the Clinical Group would be working with existing evidence and guidelines and would not itself be undertaking any evidence reviews. It was acknowledged that one of the objectives of the project was to provide a commissioning vehicle by which future advice could be

implemented in a simple and straight forward fashion. It is also the case that NICE are known to be updating the G88 guidance, and this was to involve both expansion of the scope and a further major evidence review. By constructing a pathway with specification and contracts on current evidence it would allow the implementation of the updated NICE guidance when published in about 2016. Professor David Haslam, Chair of NICE, has expressed his full support of this concept.

It is therefore important to note that this pathway, as any pathway, is subject to change in the future as new evidence becomes available. Changes may be indicated to the flowchart, or to recommendations within any of the boxes. Importantly, it is recognised that pathway will include patients with more chronic back pain who will enter the pathway at different times and at different points.

The pathway is entirely generic. No speciality or sub-speciality would be included as such, but rather the competencies and skills of the Health Care Professional at every stage would be identified and defined. The pathway is based on the needs of the patient at every point and on the structures of the services that might meet these needs. It was acknowledged that throughout England many different services and many different pathways of care exist and so implementation of the National Pathway would be a decision for the CCGs, taking into account services and provision within their commissioning area.

The triage and treat practitioner plays a core role in this pathway. This role could also be termed triage and management practitioner. This health practitioner is highly trained and has significant skills and competencies (appendix 2). The triage and treat practitioner provides the continuity of care which so many patients have expressed is lacking in many current systems. This practitioner will have a major role in triage including the identification and the investigation of radicular pain, the identification and management of emergency conditions such as cauda equina syndrome, urgent “red flags”, and the triage of inflammatory disorders. Explanations and advice will be based on CBT principals.

The pathway and guidance includes points of measurement at every stage with recommended PROMS and capacity for PCOMs (Appendix 3). This will facilitate impact assessment, audit of implementation and governance.

The final pathway has the agreement of all 30 stakeholder representatives. It is the product of many hours of hard work by all of the stakeholder representatives, whose knowledge was of an exceedingly high order and whose understanding was essential to the consensus that was built.

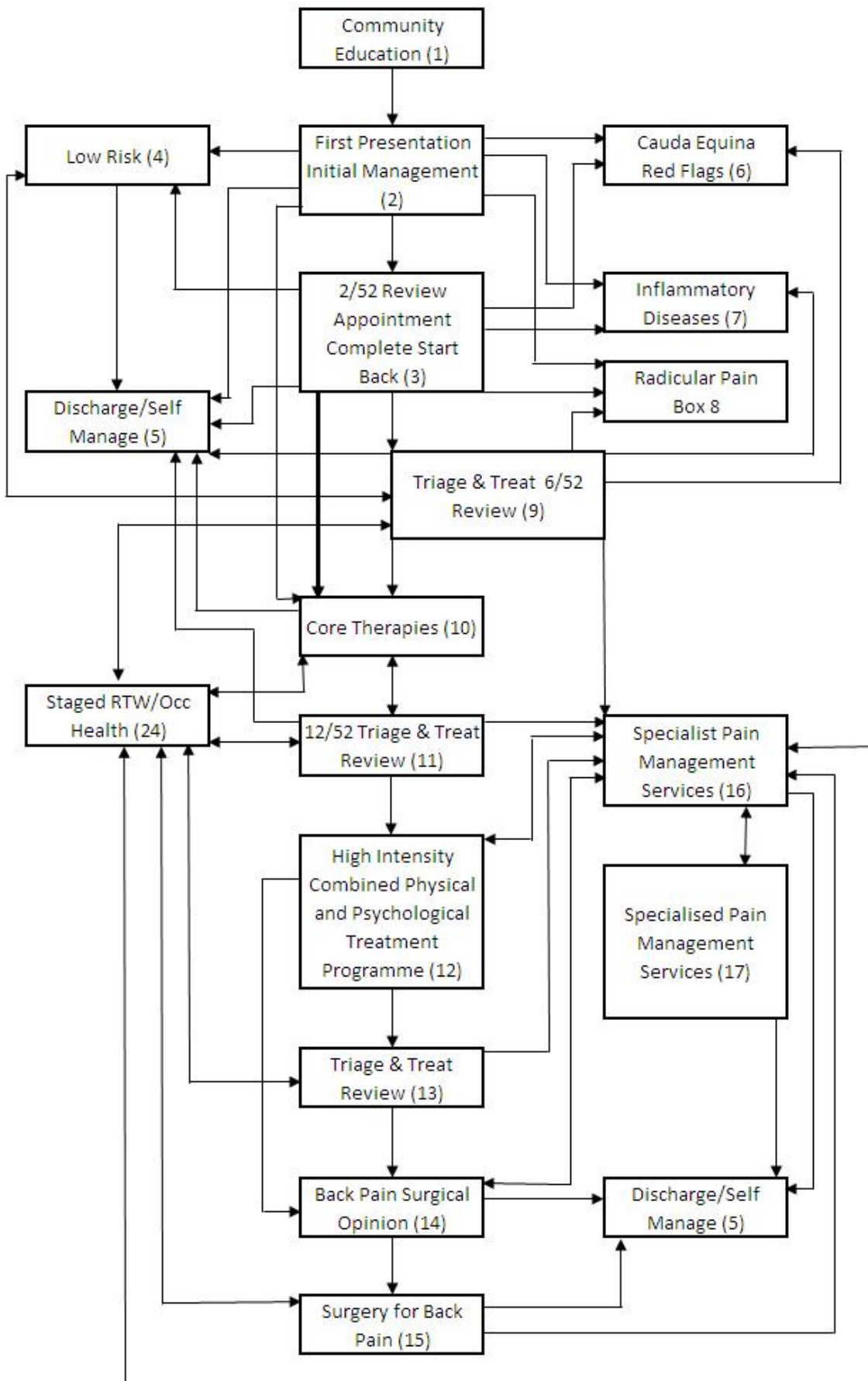
Reference

Murray CJL, Richards MA, Newton JN et al. UK Health Performance: findings of the Global Burden of Disease Study 2010. www.thelancet.com Vol 381:997-1020, March 23 2013.

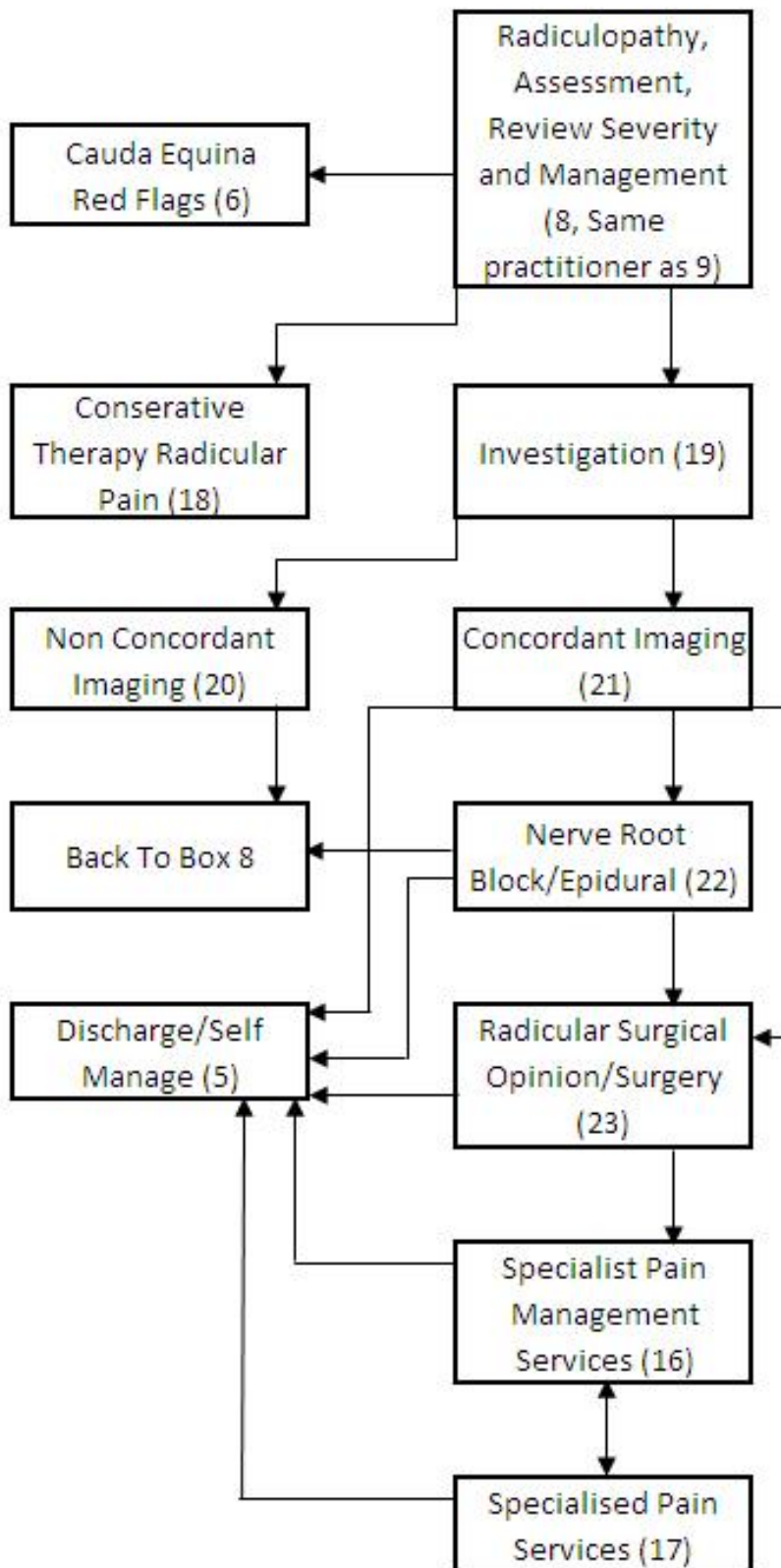
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Back Pain Pathway



Radicular Pathway



- Provision of time line.
 - Material in Public Domain
- Suggested Text

Low Back Pain

Most low back pain of sudden (acute) onset is not due to a serious disease or back problem although the exact cause of the pain is often not clear. This pain, which may vary from mild to severe, may be related to or triggered by a particular movement or action or it may be spontaneous. The back pain may also radiate into your buttock or leg/ legs. Most people will tend to suffer from back pain at some point in their lives and indeed it may recur. Most back pain usually improves sufficiently to resume normal activity within six weeks

For such pain, it is best to continue with normal activities as much as possible, although you may need to return to them in stages as the back steadily recovers. Getting back to work helps your recovery and employers will often arrange lighter duties to get you back sooner. Continuing with normal life as much as you can helps to take your mind off the pain and avoid you getting stiff and weak. Rest lying down, only when that's the only way to stop pain building up. Complete or prolonged bed rest is not advised at all as it is associated with delayed recovery.

To continue with normal activities, you may need simple analgesics (pain killers) for pain relief such as regular Paracetamol. If stronger pain relief is needed you can take Ibuprofen or codeine. Further advice should be sought from your local pharmacy and/or GP. This is especially if you are suffering from other medical conditions; asthma, gastrointestinal problems, taking other medications or pregnant. It is also important to keep within the daily dose and dosing frequency recommendations for Paracetamol and Ibuprofen and not wait for the pain to recur and become severe.

You should seek early advice from your GP if your low back pain does not respond to the measures described above, gets worse and certainly if it does not improve after six weeks. If you are on steroid medication, are at risk of osteoporosis or experience unsteadiness when you walk you should also contact your doctor.

Rarely, your back pain may be accompanied by the following:

- Difficulty passing or controlling urine, urinary incontinence
- Numbness/ loss of sensation around your back passage or genitals
- Numbness/loss of sensation, pins and needles, or weakness in one or both legs

Then you need to seek advice or attend A&E as soon as possible.

- Link to other source of advice
 - For further information, you may also refer to the following sources:
 - The Back Book
 - <http://www.arthritisresearchuk.org/arthritis-information/conditions/back-pain.aspx>
 - <http://www.backcare.org.uk/aboutbackpain>
- Evidence base and its level of evidence.
 - CG88 Low Back Pain: NICE guideline
 - Cochrane Reviews on low back pain:

Overview

Patients may present to a number of services complaining of back pain with or without leg pain. The possible services will depend on what is commissioned locally but may include:

- GP
- Self-referral to a Chiropractor, Osteopath or Physiotherapist
- 111 telephone service

Many GP surgeries are increasingly utilising telephone assessments (such as Doctor First or similar) as a first line management approach. The new 111 service in England explicitly utilises this approach by means of an assessment process within NHS Pathways linked to a detailed “Directory of Services” if a face to face assessment is considered appropriate. Physio Direct, a telephone assessment and advice service which began in 2001, may also be available locally,

- Provision of time line
 - From day of onset of symptoms to a number of days or weeks after the initial onset. Patients may present after experiencing their first ever episode of back pain and associated leg pain or may seek help after recurrent episodes.
- Definition of skills / competencies required
 - Essential competences
 - Clinical screening for serious pathologies: cauda equina syndrome, tumour, infection, major neurological deficit, osteoporotic collapse, inflammatory disease.
 - Diagnosing radicular pain, neurogenic claudication, spinal deformity and non-specific low-back pain
 - Identification of patients with good prognosis who can self manage.
 - Essential Skills
 - Clinical examination of the spine, surrounding structures and neurology for face to face contacts
 - Communication of diagnosis and prognosis
 - Shared decision making
 - Expectation management
 - Delivery of appropriate advice and sign posting
 - Essential Telephone Skills
 - Listening skills - Sensitivity to identify and manage emotion, Intuition to pick up unspoken cues, Evaluating the capability of the patient
 - Visualisation - Synthesis of auditory information to create a picture of the patients problem
 - Communication - Use of voice to reassure and inspire trust, Adapt tone of voice to match the situation, Delivery of clear information, Assertiveness to guide the interview
- Link to other source of advice
 - Community education and self-care(Box 1)
 - Low risk self-management (Box 4 & 5)
 - Red flags and cauda equina (Box 6)
 - Rheumatology (Box 7)
 - Triage Service (Box 9)
- Entry criteria
 - Patient with back and/or leg pain

- Exit Criteria
 - Concerning Red Flags or cauda equina Syndrome
 - Potential inflammatory disease
 - Non-spinal presentation
 - Choice: Self Management

- Essential referral information
 - Patient self referral

- Patient Assessment
 - Red Flags, including cauda equina Syndrome (see box 6)
 - STarT Back Tool (if appropriate facility)
 - Back pain history, management and outcome
 - Episode history and progress
 - Pain severity and % back and leg pain
 - Impact on family, social and work ability
 - Observation of spine, lower limbs, gait, pain behaviour for face to face contacts .
 - Neurological examination for face to face contacts

- Shared Decision Making / Patient Choice
 - Self management (Box 5) (likely low risk STarT Back scores)
 - Radicular Pain (Box 8)
 - Clinical review (Box 3)

- Interventions
 - Advice and information
 - Improvement is likely
 - Stay active including work
 - Pharmacy advice available
 - Fit note
 - Indications for early clinical review and emergency attendance

- Measurement point for quality standard and outcome, PROMS.
 - % completion of STarT Back
 - Reporting of number of missed tumours and cauda equina syndrome, infection, fracture.
 - Appropriate early identification and management of radiculopathy. Review and investigation of cases of delayed referral.
 - Re-consultation rates for simple back pain.

- Self Management
 - Patient information (Box 1)
 - GP or over the counter medication
 - Self directed exercise programme
 - Self directed relaxation techniques
 - Self directed return to normal social and activities

- Co-morbidity
 - Cardiac
 - Diabetes
 - Mental Health
 - Musculoskeletal (other than back pain)
 - Obesity
 - Neurological
 - Respiratory

- Definition satisfactory result
 - Patient reported improvement
 - Patient choice to self manage

- Evidence base and its level of evidence.
 - CG88 Low Back Pain: NICE guideline
 - Royal College of General Practitioners curriculum 2010 revised 14th August 2013: Statement 3.20 Care of people with Musculoskeletal problems.
 - Cochrane Reviews on low back pain:
 - Non steroidal anti- inflammatory drugs
 - Red flags to screen for malignancy
 - Multidisciplinary biopsychosocial rehabilitation for subacute low back pain among working age adults
 - Advice to rest in bed versus advice to stay active for acute low back pain
 - Internationally clinical guidelines consistently recommend early clinical assessment including screening of red flags.
 - <http://www.productiveprimarycare.co.uk/doctor-first.aspx> accessed 19 Mar 14
 - <http://www.connectingforhealth.nhs.uk/systemsandservices/pathways> accessed 19 Mar 14
 - Foster et al. Effect of Stratified Care for Low Back Pain in Family Practice (IMPACT Back): A Prospective Population-Based Sequential Comparison. *Annals of Family Medicine* 2014, 12(12): 102-111
 - Whitehurst et al. Exploring the cost-utility of stratified primary care management for low back pain compared with current best practice within risk-defined subgroups. *Annals of the Rheumatic Diseases* 2012, 71(11), 1796-1802
 - Hill et al. Comparison of stratified primary care management for low back pain with current best practice (STarT Back): a randomised controlled trial. *Lancet* 2011, 378: 1560-71
 - European Commission (EC), Cost Action B13 Management Committee (2004) European Guidelines for the management of acute low back pain. Available from: <http://www.backpaineurope.org>
 - Salisbury C, Montgomery A, Hollinghurst S, Hopper C, Bishop A, Franchini A., Kaur S, Coast J, Hall J, Grove S, Foster N 2013. Effectiveness of PhysioDirect telephone assessment and advice services for patients with musculoskeletal problems: pragmatic randomised controlled trial OPEN ACCESS *BMJ* 2013;346:f43 doi: 10.1136/bmj.f43 (Published 29 January 2013)

Overview

Early clinical triage is likely to be done by a primary care clinician such as a GP, Chiropractor, Osteopath or Physiotherapist. The clinician will reflect what is commissioned locally. Important functions of early clinical triage are; early identification of emergency and urgent presentations, early identification of severe radicular pain and optimisation of pain control.

- Provision of time line.
 - No later than 2 weeks from initial presentation
- Definition of skills / competencies required
 - Essential competences
 - Good communication skills
 - Clinical screening for serious pathologies: cauda equina syndrome, tumour, infection, major neurological deficit, osteoporotic collapse, inflammatory disease.
 - Referring emergency symptoms suggestive of cord or cauda equina compromise.
 - Diagnosing radicular pain, neurogenic claudication, spinal deformity and non-specific low-back pain
 - Assessment of severity of symptoms – tolerable/non-tolerable.
 - Advise patients on the appropriate use of pain relief and pain-modifying medications and other pain management strategies.
 - Assess and advise patients on the appropriateness of remaining in work.
 - Identification of patients with good prognosis who can self manage.
 - Essential Skills: Ability to:
 - Undertake a bio-psychosocial assessment of the patient
 - clinical examination of the spine
 - lower limb neurological examination
 - assessment of weakness and long-tract signs
 - Identify psychosocial obstacles (yellow flags) to recovery (including prognostic screening using STarT Back Tool).
 - Identify co-morbidities
 - Identify and refer “red flag” pathologies
 - Advise patients with radicular pain, about the signs and symptoms of a developing Cauda Equina Syndrome and what actions that they should take (medical emergency).
 - Communicate diagnosis and prognosis
 - Undertake a pharmacology review and prescribe pain relief.
 - Issue fit notes and liaise with the employer as necessary.
 - Apply the principles of shared decision making
 - Identify and manage expectations.
- Link to other source of advice
 - Community support (Box 1)
 - Bone Biology/osteoporosis service
 - Rheumatology service
 - Spinal on-call service
 - Triage Service (Box 9)
 - Occupational health
- Entry criteria
 - Symptoms or signs of lumbar origin present for > 2 weeks

- Exit Criteria
 - Concerning Red Flags or cauda equina Syndrome
 - Potential inflammatory disease
 - Non-spinal presentation

- Essential referral information
 - Medical history and medication
 - Past history of back pain
 - Current pain pharmacology
 - Social and work impact

- Patient Assessment
 - Red Flags, including cauda equina Syndrome (see box 6)
 - STarT Back Tool (if not already done)
 - Patient completed body chart
 - Back pain history, management and outcome
 - Episode history and progress
 - Pain severity and % back and leg pain
 - Impact on family, social and work ability
 - Understanding of patients objectives
 - Observation of spine, lower limbs, gait, pain behaviour.
 - Neurological examination

- Shared Decision Making / Patient Choice
 - Self management (Box 5) (likely low risk STarT Back scores)
 - Core therapies (Box 10) (likely medium or high risk STarT Back scores)
 - Radicular Pain (Box 8)
 - Clinical review (Box 9) (severe leg pain, diagnostic uncertainty, or high disability)

- Interventions
 - Psychologically informed advice and information.
 - Improvement is likely
 - Stay active including work
 - Pharmacy advice available
 - Fit note
 - Indications for early clinical review and emergency attendance

- Measurement point for quality standard and outcome, PROMS.
 - % completion of STarT Back
 - Reporting of number of missed tumours and cauda equina syndrome, infection, fracture

- Self Management
 - Patient information (Box 1)
 - GP or over the counter medication
 - Self directed exercise programme
 - Self directed relaxation techniques
 - Self directed return to work
 - Self directed return to normal social and leisure activities

- Co-morbidity
 - Co-morbidities should be identified and consideration given to how care may need to be modified. Patients should be referred or signposted appropriately.
 - Cardiac

- Diabetes
- Mental Health
- Musculoskeletal (other than back pain)
- Obesity
- Neurological
- Respiratory

- Definition satisfactory result
 - Patient reported improvement
 - Patient choice to self manage

- Evidence base and its level of evidence.
 - Internationally clinical guidelines consistently recommend early clinical assessment including screening of red flags.

Overview

Intervention for 'Low risk' patients is delivered by practitioner in Box 2 (First presentation-Initial management) or Box 3 (Review) following full assessment:

- Provision of time line.
 - At initial presentation or at first review
- Definition of skills / competencies required
 - Essential competences
 - Identification of patients with good prognosis who can self manage.
 - Essential Skills
 - Communication of diagnosis and prognosis
 - Prognostic screening using STarT Back Tool.
 - Shared decision making
 - Expectation management
- Link to other source of advice
 - Community support (Box 1)
- Entry criteria
 - No adverse social and psychological factors
 - Low risk on STarT Back tool
 - IF presentation is mechanical (non-specific) low back pain
 - AND assessing practitioner in agreement
- Exit Criteria
 - Choice: Self Management
- Essential referral information
 - Assessed by practitioner Box 2 or 3
- Patient Assessment
 - Assessed by practitioner Box 2 or 3
- Shared Decision Making / Patient Choice
 - Discharge / Self management (Box 5)
- Interventions
 - Advice and information
 - Improvement is likely
 - explanation of signs and symptoms
 - distinction between hurt and harm
 - appropriate reassurance about good prognosis
 - advice about regular adequate analgesia
 - Pharmacy advice available
 - advice about continuation of normal activities, including work, or return to normal activities using graded steady increases
 - Stay active including work
 - Simple patient information is provided by the AR UK leaflet or the Back Book.
 - Fit note
 - no onward referral necessary AND patient in agreement
 - advice to re-consult if symptoms fail to improve or worsen

- Indications for early clinical review and emergency attendance
 - discharge
- Measurement point for quality standard and outcome, PROMS.
 - Re-consultation rates for simple back pain.
- Self Management
 - Patient information (Box 1)
 - GP or over the counter medication
 - Self directed exercise programme
 - Self directed relaxation techniques
 - Self directed return to normal social and occupational activities
- Co-morbidity
 - Cardiac
 - Diabetes
 - Mental Health
 - Musculoskeletal (other than back pain)
 - Obesity
 - Neurological
 - Respiratory
- Definition satisfactory result
 - Patient reported improvement
 - Patient choice to self manage
 - Return to work and normal activities
- Evidence base and its level of evidence.
 - Foster et al. Effect of Stratified Care for Low Back Pain in Family Practice (IMPACT Back): A Prospective Population-Based Sequential Comparison. *Annals of Family Medicine* 2014, 12(12): 102-111
 - Whitehurst et al. Exploring the cost-utility of stratified primary care management for low back pain compared with current best practice within risk-defined subgroups. *Annals of the Rheumatic Diseases* 2012, 71(11), 1796-1802
 - Hill et al. Comparison of stratified primary care management for low back pain with current best practice (STarT Back): a randomised controlled trial. *Lancet* 2011, 378: 1560-71
 - European Commission (EC), Cost Action B13 Management Committee (2004) European Guidelines for the management of acute low back pain. Available from: <http://www.backpaineurope.org>

Box 5 - Discharge / self-management.

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- Patient information (Box 1)
- GP or over the counter medication
- Self directed exercise programme
- Self directed relaxation techniques
- Self directed return to normal social and occupational activities

Patient should re-consult if necessary.

Overview

The red flags were introduced in 1994 in the CSAG report. They comprise a number of symptoms and signs which have been associated with increased risk of underlying serious conditions. Recently some doubt has been cast on the sensitivity and specificity of the flags but they remain useful shorthand for clinicians to maintain awareness of possible serious pathology. Presence of a significant clinical suspicion of serious disease may lead to either:

- Emergency Spinal Referral
 - Suspected spinal cord neurology (gait disturbance, multilevel weakness in the legs and /or arms)
 - Impending Cauda Equina Syndrome (Acute urinary disturbance, altered perianal sensation, (reduced anal tone and squeeze – if circumstances permit)
 - Major motor radiculopathy
 - Suspected Spinal Infection

- Priority Spine imaging (Protocol led MRI whole spine unless contraindicated)
 - Past history of cancer *(new onset spinal pain)
 - Recent unexplained weight loss
 - Objectively unwell with spinal pain
 - Raised inflammatory markers (relative to range anticipated for age) Plasma viscosity , CRP , ESR (according to local practice)
 - Possible immunosuppression with new spinal pain (IVDU, HIV, Chemotherapy, Steroids).
 - Prolonged steroid use *
 - Known osteoporosis, with new severe spinal pain
 - Age <15, or >60 years new onset axial back pain

*Statistically significant red flags. Although the others listed may not be statistically significant these are the symptoms items which are commonly seen in serious pathology. The more of these present the greater the probability of serious underlying pathology

- Provision of Time lines
 - Emergency
 - Major neurological deficit / Major motor radiculopathy
 - Sphincter failure - incipient or established recent <48 hours
 - Sphincter failure Established > 48 hours
 - Spontaneous epidural haematoma
 - Ankylosing Spondylitis with new pain
 - Metastatic Spinal Cord Compression with Neuro Symptoms /signs
 - Spinal infection
 - Urgent
 - Osteoporotic Fracture with severe or significant pain at 8 weeks
 - Spinal metastases no neurological deficit

(See Red Flag Appendices 1, 2 and 3).

- Definition of skills / competencies required
 - Essential competencies
 - Clinical screening for serious pathologies: cauda equina syndrome, tumour, infection, major neurological deficit, osteoporotic collapse, inflammatory disease.
 - Essential Skills
 - Clinical examination of the spine and nervous system
 - Communication of diagnosis and prognosis
 - Shared decision making
 - Expectation management
- Link to other source of advice
 - Spinal on-call service (compliant with Service specification D14. The regional spinal network should ensure 24/7 access to MRI scanning for a suspected cauda equina or spinal cord compression (- same day for emergency referral and within one week for urgent referrals.). Spinal surgeons able to perform any necessary emergency surgical procedures must be available 24/7.
 - Immediate telephone access
 - “virtual clinic” meetings
 - MDT review meetings
 - Triage Service (Box 9)
 - MSCC Coordinator
- Entry criteria including necessary investigations / results
 - Red Flags for Cauda Equina Syndrome and/ or cord compression
 - History
 - Urinary retention / incontinence
 - Faecal incontinence
 - Altered perianal sensation
 - Limb weakness
 - Examination
 - Limb weakness
 - Generalised neurological deficit / gait disturbance
 - Hyper-reflexia, clonus, extensor plantar response
 - Saddle anaesthesia
 - Reduced anal tone / squeeze (if circumstances permit)
 - Urinary retention
 - Red Flags for suspicion of tumour / infection. History
 - Past history of cancer (all patients should have been given an alert card about MSCC following their initial presentation)
 - Unexplained weight loss
 - Other symptoms suggestive of malignancy
 - Unwell / Fever
 - Raised inflammatory markers ESR>50, PCV < 30
 - Age <10 years or Age >60 years
 - Pain - Thoracic or persisting non-mechanical
 - Possible immunosuppression – IVDU, HIV, Chemotherapy, Steroids.
- Exit Criteria
 - Red Flags excluded
- Essential referral information
 - Red Flags suspected

- Patient Assessment
 - History:
 - Episode history and progress
 - limb pain, weakness and sensory disturbance
 - bladder / bowel / sexual dysfunction, systemic symptoms,
 - In patients with neck and arm symptoms ask about clumsy hands and unsteady legs.
 - General medical history
 - Examination:
 - Observation of spine, lower limbs, gait, pain behaviour
 - limb pain, weakness and sensory disturbance
 - Neurological signs including upper motor neurone signs if suspicious of myelopathy.
 - Perform a perineal assessment (including perianal sensation , Anal tone and contraction , if circumstances permit)
 - Detailed full general medical examination (as indicated when symptoms suggest more significant underlying pathology)

- Shared Decision Making / Patient Choice
 - Spinal on-call service (compliant with Service specification D14)
 - Immediate telephone access
 - “virtual clinic” meetings
 - MDT review meetings
 - Triage Service (Box 9)
 - MSCC Coordinator

- Interventions
 - Emergency referral to Spinal Surgeon (same day). Emergency imaging.
 - Cauda Equina Syndrome: bladder / bowel dysfunction
 - Acute spinal cord compression: new/progressive widespread neurological deficit
 - Progressive limb weakness including major motor radiculopathy
 - Urgent referral to Spinal Surgeon (<2 weeks): - Priority Spine imaging (same day or according to local protocols)
 - Red Flags in the absence of neurological compromise
 - MRI - Whole spine imaging according to local agreements with Radiology services
 - Blood tests should be obtained (these would normally include FBC, biochemistry Inflammatory markers (PV, ESR,CRP according to local practice)
 - The result reviewed and the subsequent treatment plan defined by the requesting clinician within one week (c.f. with MSCC QSAC recommendations) or sooner if clinically indicated
 - Time to subsequent review / action being dependent on the imaging and test results.
 - Surgical Interventions include (see Red Flag appendix 4)
 - Cauda Equina Syndrome
 - Lumbar spinal decompression and discectomy. This is performed posteriorly and involves decompression of the nerves and removal of fragments of disc compressing the nerves.
 - For other conditions key interventions include:
 - Image guided biopsy (tumour and infection)
 - For tumour Neo-adjuvant chemotherapy

- Tumour Excision (see Red Flag appendix 4) - this may be : Extralesional , Marginal , Intralesional
- For Spinal Reconstruction (see Red Flag appendix 4) there are different routes and techniques to stabilise the spine. These may be used in varying combinations. These include:
 - Vertebroplasty – (kyphoplasty)
 - Pedicle screw stabilisation
 - Anterior spinal reconstruction
 - Combinations of the above
- Measurement point for quality standard and outcome, PROMS. (see Red Flag appendix 5)
 - Surgical complications
 - ODI
 - VAS back and leg
 - EQ-5D
- Self Management
 - This is not regarded as appropriate for this patient group.
- Co-morbidity
 - This has significant potential implication as many if not most of these conditions usually require surgical intervention and ASA Anaesthetic grading (and if below threshold (defined locally) anaesthetic assessment in the referring hospital is recommended prior to patient transfer to a surgical centre).
 - This should not delay urgent transfer if clinically required
- Definition satisfactory result. (see Red Flag appendix 5)
 - Surgical rate by Indication and reasons for non-intervention
 - Mortality - operative and 30 day
 - Rate of post –operative neurological deterioration
 - Rate of avoidable complications (Wound infection. Failure of construct or fusion)
 - Rate of re-operation
 - PROMS
- Evidence base and its level of evidence.
 - Red flags www.sheffieldbackpain.com/professional-resources/learning/in-detail/red-flags-in-back-pain
 - Organising quality and effective spinal services for patients DH Spinal Taskforce 2010 www.nationalspinaltaskforce.co.uk/
 - Commissioning Spinal Services - Getting the service back on track DH Spinal Taskforce 2013 www.nationalspinaltaskforce.co.uk/
 - NICE guideline CG75 MSCC (November 2008) <http://guidance.nice.org.uk/CG75/QuickRefGuide/pdf/English>
 - Acute Oncology Measures (March 2011) National Cancer Action Team http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_125889.pdf

- Provision of time line.
 - Consider medical pathology at each review where good outcomes not achieved
 - Inflammatory spinal disease (spondylitis / sacroiliitis) may not be evident on plain radiographs or standard MRI images of lumbosacral spine, particularly in early disease (e.g. < 5 years).
- Definition of skills / competencies required.
 - Essential Competencies
 - Diagnostic skills and management experience in inflammatory spinal disease and associated co-morbidities.
 - Requires a specialist multidisciplinary team typically including an accredited rheumatologist and physiotherapy.
- Link to other source of advice
- Entry criteria including necessary investigations / results
 - Diagnostic uncertainty with suspicion of medical pathology:
 - Pain disturbing sleep
 - Thoracolumbar or sacroiliac pain
 - Marked morning stiffness
 - Persisting limitation spinal movements in all directions
 - Peripheral joint involvement
 - Iritis, psoriasis, colitis, enthesopathies
 - Preceding infective diarrhoea or sexually transmitted infection
 - Family history of spondylitis
 - Investigations prior to specialist referral may typically include
 - Blood tests (acute phase response, e.g. C-reactive protein, Erythrocyte Sedimentation Rate, and tests to exclude other diagnoses (bone profile, immunoglobulins, etc.)).
 - HLA-B27 genotyping has little value in diagnosis. In the UK 5% of people with ankylosing spondylitis are HLA-B27 negative, <2% people who are HLA-B27 positive will ever develop inflammatory spinal disease, whereas 60% may have non-inflammatory spinal pain.
 - Imaging is determined by clinical presentation and may be deferred to the specialist team. In longstanding disease, spinal radiographs (e.g. lateral spine, sacroiliac views) may be diagnostic. However, for some years after symptom onset, plain radiographs may be normal. Standard T1 and T2 lumbosacral MRI images will typically omit the synovial component of sacroiliac joints and lacks the sensitivity of STIR imaging to detect inflammation. The presence of spondylotic changes does not exclude concurrent inflammatory spinal disease; disc disease is no less common in people with ankylosing spondylitis than in the normal population.
- Exit Criteria
 - Other medical conditions causing spinal pain include:
 - Discitis (infective or sterile)
 - Paget's disease of the bone
- Essential referral information
 - History of back pain episode
 - Information concerning entry criteria, including past or current history of peripheral joint involvement, iritis, psoriasis, colitis, family history of spondylitis
 - Current and previous treatments

- Patient Assessment
 - History for associated features as above, including infective and sexual history.
 - Examination to include assessment of spinal movement (not specific), sacroiliac stress tests, assessment of skin, joints and eyes, exclude associated features including interstitial lung disease and aortic valve pathology.
 - Assessment of previous treatments and symptom severity / impact (function, psychological: Bath Ankylosing Spondylitis Disease Activity Index (BASDI), Bath Ankylosing Spondylitis Functional Index, BASFI).
 - Investigations to confirm diagnosis. MRI with STIR sequences of affected regions of the spine is the most sensitive imaging method for detecting early disease where there is high clinical suspicion.

- Shared Decision Making / Patient Choice
 - Reinforce advice and discussion with written information (e.g. Arthritis Research UK patient information leaflets).
 - National Ankylosing Spondylitis Society (NASS); patient support group with local groups and activities.
 - All patients with inflammatory spinal disease should have access to a specialist multidisciplinary team (ARMA guidelines).

- Interventions
 - Medical: Non-steroidal anti-inflammatory agents with gastro-protection as appropriate. Simple analgesia where appropriate. NB NSAIDs more effective than long term opiates. Avoid glucocorticosteroids (high risk of osteoporosis and spinal fracture). Injections not of proven benefit. NB: people with high disease activity/impact despite adequate trials of 2 non-steroidal anti-inflammatory agents may be eligible for biologic therapy (TNF-alpha blockers) (NICE technology appraisal TA143).
 - Physiotherapy: Mobilisation and general aerobic exercise. Land or water-based group exercise. Balanced advice about contact sports, whilst minimising fear avoidance.
 - Mental health: Psychological distress less common/severe than in non-inflammatory spinal disease for same level of pain/disability, but may be important co-morbidity and barrier to recovery. Key issues common to other chronic, disabling, incurable diseases.

- Measurement point for quality standard and outcome, PROMS.
 - Ongoing specialist support indicated (ARMA guidelines).
 - Key PROMS: BASDI, BASFI.
 - Continuation of biological therapies depends on response (NICE guidelines). Time from symptom onset to diagnosis currently averages 7 years. The hypothesis that early diagnosis/treatment leads to better outcomes is currently under research investigation, although ethical arguments support earlier diagnosis.

- Self Management
 - Daily exercises, medications, pain management.

- Co-morbidity
 - Peripheral arthropathy: requires treatment according to inflammatory disease guidelines. NB disease modifying anti-rheumatic drugs (e.g. methotrexate, sulphasalazine), although of possible benefit for peripheral joint disease, have no demonstrable benefit for inflammatory spinal disease.
 - Cutaneous psoriasis: requires treatment according to dermatology guidelines.
 - Inflammatory bowel disease: requires treatment according to gastroenterology guidelines.
 - Patients who do not satisfy eligibility criteria for biologic therapy for spinal disease alone, may yet satisfy criteria for treatment of co-morbidities and, if initiated, these treatments

may still provide important symptomatic and functional benefit for the spine. A multidisciplinary perspective is therefore essential.

- Sexually transmitted diseases: require full genitourinary assessment to exclude concurrent and persistent infections.
 - Uveitis: may be sight threatening and affects 5% of people with inflammatory spinal disease. Early access to specialist ophthalmology services is essential where uveitis suspected.
 - Osteoporosis: inflammatory spinal disease is a risk factor for osteoporosis and spinal fracture. Follow national guidelines on osteoporosis diagnosis and treatment.
- Definition satisfactory result
 - Maximised long term health-related quality of life through control of symptoms and inflammation, prevention of progressive structural damage, preservation/normalisation of function and social participation. Long term access to specialist care access indicated.
- Evidence base and its level of evidence.
 - NICE TA143 (adalimumab, etanercept and infliximab for ankylosing spondylitis) and TA233 (golimumab for the treatment of ankylosing spondylitis).
 - Braun, J., et al. 2010 update of the ASAS/EULAR recommendations for the management of ankylosing spondylitis. *Ann. Rheum. Dis.* 2011;70:896-904.

Please note that this will be the same triage and treat practitioner as Boxes 9, 11 and 13

Overview

Lumbar radicular pain is where the clinician suspects the pain is coming from a lumbar nerve root. This suspicion may vary between clinicians and is effectively a probability, based initially on symptoms. Typical symptoms are of pain, sensory disturbance and/or weakness in the lower with a dermatomal distribution. However, symptoms may be only in the thigh (upper lumbar nerve roots) or buttock. The more proximal the pain, the less likely is a diagnosis of lumbar radicular pain. Lumbar radicular pain is very rarely a cause of just low back pain. Clinical signs may change the probability that the symptoms are nerve root in origin and the final probability from symptoms and signs may dictate early management and whether imaging should be performed. An MRI showing lumbar nerve root compression does not confirm the diagnosis of lumbar radicular pain but simply changes the probability depending on symptoms and signs. Nerve root compression on MRI may be equivocal or absent; this doesn't exclude symptoms arising from the lumbar nerve root but is likely to change management options.

Referred pain is simply one minus the probability of radicular pain, and may frequently radiate below the knee.

The variability in severity and clinical course makes rigid rules impossible.

- Provision of time line.
 - May be identified at initial presentation
- Definition of skills / competencies required. In addition to those in Box 3
 - Essential competencies
 - Clinical screening for serious pathologies: tumour, infection, major neurological deficit, osteoporotic collapse, inflammatory disease.
 - Excluding emergency symptoms such as impending cord compression or cauda equina
 - Able to take a clear history distinguishing leg pain from back pain
 - Defining management so far including analgesia
 - Assessment of severity of symptoms – tolerable / non-tolerable
 - Referral for diagnostic tests
 - Interpretation of Scans in conjunction with radiologists report
 - Referral for diagnostic nerve root blocks
 - Referral for therapeutic spinal injections nerve root block/epidural
 - Referral for surgical opinion
 - Essential Skills
 - Clinical examination of the spine Including
 - lower limb neurological examination
 - assessment of weakness and long-tract signs
 - Ability to diagnose lumbar radicular pain, myelopathy and neurogenic claudication.
 - Communication of diagnosis and prognosis
 - Shared decision making
 - Expectation management

- Link to other source of advice.
 - Different skill levels amongst the assessment staff
 - Link with Spinal and Radiology MDT
 - Pain Management Services (Box 16)
 - Spinal on call service
 - Employment Services (Box 24)

- Entry criteria.
 - Severe radicular pain at 2-6 weeks depending on severity and improvement
 - Non-tolerable radicular pain at 6 weeks

- Exit Criteria.
 - Emergency referral to Spinal Surgery Service if suspected spinal cord compression or cauda equina syndrome (Box 6).
 - Urgent referral to Spinal Surgery Service or urgent MRI if suspected tumour or infection (Box 6).
 - Severe or progressive motor deficit (e.g. foot drop)

- Essential Referral Information.
 - Duration, severity and location of leg pain
 - Medical history
 - Current medication
 - Treatment so far including analgesia tried

- Patient Assessment.
 - Red Flags, including cauda equina Syndrome (see box 6)
 - Episode history and progress
 - Assessment of severity of symptoms: Clinical and EQ5D/ODI/VAS
 - Observation of spine, lower limbs, gait, pain behaviour.
 - Neurological examination
 - Impact on family, social and work ability
 - Psycho-social assessment

- Shared Decision Making / Patient Choice.
 - Depends on severity of symptoms, patient beliefs, expectations and objectives
 - Discharge if symptoms settle (Box 5) with staged return to work (Box 24).
 - Conservative Therapy (Box 18) if symptoms not severe enough to consider invasive treatments or patient's decision.
 - Investigation (Box 19) if non-tolerable radicular pain 8 weeks after onset of symptoms or earlier if severe, non-controllable pain.
 - MRI
 - CT scan MRI scan contraindicated or not tolerated.
 - Goal setting / Realistic expectations

- Interventions.
 - Advice and Information
 - Cauda Equina Syndrome
 - Advice on the natural history of radicular pain
 - Advice on management options: pain management, nerve root injection, surgery

- Measurement point for quality standard and outcome, PROMS.
 - % referred for MRI
 - % referred to Spinal MDT
 - % referred to Spinal Surgery Service / conversion rate to surgery
 - % Referred to pain management
 - Number of missed / delayed diagnosis of cauda equina syndrome
 - EQ5D & ODI
 - PREMS

- Self Management.
 - Patients should be given the option for self-management with analgesia and possibly manual therapy.
 - GP or over the counter medication
 - Self directed exercise programme
 - Self directed relaxation techniques
 - Self directed return to work
 - Self directed return to normal social and leisure activities

- Co-morbidity
 - Cardiac
 - Diabetes
 - Mental Health
 - Musculoskeletal (other than back pain)
 - Obesity
 - Neurological
 - Respiratory

- Definition satisfactory result.
 - Choice for conservative management
 - Patient reported improvement
 - Patient choice to self manage

- Evidence base and its level of evidence.
 - Clinical guidelines recommend triage and treat services.

Overview

The function of the triage and treat practitioner is to direct the pathway of care and provide continuity of care across the pathway. It is important that this will be the same clinician a box 8, 11 and 13. This clinician is highly trained and has significant skills, competencies and high autonomy (appendix 2).

They have a major role in the:

- identification and referral of emergency spinal presentations
- identification, investigation and referral of urgent spinal presentations.
- identification and discharge of patients who can self manage
- identification, investigation and referral of radicular pain,
- identification and referral of inflammatory disorders.
- Identification and referral of back pain related disability
- Identification, investigation and referral of potential surgical candidates with severe radicular pain or axial back pain (who have optimised non-surgical options).

In some instances the triage practitioner might be bypassed but it is to this practitioner that the pathway will return to if there is insufficient response to treatment or concerns are raised about diagnosis or any other matter.

- Provision of time line.
 - Within 2 weeks of early triage (Box 3) or following a trial of Core Therapies (Box 10)
- Definition of skills / competencies required
 - Essential competences: In addition to those in Box 3
 - Excellent communication skills
 - Comprehensive psychosocial assessment for risk of persisting pain related disability.
 - Identification of presentations suggestive of neurological, vascular or abdominal origin. Assessment of severity and impact of symptoms – tolerable / non-tolerable
 - Assessment of medication effectiveness and identification of side effects, adherence, dependency or misuse.
 - Defining management so far including analgesia
 - Referral for diagnostic tests
 - Referral to other services
 - Knowledge of the locally commissioned back pain pathway
 - Knowledge of international and national back pain guidelines.
 - Understanding and identification of pain as a primary condition.
 - Referral for nerve root block / surgical opinion

Essential Skills: In addition to those in Box 3

- Ability to undertake a comprehensive spinal bio-psychosocial assessment including screening questionnaires, interview and clinical examination.
- Ability to request diagnostics including MRI scans, nerve root blocks, CT scans and bloods.
- Ability to interpret spinal radiology images in conjunction with the radiologists reports.
- Ability to identification pain as a primary condition
- Ability to communicate diagnosis and prognosis
- Ability to discuss the risks and benefits of appropriate treatment options and facilitate patient choice through shared decision making
- Ability of manage complex patient expectations
- Ability to discuss the benefits of remaining in work.

- Ability to present cases at MDT meetings.
 - Ability to refer appropriately to services across the pathway.
- Link to other source of advice: In addition to those in Box 3
 - Occupational Health Services (Box 24)
 - Disability employment advisers
 - Pain Management Services including CPPTP and psychology (Box 12, 16)
 - Radiology
 - Spinal and Radiology MDT
 - Spinal on-call service
- Entry criteria
 - Symptoms or signs of lumbar origin present for > 3 weeks not suitable for core therapies
 - Insufficient improvement with primary care management and advice
- Exit Criteria
 - Suspected metastatic spinal cord compression, cauda equina syndrome, or infection.
 - Radiologically confirmed tumour, infection, acute fracture or spinal inflammatory disease.
 - Non-spinal presentation
- Essential referral information
 - As Box 3 and
 - Response to early management
- Patient Assessment (As box 3)
 - Patient expectations and beliefs
 - Comprehensive neurological examination including long tract signs
- Shared Decision Making / Patient Choice
 - Self management (Box 5)
 - Inflammatory Diseases (Box 7)
 - Core therapies including low intensity CPP (Box 10)
 - Radicular pain pathway (Box 8)
 - Specialist Pain Service (Box 16)
- Interventions: (In addition to box 3)
 - Advice and information
 - Diagnostic explanation including imaging
 - Prognostic explanation
 - Address specific patient concerns
- Measurement point for quality standard and outcome, PROMS.
 - % screened for serious pathologies
 - Reporting of number of missed specific pathologies (tumour, Cauda equina syndrome, inflammatory disease, fracture)
 - EQ5D, ODI and VAS.
 - Global rating of progress.
- Self Management
 - As box 3
- Co-morbidity
 - As box 3

- Definition satisfactory result
 - Patient reported improvement
 - Successful return to normal activities including work
 - Patient choice to self manage

- Evidence base and its level of evidence.
 - Internationally clinical guidelines consistently recommend spinal triage including screening of red flags and the assessment of psychosocial risk factors.

Practitioners delivering core therapy may also have responsibilities for onward direction following treatment. This will be dependent on local pathway arrangements.

- Provision of Time line:
 - For standard referrals patients should be seen within 2 weeks subject to patient choice (patients with intermittent pain, mild to moderate reduction in function and activities of daily living).
 - For urgent referrals patients should be seen within 72 hours subject to patient choice (patients dependent on strong analgesics, severe sleep disturbance, condition likely to deteriorate without therapy, severe impairment of activities of daily living, pregnant women under 35 weeks).

<https://www.supply2health.nhs.uk/AQPResourceCentre/AQPServices/PTP/Pages/BackNeckPain.aspx>
- Definition of Skills / competencies:
 - Essential competencies
 - Knowledge and understanding of clinical care pathways for people with back pain
 - Formulate a working and differential diagnoses and prognosis
 - Monitor and re-assess patient whilst under their care
 - Good communication skills
 - Understand the process of consent and the need to involve the patient in decisions about their care and set goals and objectives of care
 - Deliver a range of treatment options that may include advice, self-management, manual therapy, acupuncture, exercise approaches and psychologically informed care
 - Understand and evaluate the quality of care delivered
 - Understand and interpret symptoms and signs that may indicate serious pathology
 - Advise patients on the appropriate use of pain relief and pain modifying medications and other pain management strategies
 - Recognise the need to work within their scope of practice.
 - Understanding of interdisciplinary working
 - Essential competencies
 - Ability to undertake a bio psychosocial assessment of the patient. This includes history of presenting condition, assessing and eliciting psychological and social issues related to the presenting condition and physical examination.
 - Ability to Identify: “red flag” associated pathologies; co-morbidities; modifiable psychosocial obstacles (yellow flags) to recovery (including application of stratification tools where appropriate).
 - Advise patient about the signs and symptoms of a developing Cauda Equina syndrome and what actions that they should take (medical emergency).
 - Ability to assess progress and keep diagnosis under review.
 - Ability to select and refer patient to appropriate services
 - Ability to communicate diagnosis and care plan to patients and colleagues as required
 - Ability to undertake specific Patient Reported Outcome Measures (PROMs) and understand the significance of these.
- Link to other source of advice
 - Triage Service (Box 9)
 - Bone Metabolism/osteoporosis service
 - Employment services (Box 24)
 - Specialist pain services including CPP and psychology
 - Radiology

- Rheumatology
 - Spinal on-call service
 - Spinal surgical service
- Entry criteria:
 - Patients with non-specific low back pain
 - Exclude patients with non-response to optimal delivery of all of the core therapies for current episode
 - Exit criteria:
 - Confirmed radiculopathy including new onset severe or progressive motor deficit (e.g. foot drop)
 - Serious (red flag) pathologies such as Cauda Equina syndrome, cancer (including metastatic disease), infection and fracture.
 - Essential referral information
 - Diagnosis of non specific low back pain
 - Appropriate for core therapies.
 - C-morbidities.
 - Patient assessment:
 - Red Flags, including cauda equina Syndrome (see box 6)
 - History taking including medical, psychological and social factors, previous treatments effect, severity of pain/disability and patient's understanding of their condition and their expectations.
 - Physical examination including observation, spinal mobility, neurological examination, and relevant differential diagnostic tests as necessary.
 - Appropriate use of stratification tools if not previously undertaken.
 - Shared Decision making/patient choice:
 - Self-management
 - Core therapies (manual therapy including mobilisation and manipulation techniques, acupuncture and exercise including low intensity CPP as appropriate)
 - Clinical review
 - Interventions:
 - A package of care tailored to the individual in terms of treatment options and frequency of treatment delivery will be considered taking account of patient expectations and preferences. Low back pain related distress, anxiety, fears, beliefs and expectations should be addressed as an integral part of the package of care.
 - It is anticipated that the number of treatment consultations will vary between patients with many needing short periods of care. If necessary, core treatments may be used up to the limit indicated below. After this dedicated review should take place e.g. Triage investigation and treatment practitioner or referral to specific services relevant as indicated in the pathway. Potential treatment options with indicative suggestions of frequency and duration are listed below:
 - Acupuncture: Up to 10 sessions over a period of up to 12 weeks
 - Manual therapy: Including mobilisation, massage and spinal manipulation up to 9 sessions over a period of up to 12 weeks.
 - Exercise: Structured exercise group programme up to 8 sessions over 12 weeks: aerobic activity, movement instructions, muscle strengthening postural control and stretching.
 - 1-1 if group is not available or appropriate
 - Discharge on satisfactory response (box 5) including ability for patient to return to GP or triage practitioner if persistent concerns exist.

- Referral to RTW / Occ. Health (box 24), triage service for review (box 11)
- Measurement Point Quality standard and outcome, PROMS:
 - Patients should be assessed pre-treatments and at appropriate point or points during care.
 - VAS, ODI, EQ5D
 - PCOMS
- Self Management:
 - Discuss analgesia use and access to a prescribing clinician.
 - On the nature of non-specific low back pain and that improvement is likely
 - Stay active or progressively increase activity where possible including return to work
 - Address specific patient concerns and expectations
 - Indications for clinical review and emergency attendance
 - Patient information including the Back Book
- Co-morbidity
 - Co-morbidities should be identified and consideration given to how care may need to be modified. Patients should be referred or signposted appropriately.
 - Cardiac
 - Mental Health
 - Musculoskeletal (other than back pain)
 - Neurological
 - Respiratory
- Definition of satisfactory result:
 - Clinically significant improvement in PROM with reduction of pain, disability, and psychosocial factors.
 - Return to usual activities (including return to work).
 - Improved patient self-management
 - High levels of patient satisfaction with care and patient reported experience.
- Post Shared Decision Making / Patient Choice
 - Self management (Box 5)
 - Specialist Triage (Box 9, 11, 13)
 - Specialist Pain Service (Box 16)
- Evidence base and level of evidence.
 - Early management of persistent non-specific low back pain NICE CG88
<http://www.nice.org.uk/CG88>

Please note that to provide continuity of care across the pathway this will be the same clinician as Box 9

At this point particular consideration should be given to possible diagnosis of pain as a primary condition. This will guide the decision of moving down the specialist pain pathway or the more physically intensive CPPTP.

- Provision of time line.
 - Not before 12 weeks from initial presentation and management
- Definition of skills / competencies required
 - Essential competences and skills: As box 3 & 9
- Link to other source of advice
 - As Box 3 & 9
- Entry criteria
 - Symptoms or signs of lumbar origin present for > 12weeks
 - Insufficient improvement with core therapies.
- Exit Criteria
 - Suspected metastatic spinal cord compression, cauda equina syndrome, or infection.
 - Radiologically confirmed tumour, infection, acute fracture or inflammatory disease.
 - Non-Spinal presentation
 - Choice: Self Management
- Essential referral information
 - As Box 3
 - Response to core therapies
- Patient Assessment As Box 3 & 9
- Shared Decision Making / Patient Choice
 - Self management (Box 5)
 - Core therapies including low intensity CPP (Box 10)
 - Radicular pain pathway (Box 8)
 - High intensity CPPTP (Box 12) Decision based on
 - Significant disability from Low Back Pain with insufficient response to Core Therapies
 - Expectation of continuing improvement
 - Expected outcome work ability
 - No physical co-morbidity which would preclude exercise
 - Working age group
 - Suitable for group format
 - Psychological approach (CBT principles, goal setting, problem solving) with
 - Intensive physical exercise component
 - Specialist Pain Service (Box 16). Decision based on diagnosis of pain as a primary condition or where there are specific interventions or significant psychological issues that can't be addressed by a CPPTP
 - Multiple pain sites rather than focused in the back
 - Patients are taking large prescribed doses of opioids (>120mg daily morphine equivalents) and/or additional medication
 - Patients are exhibiting disabling levels of distress, depression or anxiety

- Patients are using alcohol or other prescribed drugs inappropriately to relieve symptoms of pain and distress
 - Patients are using recreational drugs to relieve their pain
 - Significant fatigue
 - Poor prognosis for recovery
 - Co-morbidities precluding exercise
 - Severe disability (wheelchair, house bound)
 - Under 16 or retired.
 - Patients are significantly functionally impaired and other interventions have failed
 - Patients are referred for consideration of spinal cord stimulation
 - Patients are considered appropriate for epidural, nerve root block or medial branch nerve blocks / radiofrequency lesioning assessment as a part of a MDT management plan
 - Senior clinical review
- Interventions
 - Advice and information
 - Stay active including work
 - Pharmacy advice available
 - Fit note
 - Indications for clinical review and emergency attendance
 - Diagnostic explanation including imaging
 - Prognostic explanation
 - Address specific patient concerns
- Measurement point for quality standard and outcome, PROMS.
 - Reporting of number of missed specific pathologies (tumour, Cauda equina syndrome, inflammatory disease, fracture)
 - EQ5D & ODI
 - Global rating of progress.
- Self Management:
 - Patient information (Box 1)
 - GP or over the counter medication
 - Self directed exercise programme
 - Self directed relaxation techniques
 - Self directed return to work
 - Self directed return to normal social and leisure activities
- Co-morbidity
 - Cardiac
 - Diabetes
 - Mental Health
 - Musculoskeletal (other than back pain)
 - Obesity
 - Neurological
 - Respiratory
- Definition satisfactory result
 - Patient reported improvement
 - Successful return to normal activities including work
 - Patient choice to self manage
- Evidence base and its level of evidence.
 - There are no clinical trials related to the cost effectiveness of clinical review

Overview

This is appropriate at this stage in the pathway for people with disabling back pain that has been refractory to optimal treatment including the core therapies and the less intensive (uni-disciplinary) programmes. These are typically multidisciplinary and high intensity. The exact duration will depend upon patient needs. In CG88, NICE found the best evidence was for programmes of at least 100 hours of exposure. The economic evaluation recommended that CPPTP should be made available to those who continued to report high levels of disability and /or distress after one or more core therapies.

This type of intensive programme may be delivered over a period of up to 8 weeks but often are delivered on a full time basis over a three week period. This programme contains many elements common to Pain Management Programmes of shorter duration, but with a different emphasis. Suitable referrals for this programme are those patients where recovery, and for example return to work, is anticipated or where in the event of insufficient improvement surgery may be an option. Some patients may be more suitable for a PMP (box 16) as described in the exclusions.

- Provision of time line.
 - 12 - 18 weeks from initial presentation and management
- Definition of skills / competencies required. This requires a multi-disciplinary team.
 - Essential competences
 - Design and delivery of tailored exercise programmes including aerobic, gym equipment and pool exercises
 - Delivery on CBT principles
 - Excellent communication skills.
 - Goal setting
 - Creative problem solving
 - Review of medication usage and effectiveness
 - Psychological skills
 - Understanding of interdisciplinary working
 - Understanding of simulated work activities work adaptation including graded return and fit notes
 - Knowledge and understanding of pathways of management for people with back pain
 - Essential Skills
 - Motivation and reassurance
 - Understanding principles of behavioural change
 - Shared decision making
 - Expectation management
 - Ability to apply CBT principles.
 - Ability to undertake specific Patient Reported Outcome Measures (PROMs) and understand the significance of these.
 - Ability to facilitate positive group work
 - Ability to design and implement a exercise programme tailored to the individual (delivered in group)
 - Ability to set patient specific goals
 - Ability to teach and apply principles of pacing
 - Ability to teach and deliver relaxation
 - Ability to teach and facilitate problem solving
 - Ability to design simulated work activities and facilitate return to work

- Ability to issue fit notes and agree and communicate a graduated return to work plan.
 - Ability to facilitate helpful coping strategies.
- Link to other source of advice
 - Triage Service (Box 11)
 - Pain Management (Box 16)
- Entry criteria
 - Significant disability from Low Back Pain with insufficient response to Core Therapies
 - Expectation of continuing improvement
 - No physical co-morbidity which would preclude exercise
- Exclusion criteria
 - Multiple pain sites rather than focused in the back
 - Patients are taking large prescribed doses of opioids (>120mg daily morphine equivalents) and/or additional medication
 - Patients are exhibiting disabling levels of distress, depression or anxiety requiring specific therapy
 - Patients are using alcohol or other prescribed drugs inappropriately to relieve symptoms of pain and distress
 - Patients are using recreational drugs to relieve their pain
- Exit Criteria
 - Completion of Programme
 - Choice: Self management
 - Triage Service
- Essential referral information
 - History of Back Pain Episode
 - Previous treatments
 - Social and work impact
 - Current pain pharmacology
 - Any identified objectives of patient
- Patient Assessment
 - Back pain history, management and outcome
 - Pain severity and % back and leg pain
 - Patient expectations and beliefs
 - Impact on family, social and work ability
 - Patient specific objectives
- Prior Shared Decision Making / Patient Choice
 - Understanding of patient objectives
 - Tailoring of aspects of programme
- Interventions
 - Intensive physical and psychological rehabilitation programme
 - Up to 100 contact hours in up to 8 weeks (NICE CG88)
 - May be delivered on a full time basis
 - Work and occupation related activities
 - On CBT Principles
 - Outwith health care setting
 - De-medicalisation of condition, Group sessions
 - Self reliance, coping strategies and goal setting/problem solving

- Pain self management skills
- Advice and information
 - Improvement is likely
 - Pharmacy advice available
- Measurement point for quality standard and outcome, PROMS.
 - Time to presentation
 - Return to Work or Occupation
 - Ability to self manage
 - EQ5D
 - Back Specific Disability Score
 - Measurement of affect
- Self Management
 - Self directed exercise programme
 - Self directed return to normal Employment, occupation, social and other activities
 - Patient information including the Back Book
 - GP or over the counter medication
- Co-morbidity
 - Cardiac
 - Mental Health
 - Musculoskeletal (other than back pain)
 - Neurological
 - Respiratory
- Definition satisfactory result
 - Return to work / occupation
 - Improved EQ5D / Back Specific Disability Score
 - Patient reported improvement
 - Patient choice to self manage
- Post Shared Decision Making / Patient Choice
 - Self management (Box 5)
 - Specialist Surgical Opinion (Box 14)
 - Specialist Pain Service (Box 16)
- Evidence base and its level of evidence.
 - NICE CG88.

Please note that to provide continuity of care across the pathway, this will be the same clinician as Box 9 and 11.

- Provision of time line.
 - No earlier than 18 weeks from initial presentation
- Definition of skills / competencies required
 - Essential competences: As box 3 & 9
- Essential Skills: In addition to box 3 & 9
 - Knowledge and skills to discuss the risks and benefits of treatment options including the potential role of spinal surgery.
- Link to other source of advice: In addition to box 3 & 9
 - Spinal surgical service
- Entry criteria
 - Symptoms or signs of lumbar origin present for > 18 weeks
 - Insufficient improvement with core therapies or CPPTP
- Exit Criteria: In addition to box 3 & 9
 - Sufficient improvement following completion of CPPTP
- Essential referral information: In addition to box 3 & 9
 - Response to CPPTP
- Patient Assessment: As box 3 & 9
- Shared Decision Making / Patient Choice
 - Self management (Box 5)
 - Radicular pain pathway (Box 8)
 - Specialist Pain Service (Box 16)
 - Referral for surgical opinion (Box 14)
- Interventions: As box 3 & 9
- Measurement point for quality standard and outcome, PROMS.
 - % referred on for a surgical opinion, or pain service
 - Reporting of number of missed specific pathologies (tumour, Cauda Equina Syndrome, inflammatory disease, fracture)
 - EQ5D
 - Global rating of progress.
- Self Management; As box 3 & 9
- Co-morbidity: As box 3 & 9
- Definition satisfactory result: As box 3 & 9

- Provision of time line.
 - 4 - 6 months from initial presentation and management
- Definition of skills / competencies required. This is a specialist Spinal Surgeon
 - Essential competences
 - Excellent communication skills.
 - Evaluation of psycho-social factors
 - Evaluation of natural history of low back pain
 - Evaluation of technical surgical factors
 - Understanding of investigations
 - Explanation of benefits and risks
 - Decision making between surgical procedures
 - Essential Skills
 - Motivation and reassurance
 - Shared decision making
 - Expectation management
 - Ability to undertake specific Patient Reported Outcome Measures (PROMs) and understand the significance of these.
- Link to other source of advice
 - Pain Management
- Entry criteria
 - Significant disability from Low Back Pain with insufficient response to CPPP or PMP if appropriate
 - Expectation of continuing improvement
 - No physical co-morbidity which would preclude surgery
- Exclusion criteria
 - Multiple pain sites rather than focused in the back
 - Patients are taking large prescribed doses of opioids (>120mg daily morphine equivalents) and/or additional medication
 - Patients are exhibiting significant distress
 - Patients are using alcohol or other prescribed drugs inappropriately to relieve symptoms of pain and distress
 - Patients are using recreational drugs to relieve their pain
 - Patients are significantly depressed and anxious because of their pain
 - Patient who are not fit for surgery due to co-morbidities,
- Exit Criteria
 - Performance of surgery
 - Choice: Self management
 - Specialist pain services
- Essential referral information
 - History of Back Pain Episode
 - Previous treatments
 - Social and work impact
 - Current pain pharmacology
 - Specific objectives of patient
 - CPPTP report

- Patient Assessment
 - Back pain history, management and outcome
 - Pain severity and % back and leg pain
 - Patient expectations and beliefs
 - Impact on family, social and work ability
 - Patient specific objectives

- Prior Shared Decision Making / Patient Choice
 - Understanding of patient objectives
 - Self management (Box 5)
 - Specialist Pain Service (Box 16)
 - Spinal surgery (Box 15)

- Measurement point for quality standard and outcome, PROMS.
 - Time to presentation
 - Return to Work or Occupation
 - Ability to self manage
 - EQ5D
 - Back Specific Disability Score
 - % conversion to surgery
 - Missed serious spinal pathologies
 - % who have not attended CPPTP before surgical opinion.

- Self Management
 - Self directed exercise programme
 - Self directed return to normal Employment, occupation, social and other activities
 - Patient information including the Back Book
 - GP or over the counter medication

- Co-morbidity
 - Cardiac
 - Mental Health
 - Musculoskeletal (other than back pain)
 - Neurological
 - Respiratory

- Definition satisfactory result
 - Return to work / occupation
 - Improved EQ5D / Back Specific Disability Score
 - Patient reported improvement
 - Patient choice to self manage

- Post Shared Decision Making / Patient Choice
 - Self management (Box 5)
 - Specialist Pain Service (Box 16)

- Evidence base and its level of evidence.
 - NICE CG88 (Four RCTs, systematic review and meta-analysis)
 - Swedish Spine Registry (improvement one third Quality maintained over 5 years)

- Provision of time line.
 - 6 - 8 months from initial presentation and management
- Definition of skills / competencies required. This is a specialist Spinal Surgeon.
 - Essential competences
 - Excellent communication skills.
 - Ward environment
 - Post operative pain management
 - Post operative therapy
 - Essential Skills
 - Motivation and reassurance
 - Shared decision making
 - Expectation management
 - Technical surgical skills
 - Management of complications
 - Ability to undertake specific Patient Reported Outcome Measures (PROMs) and understand the significance of these.
- Link to other source of advice
 - In patient Pain Management
 - Anaesthesia
 - Physiotherapy
 - Specialist pain service
- Exit Criteria
 - Choice: Self management
 - Unfit for Surgery
- Shared Decision Making / Patient Choice
 - Understanding of patient objectives
- Interventions
 - Fusion surgery
 - Anterior
 - Muscle preserving
 - Large fusion area
 - Less bleeding
 - Risk of vascular complications
 - More difficult to revise
 - Specialised
 - Posterior
 - Can be combined with decompression
 - Familiar approach
 - With or without fixation
 - Smaller fusion area
 - PLIF/ TLIF
 - Dural / root retraction
 - Intra-canal scarring
 - Technical cage failures
 - Total disc replacement
 - Requires normal facet joints

- Immediate fixation
 - Risk of implant failure / subsidence
 - Very difficult to revise
 - Specialised
- (flexible stabilisation)
 - Discredited
- Measurement point for quality standard and outcome, PROMS. Best practice is to be part of a recognised spine registry (BSR/Spine Tango).
 - Time to presentation
 - Return to Work or Occupation
 - Ability to self manage
 - EQ5D, ODI, VAS
 - Complications
- Self Management
 - Self directed exercise programme
 - Self directed return to normal Employment, occupation, social and other activities Patient information including the Back Book
 - GP or over the counter medication
- Co-morbidity
 - Cardiac
 - Mental Health
 - Musculoskeletal (other than back pain)
 - Neurological
 - Respiratory
- Definition satisfactory result
 - Return to work / occupation
 - Improved EQ5D / Back Specific Disability Score
 - Patient reported improvement
 - Patient choice to self manage
- Post Shared Decision Making / Patient Choice
 - Self management (Box 5)
 - Specialist Pain Service (Box 16)
- Evidence base and level of evidence
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Overview - Specialist Pain Management Services assist in the multidisciplinary management of patients with back pain and radicular pain by alleviating pain, reducing distress, aiding functional restoration and reducing the socio-economic burden of pain for the individual, the healthcare system and the community.

Specialist Pain Management Services may need to refer a very limited number of patients with exceptionally complex pain problems onto Specialised Pain Management Services and may need to provide some ongoing care for these patients after assessment and treatment in these Specialised Services.

- Provision of time line
 - The Service must comply with national targets in relation to referral to treatment targets - currently 18 weeks.
 - International Association for the Study of Pain (IASP) recommend that patients with severe progressive pain with the risk of increasing functional impairment generally of six months duration or less are seen within one month.
- Definition of skills/ competencies required
 - Essential Competencies
 - Multi-specialty and multi disciplinary assessment and management comprising
 - Preparation of a MDT management plan through shared decision making with the patient.
 - Clinically led by Consultants in Pain Medicine.
 - Multi-specialty skills **must** include specialist Clinical Psychologists, Physiotherapists, Occupational therapists and Nurses.
 - Ability to work in multidisciplinary clinics
 - Comprehensive understanding of physiological and pathological processes.
 - Identification of significant psychological components
 - Have a clear knowledge of pharmacological interventions, physical interventions (including spinal cord stimulation (SCS), nerve root blocks, epidurals, medial branch nerve blocks, sacro-iliac injections, radiofrequency lesioning, and Intrathecal drug delivery) and individual and group psychological interventions (including standard and intensive Pain Management Programmes).
 - A high level of understanding of pathological causes of pain, their assessment and management as well as pain as a condition in its own right.
- Link to other source of advice
 - Specialised Pain Management (Box 17)
 - Surgical Opinion (Box 14)
- Entry criteria including necessary investigations/results
 - Patients may be referred from General Practitioners, Triage, Investigation and Treat Practitioners, Orthopaedic Surgeons, Neurosurgeons, Pain Management Specialists or any skilled practitioner that has undertaken appropriate assessment.
 - Patients should be referred if:-
 - Pain has not responded to previous treatment
 - Multiple pain sites rather than focused in the back
 - Patients are taking large prescribed doses of opioids (>120mg daily morphine equivalents) and/or additional pain management medication

- Patients are exhibiting disabling levels of distress, depression or anxiety
 - Patients are using alcohol or prescribed drugs inappropriately to relieve symptoms of pain and distress
 - Patients are using recreational drugs to relieve their pain
 - Patients are significantly functionally impaired and other interventions have failed
 - Patients are referred for consideration of spinal cord stimulation
 - Patients are considered appropriate for epidural, nerve root block or medial branch nerve blocks / radiofrequency lesioning assessment as a part of a MDT management plan
- Exit Criteria
 - Completion of Programme
 - Choice: Self management
- Essential referral information
 - History of Back Pain Episode
 - Previous treatments
 - Social and work impact
 - Current pain pharmacology
 - Specific objectives of patient
- Patient assessment
 - Interdisciplinary team assessment. An interdisciplinary team is an integrated working group where each individual has a high level of expertise in different aspects of management of patients with a complex condition, such as pain
 - Back pain history, management and outcome
 - Patient expectations and beliefs
 - Impact on family, social and work ability
 - Patient specific objectives Multispecialty pain assessment may be available in Specialist Pain Services. A multispecialty team is a team of specialty experts that represent different disciplines involved in the assessment and management of pain, associated illness and consequences for daily functioning. For example, Specialist Pain Medicine and Psychiatry for problems such as pain and prescribed substance misuse or recreational drug misuse.
- Shared Decision making/Patient Choice
 - Shared decision making and patient choice is paramount in patient engagement in Specialist Pain Management Services.
 - Shared Care Arrangements are a vital part of this pathway with regard to Primary and Community Care and to Specialised Pain Management Services
 - Understanding of patient objectives
 - Tailoring of aspects of programme
- Interventions
 - Provide physical, psychological and behavioural interventions that support patients and their carers in managing their pain, enabling patients to lead more normal lives with reduced disability.
 - Provide individual care for patients with low back pain
 - Provide interventions to reduce attendance at the Emergency Department for acute on chronic exacerbations of back pain
 - Provide inpatient support for these patients who have high medical and psychological complexity, particularly where they are using controlled drugs
 - Treatments involving complex manipulations of medications, including opioids
 - Many patients require or are referred for physical interventions such as SCS, nerve root blocks, or epidurals, medial branch nerve blocks and denervation, which should be undertaken only in the context of a multidisciplinary team approach

- Appropriate facilities and multidisciplinary staffing must be available which may take place within a Specialist Pain Service.

- **Specific Interventions**

- 1. **Pain Management Programmes (PMP)**

The general aim of a PMP is to improve participation in daily activities, increase functionality and enhance quality of life for those with persistent pain and disability. There may be similarities and overlap between PMPs and Combined Physical and Psychological Programme (CPPP). Both are group programmes which use psychological principles throughout. However, PMPs are for patients with more complex pain related disability (see entry criteria), involve a wider MDT in integrated care, and applies a greater depth of psychology, whereas CPPP contains a much more intensive physical therapy base.

- **Provision of Timelines**
 - Pain Management Strategies can be applied flexibly within care pathways
- **Entry Criteria**
 - Promotion of return to work is an important component of a PMP and can be the main focus of some. Suitability for a PMP is based on the impact of pain.
 - There are no grounds for discrimination on the basis of age, literacy, litigation or judgement of motivation.
- **Patient Assessment**
 - It is crucial for PMP clinical staff to assess participants comprehensively
- **Interventions**
 - PMP interventions can be classified broadly into three groups.
 - Targeted early PMP interventions stratified to risk (Low risk on STarT Back Tool will have been triaged early in the pathway)
 - Standard PMPs
 - Intensive PMPs (usually delivered in Specialised Pain Services).
 - A standard PMP should be the equivalent of twelve half-day sessions (e.g. 12x3 = 36 hours). Longer, more intensive programmes give greater and more enduring benefit but intensive programmes are not recommended as standard for all patients.
 - Some very disabled and distressed patients will not benefit significantly from standard programmes but may benefit from more intensive programmes e.g. 15-20 full days. Intensive PMPs may be found in some Specialist and in Specialised Pain Management Services.
 - Individual psychology and physiotherapy may be required before, during or after PMPs for specific problems. Nurse and consultant involvement can be key for the patient, but particularly around drug optimisation.
 - A PMP is delivered by an interdisciplinary team where some competencies are shared and some are unique to particular professions. All staff use cognitive behavioural principles to deliver their component(s) of the PMP.
 - The effective delivery of standard and intensive PMPs for complex problems requires highly skilled staff, working as a team in adherence to the principles defined within the BPS Guidelines document.
 - PMPs may be delivered in a primary or a secondary care setting; the resources required will be the same. Evidence is growing that some principles of PMPs may be applied early in care pathways targeted to risk reducing future disability.
 - There is no evidence to support the use of 'booster' programmes, and problems maintaining gains made on the PMP require individual intervention focused on maintenance in the patient's own environment

- Evidence base and its level of evidence.
 - Guidelines for Pain Management Programmes for adults. *An evidence-based review prepared on behalf of the British Pain Society*. The British Pain Society. November 2013: http://www.britishpainsociety.org/pub_professional.htm

2. Nerve Root Block / Epidural

See Box 22

3. Facet joint injections and denervation

NICE Guidance for non-specific low back pain of duration from 6 weeks to 52 weeks did not evidence benefit from facet joint injection or sacroiliac joint injection with steroid during that time period for that indication.

The probability of lumbar facet joint involvement in back pain can be identified by diagnostic medial branch blocks of facet nerves and prolonged effect (up to one year) can be obtained by denervation.

Injection of depot preparations of steroid into or close to the facet joints can be a useful component of multidisciplinary treatment for persistent back pain beyond one year in some patients with lumbar spondylosis or scoliosis, for instance, where loss of disc height is associated with arthropathy or for synovitis.

Occasionally, synovial cysts of facet joint can result in radicular pain and aspiration/disruption may be helpful (see box 22).

- Time Line
 - Facet joint injections may be offered as a single procedure in long-standing back pain to facilitate progress with exercise based rehabilitation programmes.
 - Repeated treatments can only be justified where alternative treatments such as analgesic medication are intolerable or produce undesirable side effects, such as unsteadiness in the elderly, and should not be performed more often than 8-12 month intervals.
- Principal entry criteria including necessary investigations / results
 - Mechanical type low back pain of moderate to severe intensity of greater than 1 year's duration associated with suspected or proven facet joint arthropathy or synovitis.
 - Lack of suitability of alternative treatments
- Principal exclusion criteria
 - Local or systemic infection
 - Substantial therapeutic or constitutional anticoagulation
 - Patient unwilling/lack of cooperation
- Patient Assessment
 - Complete assessment of in all aspects of the presentation is required.
 - A full exploration psychological and social factors is necessary.
 - Management with injections should only be carried out within a MDT.
- Interventions

- The Royal College of Anaesthetists has produced and is producing further guidelines for the conduct of spinal injections, which should be adhered to by trained and competent practitioners and be performed under appropriate imaging.
 - Radiofrequency denervation of the medial branch nerves produces a more prolonged analgesic effect but this must be balanced against the potential for more significant complications.
 - Diagnostic medial branch of the posterior primary ramus nerve blocks with very small quantities of local anaesthetic are recommended as a diagnostic test before any destructive lesioning.
 - There may be sustained benefit from diagnostic local anaesthetic blocks especially when they are administered in the context of multidisciplinary rehabilitation, which is strongly recommended.
- Evidence base and its level of evidence.
 - Evidence of absolute effectiveness is limited.
 - NICE recommends that injections of therapeutic substances into the back for non-specific low back pain between 6 weeks and 1 year should not be given. *NICE Guidance NICE (2009) Low back pain: Early management of persistent non-specific low back pain. Clinical guideline (CG) 88. London.*
www.nice.org.uk/nicemedia/pdf/CG88NICEGuideline.pdf
 - http://bps.mapofmedicine.com/evidence/bps/low_back_and_radicular_pain3.pdf
 - The British Pain Society has suggested that: 'therapeutic facet joint intra-articular injections are only to be done in the context of either special arrangements for clinical governance and clinical audit or research' (British Pain Society Spinal Pain Working Group Consensus Opinion. 2012).
 - *British Pain Society and Faculty of Pain Medicine of the Royal College of Anaesthetists. Standards of good practice for medial branch block injections and radiofrequency denervation for low back pain. January 2014.*

4. Spinal Cord Stimulation

- Provision of Time Line
 - Currently the mean time for neuropathic pain to receiving a spinal cord stimulator is seven years. This time frame should be much shorter.
 - This would prevent suffering, and reduce ineffective therapies such as re-operation, repeat injections, medications and physical therapies.
- Definition of Skills/Competencies required. This is a multi-disciplinary team
 - Essential Competencies
 - Psychological Assessment
 - Functional Physiotherapy
 - Specialist neuromodulation skills
 - Implanting physician/neurosurgeon trained and practiced in a range of SCS techniques
 - Pain management specialist able to lead the Pain team and liaise with SCS implanter if different to self.
- Entry Criteria
 - Chronic radicular, neuropathic pain as judged by
 - history, clinical examination and sometimes supported by investigation such as nerve conduction studies and quantitative sensory testing
 - Chronic mixed back/spinal and radicular pain
 - Recurrence of pain or a failure of pain relief from anatomically successful spinal surgery.
 - Pain persistent for more than 6 months

- Insufficient benefit from a reasonable algorithm of evidenced based usual care
 - anti-neuropathic pain pathway, x-ray guided nerve root and epidural therapies, patient education, physical therapy
- Patient accepts that has long-term chronic condition
- Patient has cognitive ability to manage the therapy long term
- Exclusion criteria
 - Pregnancy at time of implant
 - Patient does not accept need for implantable device
 - Anticoagulant therapy where it is too dangerous to either stop or bridge to low molecular weight heparin
 - Uncontrolled coagulopathy
 - Multiple co-morbidity likely to result in a poor functional outcome
 - Known allergy to titanium steel or silicone
- Patient assessment
 - Interdisciplinary assessment from Pain medical specialist, Specialist Pain Psychologist and Physiotherapist and specialist neuromodulation nurse
- Shared Decision making/choice
 - The patient will be at the centre of the decision making on whether to proceed with SCS trial and implant
 - Procedural risks, long term risks and possible sequelae will be highlighted
 - MRI conditionality, car driving, pregnancy, incidental surgery
 - The type of equipment and lead insertion procedure (neurosurgical paddle or minimally invasive cylindrical leads) should be discussed with for or against arguments presented in a balanced way
- Intervention
 - Placement of spinal cord stimulator
 - Education concerning
 - Long-term patient responsibilities
 - Use of SCS including re-charging and hand held programmer
 - Drug reduction strategy
 - Rehabilitation requirements
 - Role and need for re-programming attendances
 - Occasional need for revision procedure
- Measurement point for quality standard and outcome, PROMS.
 - All SCS centres will be linked to the National Neuromodulation Registry. This collects data on:
 - Brief Pain Inventory, EQ5L, Global Impression of Change, Worst and Usual VASPI.
 - Device models and serial numbers, complications and explantation
- Definition of Satisfactory result
 - The minimum satisfactory result is a 30% reduction in usual NRS associated with an improvement of function as measured by BPI

5. Intrathecal drug delivery

A few patients who have severe refractory back and leg pain may still be improved long term by the application of Intrathecal drug delivery (ITDD). Typically these patients will have been fully assessed as above but failed all other therapies including a trial of spinal cord stimulation.

- Evidence base and level of evidence
 - http://www.britishpainsociety.org/book_ittd_main.pdf
 - http://www.britishpainsociety.org/book_ittd_patients.pdf

- **For All Interventions**

- Measurement point for quality standard and outcome, PROMS.
 - Time to presentation
 - Return to Work or Occupation
 - Ability to self manage
 - EQ5D
 - Back Specific Disability Score
 - The Brief Pain Inventory captures pain, and physical and emotional function data.
 - Documentation of any change is by measuring before and at least one month after treatment
 - % of A&E attendances and admissions
 - Health care utilisation

- Self Management
 - Self directed management of medication, physical and psychological therapies to maximise the benefit
 - Self directed return to normal Employment, occupation, social and other activities
 - Patient information including the Back Book

- Co-morbidity
 - Cardiac
 - Mental Health
 - Musculoskeletal (other than back pain)
 - Neurological
 - Respiratory

- Definition satisfactory result
 - Increase social and physical functioning, promoting return to work and maintaining productivity through employment
 - Improved EQ5D / Back Specific Disability Score
 - Patient choice to self manage
 - Patient reported improvement / satisfaction
 - Promotion of the highest possible quality of life for patients with persistent pain that is a Long Term Condition, enabling them to lead more normal lives with reduced disability
 - Supporting clinicians in managing the pain element of their patients care
 - Provision of inpatient support with management of pain problems of high medical and psychological complexity and the use of controlled drugs
 - Reducing recurrent in appropriate admissions and other health care services by promoting self management
 - Reducing inappropriate medical appointments and readmissions.

- Evidence base and its level of evidence.
 - NICE TA 159 published in 2008 and last considered for review in 2012 provides the evidence required for widespread adoption of SCS for refractory neuropathic pain. <http://publications.nice.org.uk/spinal-cord-stimulation-for-chronic-pain-of-neuropathic-or-ischaemic-origin-ta159>
 - NICE (2009) Low back pain: Early management of persistent non-specific low back pain. Clinical guideline (CG) 88. London: <http://www.nice.org.uk/CG88>

- NICE (2009) Management of long-term sickness and incapacity for work. Public Health Guidance 19. London:
- NICE (2010 and 2013) Neuropathic pain: the pharmacological management of neuropathic pain in adults in non-specialist settings. Clinical Guideline (CG) 173
- Interventional Procedure Guidance (IPG) 382.
- Royal College of Anaesthetists. Guidelines for the Provision of Anaesthetic Services. Chapter 12. Anaesthesia services for chronic pain management 2014.
www.rcoa.ac.uk/gpas2014.
- Royal College of Anaesthetists (2006) 'Raising the standard: a compendium of audit recipes: chronic pain services'
- Royal College of Anaesthetists (2003) 'Pain management services: good practice'
- Primary Assessment and Management. (community care)
<http://bps.mapofmedicine.com/evidence/bps/index.html>
- Spinal pain – low back pain and radicular.
<http://bps.mapofmedicine.com/evidence/bps/index.html>
- Musculoskeletal non-inflammatory.
<http://bps.mapofmedicine.com/evidence/bps/index.html>
- Neuropathic Pain.
<http://bps.mapofmedicine.com/evidence/bps/index.html>
- International Association for the Study of Pain (2009) 'Desirable characteristics for pain Treatment Facilities' www.iasp-pain.org:
- Recommendations for Wait-Times for Treatment of Pain www.iasp-pain.org:
- Recommendations for Pain Treatment Services www.iasp-pain.org:
- Development of Clinical Practice Guidelines in the Field of Pain www.iasp-pain.org:
- Desirable Characteristics of National Pain Strategies 2010 www.iasp-pain.org:

Overview – Specialised Pain Management Services are defined by NHS England’s SPS Service Specification D08. It is not the intention that this Pathfinder pathway supplements or replaces any aspect of D08 or the information contained in the NHS England Prescribed Specialised Services Manual and Identification Rules. The following is a guide only as the above documents may be updated from time to time.

Most patients with chronic pain can be well managed in the community or local Specialist Pain Services led by Pain Medicine Consultants with appropriately trained members of the interdisciplinary Pain Management team; these services will be commissioned by the CCGs. However, some patients with more complex chronic pain problems will require management in centres that offer Specialised Pain Management Services.

The aim of the service is to provide patients with persistent disabling pain a service which delivers timely, skilled interventions to reduce or remove the cause(s) of pain and/or to enable patients to manage their pain with psychological and behavioural support that their local secondary pain service or another tertiary service have not been able to achieve. This service specification relates to adults but there are significant overlaps in terms of the tertiary specialisms and in particular in relation to young people and transition.

- Provision of time line.
 - Referral is from Specialist Pain Management Services.
 - Service must comply with achievement of 18 weeks from referral for elective definitive treatment.
 - Urgent referral may be appropriate for certain conditions, such as Trigeminal neuralgia and complex cancer, appropriate pathways will need to be agreed and instigated locally.
- Definition of skills / competencies required
 - Essential Competences
 - Multispecialty and multi disciplinary assessment and management comprising
 - A Specialised Team with service specific competencies
 - Minimum 3 appropriately trained pain specialist consultants (FFPMRCA or equivalent)
 - Minimum of 2 specialist nurses
 - More than 1 WTE Chronic Pain Psychologist
 - More than 1 WTE Chronic Pain Physiotherapists
 - Other team members as appropriate to ensure appropriate interdisciplinary and multi-speciality care for patient needs
 - Proven experience to manage their specific group of specialist patients
- Link to other source of advice
 - Employment services (Box 24)
 - Spinal and Radiology MDT
 - Close working relationships with speciality fields, such as neurosurgery
 - Written Guidance (see refs)
- Entry criteria including necessary investigations / results
 - Patients can be referred to tertiary services from secondary level care pain management consultants or from other clinicians.
 - Normally the patient will have completed a pain management programme but this may not always be appropriate if it clear that a tertiary care is what is required.

- The referral pathway may be agreed more locally to reflect existing services configuration. Details of this local agreement should be appended to the service specification.
- Groups of patients may include (NHS England's SPS Service Specification D08):
 - People in pain where pain is very severe and distressing to patients, carers (including health care professionals), multiple physical and psychological problems, significant psychological disorder, significant social instability, high physical disability/very limited mobility, persistently high service use, interpersonal problems with providers or consistent treatment dissatisfaction, multiple treatment failures.
 - Pain not only in the spine with complex needs
 - Drug abuse and dependency with drugs used for management of their pain
 - Pain related psychological and psychosocial problems that significantly complicate pain symptoms and rehabilitation
 - Severe disability possibly requiring inpatient PMP needs
 - Cancer patients that cannot be managed by palliative care without the input of Specialised Pain Medicine
 - Where treatment also requires a multi speciality approach, or some of the time a fully integrated or "interdisciplinary" team approach. Often this is shared care situation with primary and secondary care that requires a dedicated Specialised Pain Management Service
 - Patients with complex pain and pain-associated disability who require the provision of the gateway to those procedures/ specialised treatments or interventions/very high cost drugs that would not be offered by local clinicians.
- Exit Criteria
 - Previously undiagnosed Pathology
 - Local specialist clinics, community services or patients empowered to manage the condition for referral
- Essential referral information
 - From specialist pain management services
- Patient Assessment
 - Interdisciplinary pain team assessment. An interdisciplinary team is an integrated working group where each clinical individual (which should include access to others such as pharmacists and occupational therapists) has a high level of expertise in different aspects of management of patients with complex pain.
 - Multispecialty pain team assessment. A multispecialty pain team is a team of speciality experts that represent different disciplines involved in the assessment and management of pain, associated illnesses, and consequences for daily functioning
- Shared Decision Making / Patient Choice
 - Self management (Box 5)
 - Specialist Pain Service (Box 16)
 - As this is a service for people with chronic long term conditions, shared care arrangements are a vital part of the care pathway.
 - Specialised Service Providers will establish robust protocol with referring clinicians in order that the services are able to discharge patients appropriately. It is not envisaged that patients will remain in the tertiary service indefinitely but that they will move back to a managed programme/partnership with local services, although they might be reviewed by the tertiary service.

- Interventions
 - Specialised Pain Management Program (PMP) Such cases require individuality of care provision for pain associated with these complicated and often unusual disorders, that is not seen regularly enough in secondary care to develop treatment protocols.
 - Provide in patient support particularly around the management of pain problems of high medical and psychological complexity, and around the use of controlled drugs.
 - Provide psychological and behavioural interventions that support patients and their carers in managing their pain, enabling them to lead more normal lives with reduced disability
 - Treatments involving complex manipulation of medication under consistent supervision in an inpatient setting. This can include opioids.
 - Highly specialised centres may provide dedicated Pain Management Programs for sickle cell disease, facial pain, urogenital pain, hypermobility, children and young people, persistent/refractory angina, and the like.
 - Specialised Drugs
 - Examples would include patients where the local specialist PMC felt that they needed support; possibly, because of co-morbidity complicating medication management, prescribed or illicit drug usage complicating prescription and for opinions around more expensive medications.
 - Specialised interventions
 - Examples would include patients where the local specialist PMC felt that they needed support; possibly, interventions in a patient with complex bio-psycho social needs, e.g. complex or re-do neuro-modulation, Intrathecal Drug Delivery of Ziconatide and others as appropriate
 - Other specific interventional treatment, e.g. may include cordotomy, Intrathecal neurolytic block, coeliac plexus block, and Deep Brain Stimulation
 - Gateway to those procedures/specialised treatments or interventions/very high cost drugs that would not be offered by local clinicians. Patients would require ongoing review. Examples would include neuromodulation and Intrathecal pumps. Providing there is appropriate clinical governance, such services do not have to be provided in a specialised service.

- Measurement point for quality standard and outcome, PROMS.
 - EQ5D, condition specific disability scale, numeric rating scale for pain and patient experience
 - As per Specialised Pain Management Services defined by NHS England's SPS Service Specification D08 Appendix one. These cover 1 NHS Outcomes Framework Domains 1-5.

- Self Management
 - Reduce recurrent inappropriate admissions and other health care services by promoting self management
 - Increase social and physical functioning, promoting return to work and maintaining productivity through employment
 - Promote independence and well being for patients through the provision of structured self-management support, with concomitant benefits of fewer inappropriate medical appointments and readmissions.

- Co-morbidity
 - Mental Health and social issues.
 - Drug addiction
 - Cardiac
 - Diabetes

- Musculoskeletal (other than back pain)
- Obesity
- Neurological
- Respiratory
- Definition satisfactory result
 - Patient reported improvement
 - Patient choice to self manage
 - Patients and their carers supported in managing their pain, enabling them to lead more normal lives with reduced disability
 - Increased social and physical functioning, promoting return to work and maintaining productivity through employment
 - Improved ability of clinicians in managing the pain element of their patients care
 - Reduced recurrent inappropriate admissions and other healthcare services by promoting self management
- Evidence base and its level of evidence.
 - As per Specialised Pain Management Services defined by NHS England's SPS Service Specification D08 and the documents referenced within that; especially those published by The Royal College of Anaesthetists and other Royal Colleges, British Pain Society (including British Pain Society Maps of Medicine Pathways), The International Association for the Study of Pain, and NICE. These may change from time to time.

References

- National Institute for Health and Clinical Excellence (NICE) Guidance is as set out below
 - NICE (October 2008) 'Spinal cord stimulation for chronic pain of neuropathic or ischaemic origin, NICE Technology Appraisal (TA) TA159', this was reviewed in November 2013 and proposal states this will move to the static list of TAs.
 - NICE (2009) Low back pain: Early management of persistent non-specific low back pain. Clinical guideline 88. London:
 - NICE (2009) Management of long-term sickness and incapacity for work. Public Health Guidance 19. London:
 - NICE (2010 and 2013) Neuropathic pain: the pharmacological management of neuropathic pain in adults in non-specialist settings. Clinical Guideline (CG) 173
- Available from the Royal College of Anaesthetists – www.rcoa.ac.uk
 - Royal College of Anaesthetists (November 2010) Best practice in the management of epidural analgesia in the hospital setting
 - Royal College of Anaesthetists (Revised 2009-2011) Guideline for the Provision of Anaesthetic Services
 - Royal College of Anaesthetists (2009) 'Guidance on chronic pain management' chapter 7 Guidelines for the provision of anaesthetic services
 - Royal College of Anaesthetists (2006) 'Raising the standard: a compendium of audit recipes: chronic pain services'
 - Royal College of Anaesthetists (2003) 'Pain management services: good practice'
- Available from Royal College of Physicians
 - Goebel A, Barker C, Turner-Stokes L, Guideline Development Panel. Complex Regional Pain Syndrome in adults: UK guidelines for diagnosis, referral and management in primary and secondary care. London, Royal College of Physicians, May 2012. <http://www.rcplondon.ac.uk/resources/complex-regional-pain-syndrome-guidelines>
- The BPS published 5 Pain Patient Pathway Maps using best evidence where available for the care of pain patients in collaboration with Maps of Medicine. <http://bps.mapofmedicine.com/evidence/bps/index.html> The Pathways are:
 - Primary Assessment and Management. (Focused on community care)

- Spinal pain – low back pain and radicular. (Community and secondary care, leading into specialised care)
- Musculoskeletal non-inflammatory. (Community and secondary care, leading into specialised care)
- Neuropathic Pain. (Community and secondary care, leading into specialised care)
- Available from the International Association for the Study of Pain (IASP)– www.iasp-pain.org:
 - International Association for the Study of Pain (2009) ‘Desirable characteristics for pain Treatment Facilities’
 - Recommendations for Wait-Times for Treatment of Pain
 - IASP Declaration on Torture
 - Recommendations for Pain Treatment Services
 - Canadian Guideline for Safe and Effective Use of Opioids for Chronic Non- Cancer Pain
 - IASP Classification of Chronic Pain
 - Desirable Characteristics of National Pain Strategies 2010
- Available from the Royal College of Paediatrics and Child Health:
 - Commissioning Tertiary and Specialised Services for Children and Young People (2004)

- Provision of time line.
 - Patients should be seen within 2 weeks of referral
- Definitions of skills / competencies required.
 - Essential Competencies:
 - Knowledge and understanding of clinical care pathways for people with back pain and sciatica and have an understanding of interdisciplinary working.
 - Knowledge and understanding of clinical care pathways for people with neurogenic claudication.
 - Formulate working and differential diagnoses and a prognosis.
 - Monitor and re-assess patients whilst under their care.
 - Communicate with patients and involve them in decisions about their care, set goals and objectives of care.
 - Obtain informed consent from the patient, including explaining the options for care, the purpose of procedures, the risks and potential complications.
 - Deliver a range of treatment options that may include advice, self-management, manual therapy, acupuncture, exercise approaches and psychologically informed care.
 - Understand and evaluate the quality of care delivered.
 - Understand and interpret symptoms and signs that may indicate serious pathology (red flags).
 - Advise patients on the appropriate use of pain relief and pain-modifying medications and other pain management strategies.
 - Recognise the need to work within their scope of practice.
 - Essential skills
 - Ability to medical history, orthopaedic and neurological assessment.
 - Ability to undertake a psychosocial assessment of the patient.
 - Ability to identify “red flag” pathologies; co-morbidities; psychosocial barriers (yellow flags) to recovery (including application of stratification tools where appropriate).
 - Ability to select and refer patient to appropriate services.
 - Ability to communicate diagnosis and care plan to patients and colleagues as required.
 - Ability to undertake specific Patient Reported Outcome Measures (PROMs) and understand the significance of these.
 - Advise patient about the signs and symptoms of a developing Cauda Equina syndrome and what actions that they should take (medical emergency).
- Link to other source of advice.
 - Involvement of other health and social care professionals. This may be a dedicated review service e.g. boxes 8, 11, 13 or specific services relevant to pathway
 - Employment services (Box 24)
 - Pain services (Box 16)
 - Radiology
 - Spinal on-call service
 - Spinal surgical service
- Entry criteria.
 - Patients with radicular pain referred from Box (8)
- Exit Criteria.
 - Emergency referral to Spinal Surgery Service if suspected spinal cord compression or cauda equina syndrome (Box 6).

- Urgent referral to Spinal Surgery Service or urgent MRI if suspected tumour or infection (Box 6).
- Severe or progressive motor deficit (e.g. foot drop).
- Essential referral information.
 - Duration, severity and location of leg pain
 - Medical history
 - Current medication
 - Treatment so far including analgesia tried
 - EQ5D & ODI at initial assessment (Box 8)
- Patient assessment.
 - Full patient assessment already performed at assessment (Box 8).
 - History and examination to define manual therapy / conservative therapy.
 - Exclude symptoms of spinal cord compression and cauda equina.
 - Effect of previous treatments.
 - Formulating an understanding of the patient's perceptions of pain, disability, social disability, levels of anxiety/depression, fear/avoidance behaviour and likely improvement.
 - Assessing patient's expectations and beliefs and the impact of their condition on social interactions and work.
 - Goal setting.
- Shared Decision Making / Patient Choice.
 - Discharge if symptoms settle (Box 5) with staged return to work (Box 24) and information on self-care and core therapies.
 - Investigation (Box 19) if symptoms do not improve or worsen with Conservative Therapy
 - If MRI already performed then see Investigation (Box 19) which may be performed by the Initial Assessment Service (Box 8)
 - May need referral to low back pain pathway (Box 9)
 - Patients should be involved in decisions about the care they receive.
- Interventions.
 - Advice and promoting self- management
 - Discuss analgesia and other pain management strategies, ensuring patient has access to prescribing clinician.
 - Provide consistent message to remain active and foster a positive attitude with realistic expectations.
 - Consider treatment options that could include:
 - Acupuncture.
 - Exercise.
 - Physical therapies, including mobilisation and spinal manipulation.
 - Psychologically informed therapy.
 - Some interventions for neurogenic claudication:
 - Wheeled walker, pacing, and frequent sitting/bending.
- Measurement Point for Quality Standard and Outcome, PROMS.
 - EQ5D, ODI, VAS before and at end of treatment
 - PCOMS
- Self Management.
 - Information should be given to patients.
 - Self directed exercise programme
 - Self directed relaxation techniques
 - Self directed return to work

- Self directed return to normal social and leisure activities
- GP or over the counter medication
- Co-morbidity
 - Co-morbidities should be identified and consideration given to how care may need to be modified. Patients should be referred or signposted appropriately.
- Definition of satisfactory result:
 - Clinically significant improvement in PROMs.
 - Return to usual activities (including return to work).
 - Achieving patient specific goals
 - Improved patient self-management
 - High levels of patient satisfaction with care (PCOMs).
 - Number of patients discharged and number referred for further investigation / management
- Evidence base and level of evidence.
 - The management of low back pain and sciatica is currently being under taken by NICE.
 - <http://cks.nice.org.uk/sciatica-lumbar-radiculopathy#!scenariorecommendation>
 - <http://cks.nice.org.uk/sciatica-lumbar-radiculopathy#!diagnosisub>
 - <http://cks.nice.org.uk/sciatica-lumbar-radiculopathy#!supportingevidence1:8>
 - <https://www.supply2health.nhs.uk/AQPResourceCentre/AQPServices/PTP/Pages/BackNeckPain.aspx>
 - Patient experience in adult NHS services: improving the experience of care for people using adult NHS services NICE CG138. <http://www.nice.org.uk/nicemedia/live/13668/58284/58284.pdf>
 - Patient experience in adult services NICE QS15 <http://guidance.nice.org.uk/QS15>
 - The current evidence base for the diagnosis and management of sciatica (lumbar radiculopathy) can be found at <http://cks.nice.org.uk/sciatica-lumbar-radiculopathy#!topicsummary>
 - Related guidance: Neuropathic pain- pharmacological management (CG173). <http://guidance.nice.org.uk/CG173>

- Provision of time line
 - Within 4 weeks for elective MRI (referral to reporting)
 - Within 1 week for urgent patients (red flags)
 - As an emergency where required (Hospitals offering an emergency spinal service)
- Definition of skills / competencies required
 - Ability to report the MRI scan in a way which is easy to comprehend which nerve roots are or may be compressed
 - Ability to perform CT or MRI under general anaesthetic when necessary
 - Ability to normalise degenerative change related to normal aging to minimise the morbidity associated with MRI reports.
- Link to other sources of advice.
 - GP in case sedation required for mild claustrophobia
- Entry criteria.
 - Correctly completed referral
- Exit Criteria
 - Most cardiac pacemakers are not MRI compatible. Many intracranial devices, clips, cochlear implants and intra-spinal stimulators are also not compatible. Some cardiac valves and vascular implants are contraindicated, so all devices have to be individually assessed. This assessment is carried out by the MRI department referring to manufacturers' recommendations and safety lists.
 - There is no evidence to suggest MRI scans pose a risk during pregnancy. However, as a precaution MRI scans are not usually recommended during pregnancy, particularly in the first three months.
- Essential Referral Information.
 - The MRI department should be advised of any patient with an implanted metal device, so that the appropriate safety assessment can be made. The majority of patients with implanted surgical metalwork such as hip or knee replacements, orthopaedic metal plates and screws can safely undergo MRI, though it is often advised that unless clinically urgent, imaging is not carried out in the immediate post operative period. A delay of 6 weeks is considered prudent.
 - Side of radicular pain
 - Location of pain / suspected nerve root involved
 - Previous surgery
 - Suspicion of other pathology e.g. Spondylolysis
- Patient Assessment
 - Assess ability to have and tolerate an MRI scan
- Interventions / Imaging Protocols

- MR imaging of the lumbar spine should be carried out on equipment of sufficient resolution to reliably demonstrate the relevant anatomical structures and pathological processes.
 - The standard protocol includes a sagittal T1 and sagittal T2 weighted image set. (The latter can also be a STIR or Fat saturated T2 weighted image set). A minimal additional requirement is a set of axial T2 weighted images, generally acquired through the lowest 3 levels, adding any additional levels indicated by the clinical features. For example, if high lumbar neural compression is suspected additional axial images are carried out at upper lumbar levels. Many protocols also include an axial T1 weighted image set through the same levels to increase the sensitivity of detection of lateral disc herniation.
 - Computed tomography is an alternative imaging technique and may be used in patients with radicular symptoms in whom MRI is contraindicated. Axial images of the lower three disc spaces are acquired using a soft tissue algorithm and images are displayed using both bone and soft tissue window settings. CT is less sensitive than MRI for the detection of nerve root compression but offers an adequate imaging option when MRI is contraindicated.
 - A system must be in place to ensure unexpected and expected findings are quickly reported back to the referral source with accurate reporting of potential imminent spinal cord or cauda equina compression to guide the referrer on the urgency of onward referral.
 - Facility for image linking of images and report to external spinal services.
- Measurement point for quality standard and outcome
 - Mean wait for MRI from referral to report being sent.
 - % missed reporting of serious spinal pathologies (tumours, fractures etc)
 - Evidence base.
 - Royal College of Radiologists Referral Guidelines
 - <http://nww.irefer.nhs.uk/>
 - www.irefer.scot.nhs.uk/
 - MRI Safety Website www.mrisafety.com

Overview

In patients with suspected lumbar radiculopathy based on history and clinical examination, the MRI report may suggest no nerve root compression, nerve root compression on the opposite side or compression of a nerve root which is not concordant with the clinical findings. It must be emphasised that the information below should only be applied when the requesting clinician has a high index of clinical suspicion that the patient has lumbar radiculopathy.

In a patient with a spinal deformity (scoliosis / spondylolisthesis), consideration should be given to nerve roots which may become compressed in a standing or sitting position as the deformity increases whilst not compressed in a supine (scanning) position.

The MRI and clinical details should be reviewed at the Spinal MDT.

- If the MDT feels there is no nerve root compression, the nerve root compression is too non-concordant with the clinical findings or the only nerve root compression is on the opposite side then surgical management is not an option. Other causes of the symptoms should be excluded and Neurology referral should be considered. Otherwise, referral to Conservative Therapies (Box 18), Pain Management (Box 16) or Discharge / Self Management (Box 5). This will depend on symptom severity, patient choice and patient expectations / goals.
- If the MDT feels there is 'possible' concordant nerve compression or the nerve root compressed may be responsible for the clinical findings then nerve root injection (Box 22) or Surgery (Box 23) may be an option.
- Evidence Base.
 - Kovacs FM, Royuela A, Jensen TS, Estremera A, Amengual G, Muriel A, Galarraga I, Martínez C, Arana E, Sarasibar H, Salgado RM, Abraira V, López O, Campillo C, del Real MT, Zamora J. Agreement in the interpretation of magnetic resonance images of the lumbar spine. *Acta Radiol.* 2009 Jun;50(5):497-506.
 - Jensen MC1, Brant-Zawadzki MN, Obuchowski N, Modic MT, Malkasian D, Ross JS. Magnetic resonance imaging of the lumbar spine in people without back pain. *N Engl J Med.* 1994 Jul 14;331(2):69-73.
 - French SD, Green S, Buchbinder R, Barnes H. Interventions for improving the appropriate use of imaging in people with musculoskeletal conditions <http://onlinelibrary.wiley.com/o/cochrane/clabout/articles/EPOC/frame.html>
 - Kader DF, Wardlaw D, Smith FW. Correlation between the MRI changes in the lumbar multifidus muscles and leg pain. *Clinical Radiology*, 55; 145-149.
 - van der Windt DAWM, Simons E, Riphagen II, Ammendolia C, Verhagen AP, Laslett M, Devillé W, Deyo RA, Bouter LM, de Vet HCW, Aertgeerts B. 2011 <http://summaries.cochrane.org/CD007431/physical-examination-for-the-diagnosis-of-lumbar-radiculopathy-due-to-disc-herniation-in-patients-with-low-back-pain-and-sciatica-a-systematic>
 - SD Boden, DO Davis, TS Dina, NJ Patronas and SW Wiesel Abnormal magnetic-resonance scans of the lumbar spine in asymptomatic subjects. A prospective investigation. *J. Bone Joint Surg. Am.* 72:403-408, 1990.
 - Steffens D, Hancock MJ, Maher CG, Williams C, Jensen TS, Latimer J. Does magnetic resonance imaging predict future low back pain? A systematic review. *Eur J Pain.* 2013 Nov 26. doi: 10.1002/j.1532-2149.2013.00427.x.
 - Jensen TS, Albert HB, Sorensen JS, Manniche C, Leboeuf-Yde C. Magnetic resonance imaging findings as predictors of clinical outcome in patients with sciatica receiving active conservative treatment. *J Manipulative PhysiolTher.* 2007 Feb;30(2):98-108.

Overview

This is where the imaging is supportive of the clinical findings.

The main disorders likely to be identified in the radicular pathway include intervertebral disc prolapse, spinal stenosis and spondylolisthesis. Occasionally red flag conditions will be diagnosed when not clinically suspected.

The imaging will be reviewed by the practitioner responsible for Radiculopathy Assessment and Initial Management (Box 8). This clinician must be familiar with the different terminology used to report nerve or cauda equina compression

- Provision of time line.
 - Within 2 weeks of referral for imaging
- Definition of skills / competencies required
 - Essential competences: In addition to those in Box 3
 - Referral for diagnostics
 - Referral to other services
 - Essential Skills: In addition to those in Box 3
 - Interpretation of spinal radiology images and reports
 - Communication of diagnosis and prognosis
 - Shared decision making
 - Expectation management
- Link to other source of advice: In addition to those in Box 3
 - Radiology
 - Spinal and Radiology MDT
 - Pain Management Services including CPP and psychology (Box 12, 16)
- Entry criteria
 - Imaging for suspected radiculopathy
- Exit Criteria
 - Suspected metastatic spinal cord compression, cauda equina syndrome, or infection.
 - Radiologically confirmed tumour, infection, acute fracture or spinal inflammatory disease.
 - Non-spinal presentation
 - Choice: self management
- Patient Assessment (As box 3)
 - Patient expectations and beliefs
 - Comprehensive neurological examination including long tract signs
 - Medical co-morbidities
- Shared Decision Making / Patient Choice
 - Self management (Box 5)
 - Nerve root block (box 22)
 - Surgical Opinion/surgery (box 23)
 - Conservative Therapy (Box 18)
- Measurement point for quality standard and outcome, PROMS.

- EQ5D and ODI
- Global rating of progress.
- Self Management
 - As box 8
- Co-morbidity
 - As box 8
- Definition satisfactory result
 - Patient reported improvement
 - Successful return to normal activities including work
 - Patient choice to self manage
- Evidence base and its level of evidence.

Overview.

Injection of depot preparations of steroid usually with local anaesthetic has an established value in a variety of acute and chronic pain problems associated with inflammatory, compressive or post-surgical pathology in the lumbosacral spine, where leg pain is the predominant symptom.

- Time Line
 - For severe, non-controllable radicular pain early in the clinical course for symptom control.
 - For treatment of lumbar radicular pain with the aim of avoiding surgery – patient and/or clinician choice.
 - Injections may be repeated once or twice in the long-term management of conditions such as foraminal or central vertebral canal stenosis, especially in the older person, to maintain functionality.
 - Utility of Diagnostic lumbar nerve root injections has not been fully established.
- Definition of skills / competencies required
 - Trained in the procedure and considered competent to perform
 - Able to take informed consent
 - Ability to detect and manage complications
- Link to other sources of advice
 - Spinal surgery service for management of complications
- Entry criteria
 - Clinician and patient agreement for therapeutic injection for moderate or severe intensity lumbosacral radicular pain (compressive or inflammatory).
 - Lack of suitability of alternative treatments e.g.
 - Patient unfit for surgery/poorly defined surgical target
 - Patient unable to tolerate neuropathic pain medications – especially elderly.
 - Informed consent
- Exclusion Criteria
 - Local or systemic infection
 - Substantial therapeutic or constitutional anticoagulation
 - Patient unwilling/lack of cooperation or unable to tolerate procedure
- Exit criteria
 - Successful injection
 - Unable to tolerate injection
 - Initially successful but symptoms returning and patient wants to consider surgery (Box 23)
- Essential referral information
 - Level and side if nerve root block
 - Imaging investigation (usually MRI)
 - Possible confounding factors – previous surgery, problems with previous injections
 - Medication (especially anticoagulation) and allergies (especially contrast agents)
- Shared Decision Making / Patient Choice
 - Self management (Box 5)
 - Surgical Opinion/surgery (box 23)
 - Conservative Therapy (Box 18)
- Interventions

- Interlaminar, transforaminal or caudal epidural
 - Nerve root injection
 - Aseptic conditions and technique
 - Image guided
 - Non-ionic, water soluble contrast
 - Needle and syringe connections conform to national guidelines
 - Facet cyst disruption/aspiration.
 - Combining epidural or nerve root steroid injection therapy with appropriate medication management, physical and psychological therapies will maximise the benefit.
- Measurement point for quality standard and outcome, PROMS.
 - EQ5D, ODI and VAS before and 4-8 weeks after the procedure
 - Number and type of complications including wrong level / side
 - Self Management.
 - Self directed return to normal Employment, occupation, social and other activities Patient information including the Back Book
 - GP or over the counter medication
 - Definition satisfactory result.
 - If for severe early pain
 - length of time with tolerable pain
 - % referred for surgery
 - If as treatment for lumbar radicular pain with the aim of avoiding surgery
 - % avoiding surgery
 - Return to work / occupation
 - Improved EQ5D / Back Specific Disability Score
 - Patient reported improvement / satisfaction
 - Patient choice to self manage
 - Evidence base and its level of evidence.
 - http://bps.mapofmedicine.com/evidence/bps/low_back_and_radicular_pain3.pdf
 - Faculty of Pain Medicine The Royal College of Anaesthetists (RCOA). Recommendations for good practice in the use of epidural injection for the management of pain of spinal origin in adults. London: RCOA; 2010. Available from: <http://www.rcoa.ac.uk/system/files/FPM-EpiduralInjection.pdf>
 - Lewis R, Williams N et al (2011) The clinical effectiveness and cost-effectiveness of management strategies for sciatica: systematic review and economic model. HTA report Vol. 15: No. 39

- Provision of time line:
 - Very severe radicular pain which is not controllable with analgesia or nerve root injection may require early surgery likely to be at the 1-3 week stage
 - Early surgery may also be required if accompanied by major radicular weakness
 - Otherwise, 8-12 weeks if non-tolerable radicular pain
 - Later surgery may occur in patients with symptoms of fluctuating severity
 - .Neurogenic claudication may be six months
- Definition of skills / competencies required.
 - Same as box 8 and:
 - Interpretation of MRI scan
 - Ability to decide the optimal surgical procedure which may include instrumented stabilisation/fusion
 - Ability to discuss the risks and benefits of surgery versus nerve root/epidural injection versus continue conservative management specific to the patient and consider medical co-morbidities and other factors which may influence the risk: benefit ratio.
 - Ability to perform the possible surgical procedures / gain informed consent / manage any complications
 - Availability of operating theatre, equipment including fluoroscopy for level check and access to MRI imaging for any post-operative complications
- Link to other source of advice:
 - Advice regarding cauda equina syndrome
 - Written information on management options: pain management, nerve root injection, surgery
- Entry criteria including necessary investigations / results
 - From Concordant Imaging (Box 21)
 - From conservative Therapy (Box 18) or Pain Management (Box 16) if the patient decided on that initial management from Box 21
 - From Nerve root block / epidural (Box 22)
 - The patient should be willing to consider a surgical option dependant on risk / benefit analysis
- Exclusion criteria
 - Medically to unfit for anaesthetic
 - Patient does not wish to consider surgery
 - Non-concordant imaging (Box 20)
- Exit Criteria
 - Completion of surgery
 - Discharge (Box 5)
 - Pain Management (Box 16)
 - May require further imaging if initially successful then deterioration to ensure no complications – Imaging (Box 19)
- Essential referral information
 - The patient should have had an MRI scan or CT scan if unable to have an MRI scan
 - MRI report and imaging to be available
 - Full medical history and medications to be available
- Patient Assessment – as for box 8:

- History – see above
- Examination – see above
- Assessment of severity of symptoms
 - Ask patient if tolerable, non-tolerable and whether improving, worsening or plateaued
 - Use of Oswestry Disability Index (ODI), VAS scores for leg and back pain, EQ-5D
- Shared Decision Making / Patient Choice.
 - Perform surgery according to Risk / Benefit assessment
 - Pain Management (Box 16)
 - Nerve root block / Epidural (Box 22)
 - Discharge (Box 5)
- Interventions
 - Decompression / Discectomy
 - Decompression / Discectomy + Instrumented fusion may be required if:
 - Instability e.g. spondylolisthesis, spinal deformity
 - Multiple revision surgery
 - Significant back pain accompanying radicular pain with localised degenerative change
- Measurement point for quality standard and outcome, PROMS:
 - Surgical complications
 - EQ5D, ODI, VAS before surgery and at 6 months after surgery
 - PREMS
- Self Management.
 - By this stage, patients should only be considering this option after discussing surgical options.
- Co-morbidity.
 - Cardiac
 - Diabetes
 - Mental Health
 - Musculoskeletal (other than back pain)
 - Obesity
 - Neurological
 - Respiratory
- Definition satisfactory result.
 - Number (and conversion rate %) of patients for surgery
 - Improvement in EQ5D, ODI, VAS at 6 months
 - Satisfactory PREMS
 - Surgical complication rate within normal limits
- Evidence base and its level of evidence.
 - Prolonged conservative care versus early surgery in patients with sciatica caused by lumbar disc herniation: two year results of a randomised controlled trial, WC Peul et al. BMJ 2008
 - Surgical versus non-operative treatment for lumbar disc herniation. JN Weinstein et al. Spine 2008
 - Lewis R, Williams N et al (2011) The clinical effectiveness and cost-effectiveness of management strategies for sciatica: systematic review and economic model. HTA report Vol. 15: No. 39

Overview

- Provision of Timeline
 - Referral to and input from Occupational Health may be taken throughout the pathway.
 - Particularly Boxes 9, 10, 11, 13, 15, 16
- Definition of skills / competencies required. This is a multi-disciplinary team.
 - Essential competences
 - Identification of barriers to early return to work
 - Development of return to work programmes
 - Excellent communication skills.
 - Goal setting
 - Creative problem solving
 - Understanding cooperation, collaboration between workers, employers, GP and Specialist back pain practitioners
 - Knowledge of relevant legislation on disability, human rights, employer's responsibilities etc
 - Knowledge of LBP prevention i.e. activity based rehabilitation, remaining at work to prevent work absenteeism
 - Knowledge of red flags, yellow flags, natural history of back-pain; patient pathway, evidence based recommendations, active rehabilitation programmes and health services resources available to staff and how to access them.
 - Essential Skills
 - Motivation and reassurance
 - Shared decision making
 - Expectation management
- Link to other source of advice
 - Triage Service (Box 9, 11, 13)
 - Pain Management (Box 16)
 - Core Therapies (Box 10)
 - Spine Surgeon (Box 14)
- Entry criteria
 - Significant pain and disability from low back pain causing, or with the potential to cause, loss of time from work or modification of work patterns
- Exit Criteria
 - Not in employment
- Essential referral information
 - History of Back Pain Episode
 - Limitations on activities (bending, lifting etc.)
 - Social and work impact
 - Current pain pharmacology
 - Specific objectives of patient
- Patient Assessment
 - Impact of symptoms on activity/work disability
 - Evaluation and assessment of obstacles to recovery and return to work.

- Physical fitness and psychophysical and psychosocial resources
 - Job demand and potential occupational risk factors-
 - physical demands of job (manual handling, lifting, bending, twisting),
 - job satisfaction, (nature of work, low control over work, monotonous, time -pressure, work relationships, perceived difficulties, patient's own beliefs)
 - Work support available.
 - Patient expectations and beliefs
 - Impact on family and social ability
 - Patient specific objectives
- Shared Decision Making / Patient Choice
 - Understanding of patient objectives
 - Tailoring of aspects of programme
 - Self management (Box 5)
 - Specialist Surgical Opinion (Box 14)
 - Specialist Pain Service (Box 16)
- Interventions
 - Assisting patients with low back pain (LBP) to continue working or facilitating an early return to work
 - Emphasis on returning to work as rapidly as possible, before pain free
 - Modifying work programmes i.e. negotiating
 - modified duties in more severe cases
 - graded/ pacing full return to work with time targets
 - Facilitating work organisation
 - work place adaptations,
 - pace,
 - rotation of work modified duties etc
 - Communication between LBP health practitioners/services and the work place
 - Arrangements for getting specialist advice and psychological support
 - Education of workforce about back-care and early injury reporting
 - Staff Training Programmes
 - Early intervention (2-4 weeks), case- management and direct involvement approaches
 - Provision of health messages consistent with those delivered by health professionals involved in the patients care
 - Staff training programmes to reduce work related back injuries/ accidents
 - correct manual handling (lifting) techniques,
 - DSE assessments,
 - organisational policies,
 - Environmental improvements.
 - Provision of information and educational materials, leaflets etc
 - Measurement point for quality standard and outcome, PROMS.
 - Time to presentation
 - Return to Work or Occupation
 - days off work
 - long term absenteeism
 - loss of employment
 - Self Management
 - Self directed return to normal Employment, occupation,
 - Patient information
 - GP or over the counter medication

- Co-morbidity
 - Cardiac
 - Mental Health
 - Musculoskeletal (other than back pain)
 - Neurological
 - Respiratory

- Definition satisfactory result
 - Return to work / occupation
 - Improved EQ5D / Back Specific Disability Score
 - Patient reported improvement
 - Patient choice to self manage

- Evidence base and its level of evidence.

NHS England, Chairman	Prof Charles Greenough, National Clinical Director for Spinal Disorders
CRG Adult Neurosciences	Mr Paul May, Consultant Neurosurgeon.
CRG Specialised Pain Services	Dr Andrew Baranowski, Consultant in Pain Medicine.
CRG Specialised Spine Surgery	Mr Ashley Cole, Consultant Spine Surgeon
CRG Armed Forces	Dr Jonathan Leach, General Practitioner
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British Acupuncture Council.	Mr Nick Pahl, Chief Executive
British Assn. Spinal Surgeons	Mr Adrian Casey, Consultant Neurosurgeon
British Chiropractic Association	Dr Mark Gurden, Chiropractor
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British Orthopaedic Assn.	Mr Alistair Stirling, Consultant Spinal Surgeon
British Osteopathic Association	Mr Steven Vogel, Osteopath
British Pain Society	Dr William Campbell, Consultant in Pain Medicine.
British Psychological Society	Dr Amanda Williams, Consultant Psychologist
British Scoliosis Society	Mr Ian Nelson, Consultant Spinal Surgeon
British Society of Rheumatology	Dr. David Walsh, Consultant Rheumatologist
Chartered Society of Physiotherapy	Ms Jill Gamlin, Consultant Physiotherapist
Dept. of Health Taskforce	Mrs Elaine Buchanan, Consultant Physiotherapist
Faculty of Pain Medicine	Dr Beverly Collett, Consultant in Pain Medicine
Musculo-Physiotherapist	Mrs Ruth Sephton, Musculoskeletal Physiotherapist
Royal College of Chiropractors	Dr Mark Gurden, Chiropractor
Royal College of Radiologists	Dr. Eugene McNally, Consultant Radiologist
Public Health	Dr Su Sethi, Consultant in Public Health

Royal College of GPs	Dr Martin Johnson.
Sports Medicine	Dr Nigel Jones .
Society for Back Pain Research	Ms Kika Konstantinou, Senior Clinical Lecturer / Spinal Physiotherapy Specialist
Soc. Brit. Neurological Surgeons	Mr Paul May, Consultant Neurosurgeon
UK Spine Societies Board	Prof Jeremy Fairbank, Consultant Spinal Surgeon (Chair)
Combined CCG rep.	Ms Kate Parkin, Associate Director, Sussex Collaborative Delivery Team
NHS Programme of Care Board	Ms Rachel O'Connor, Director (now Mrs Jacquie Kemp)
NHS Specialised Commissioning	Mr David Stockdale, Responsible Commissioner

This functionality appears in boxes 9, 11 and 13 in the low back pain pathway. They will also appear in box 8 in the radicular pathway and will be making the decision concerning concordant and non-concordant images in boxes 20 and 21.

The individual with this functionality will be highly trained, with skills including;

- History and examination
- diagnostic triage (red flags, Radicular pain, Mechanical back pain, Inflammatory disorders etc)
- Ability to request scan
- Ability to interpret scan along side the radiologists report
- Ability to direct treatment
- Understanding and employment of CBT principals
- Psychosocial assessment
- Assessment of medication
- Shared decision making
- Communication
- Expectation management

It is clearly a highly trained individual with some seniority and will be an expensive and limited resource.

The function of this individual is to direct the pathway of care and to provide the continuity that patients have clearly voiced that they would like to see. In some instances that the practitioner might be bypassed but it is to this practitioner that the pathway will return if response is insufficient or concerns are raised about diagnosis or any other matter.

These were recognised as an essential part of the ordinance of audit and governance of the pathway.

Four outcome measures were suggested.

- Back specific disability scale, the Oswestry Disability Index. (ODI) The ODI has International recognition and has been widely used in published research in low back pain.
- The measure of cost effectiveness and cost efficiency, the EQ5D.
- A numeric pain rating scale.
- Measure of patient experience.

1) Red Flags Explanatory Text

Principles for Spinal Surgical emergency and urgent referrals (Red flags) and management

Introduction

Potential threat to life (spinal infection and spinal tumours , usually metastatic, or 40x less commonly primary spinal tumours) and the potential to cause paralysis define the most urgent spinal conditions.

Paralysis may result from extrinsic compression of the spinal cord (above L1) or cauda equina (below L1). Alternatively it may be due to intrinsic loss of neurological function. (Anterior spinal artery thrombosis, Guillain-Barré Syndrome, transverse myelitis, multiple sclerosis, or be mimicked by conditions such as para-neoplastic syndrome or diabetic femoral neuropathy). The history of onset and subsequent evolution of symptoms supported by examination usually indicate the likely cause, but require imaging confirmation before proceeding to further investigation, if necessary, and defining treatment options before discussing these with the patient.

The commonest causes of extrinsic neural compromise are disc prolapse, spinal metastasis, infection with abscess formation or traumatic spinal column injury. More unusual structural causes are osteoporotic fractures, fractures in ankylosing spondylitis or spontaneous epidural haematoma.

Regardless of cause patients often present with similar symptoms and signs; usually a combination of pain in the spine and if accompanied by pressure on the cord or nerve roots, in the distribution of the nerves involved, which if severe may cause alteration of spinal cord or nerve root function. In addition those with spinal metastases or infection may have more generalised symptoms of cancer or infection and corresponding alteration of blood tests. Until the cause is defined it is difficult to predict the subsequent likely evolution of symptoms and what steps may be required to prevent further deterioration. MRI is the optimal mode of imaging to define the probable cause (it may be contraindicated e.g. in those with pacemakers, or aneurysm clips etc. in which event alternative imaging modalities may be required).

It is particularly important to recognise those with extrinsic neurological compromise because timely surgical decompression may prevent avoidable permanent neurological loss. For the individual patient this may cause long term disability. The relative urgency of assessment, investigation and intervention have been listed in both the primary and secondary care sectors

It is also important that if no evidence of extrinsic neural compromise is evident despite symptoms or signs of neurological deficit, prompt or emergency (dependent on degree) referral for neurological opinion should be made.

It is clearly recognised that in the context of the usual very full timetables of spinal surgical services that optimal assessment and organisation of timely investigation and intervention is often very difficult. Accordingly the DH National Spinal Taskforce report (2013) has recommended that Commissioners should fund a clinically trained spinal emergency coordinator for all acute spinal surgical services.

References

- 1) National Spinal taskforce report <http://www.nationalspinaltaskforce.co.uk>.
- 2) Quraishi, N.A. et al, Malpractice litigation and the Spine: NHS perspective on 235 successful claims in England. Spine 2012 21 (Suppl.2),S196-S199,.

Red Flag Appendix 2 Primary care / intermediate care: Timelines for assessment of patients with symptoms and /or signs of neurological compromise of unknown origin (prior to MRI (or other imaging if MRI contraindicated)).

*Please recognise that by definition this can only be regarded as **a guide** and it is imperative that with evolving neurological compromise clear instructions must be given for the type and timing of ongoing neurological assessment and the **action required** if deterioration occurs. The responsible **senior medical staff** should always be informed when patients with new or evolving neurological deficit present and again (depending on their instruction) if there is significant deterioration.*

Columns to the right in grey included to allow primary care to see timelines in secondary care

	Timelines		Indicative Timelines for actions in secondary care
Neurological status	Urgency of referral (primary care) and secondary care assessment	Time to imaging MRI and treatment plan	Time to intervention
Normal with pain only (no neurological compromise and no suspicion of tumour or infection)	Routine	Routine	Routine
Normal with pain and suspicion of tumour or infection (See below)	Urgent – MSCC coordinator	Urgent – MSCC coordinator	Depends on imaging
Minor deficit – no change last 7 days (Stable)	Routine	Routine	Routine
Minor deficit – worse or developed in last 7 days (deteriorating)	Emergency	Emergency	Dependent on imaging
Major deficit	Emergency	Emergency	Dependent on imaging
Sphincter failure	Emergency	Emergency	Dependent on imaging, complete/incomplete, duration of symptoms

Key - neurological deficit

Stable = No change over previous 7 days

Deteriorating = significant alteration of motor power (loss of one or more MRC motor grade) or sphincter function

Minor = Sensory only or minor motor weakness but still able to tiptoe, heel walk and knee-dip. Mobile without aids

Major = Loss of single leg antigravity Tiptoe (TT,) Heel Walk (HW) , SLD (single leg knee dip). Needs walking aids or is unable to mobilise (due to weakness.) Care to be taken if significant risk of instability.

Sphincter Failure - Difficulty in micturition - Insensible incontinence. Painless retention, Faecal incontinence, Perianal paraesthesia/ sensory loss, alteration of anal tone/ contraction

Urgency of referral

Emergency -(E), = same day, no delay admission

Spinal metastases – 1 week Referral to MSCC coordinator (NICE CG75 (2008) MSCC clinical guideline and NICE QSAC(2014) for MSCC)

Urgent (U) Telephone call to on call spinal surgery service and action as advised and either Fax or letter (if locally agreed) denoting urgent (should receive ? 1 /2/52 appointment *ideally* and 2 week imaging with review),

Routine (R) - to achieve 18/52

Red Flag Appendix 3 Spinal Red flag conditions – Secondary / Tertiary care action timelines.

Please recognise this can only be regarded as **a guide**. The responsible **senior medical staff** should always be informed when patients with new or evolving neurological deficit present and again (depending on their instruction) if there is significant deterioration. If there is no imaging evidence of extrinsic neurological compression despite clinical neurological deficit senior staff must be informed and urgent neurological referral should normally be considered.

Specific Conditions	Timelines			Comments
	Time to imaging MRI	Time to treatment plan	Time to intervention	
Osteoporotic Fracture with severe or significant pain at 8 weeks	Urgent	Urgent	Soon/ Urgent dependent on imaging	
Spinal metastases no neurological deficit	Urgent	Urgent	Soon	Discuss with Oncologists
Major motor radiculopathy	Emergency	Emergency I	?Urgent Dependent on duration	See radiculopathy section
MSCC with Neuro Symptoms /signs	Emergency	Emergency	Soon /Urgent Dependent on imaging	See NICE GL 75, QSAC 2014 Discuss with Oncologists
Spinal infection	Emergency	Emergency	Soon/Urgent Dependent on imaging	To obtain cultures whenever possible before Antibiotics
Sphincter failure - incipient or established recent <48 hours	Emergency	Emergency	Emergency	
Sphincter failure Established > 48 hours	Emergency	Emergency	Urgent Dependent on imaging	
Spontaneous epidural haematoma	Emergency	Emergency	Emergency/ Urgent Dependent on neurology	
Ankylosing Spondylitis with new pain	Emergency	Emergency	Emergency/ Urgent Dependent on neurology	Extreme care with positioning

Key - Time to imaging -

Emergency (E) - That day or first in am next day if theatre following day

Urgent (U) - (to allow clinic review within 2/52 if imaging suggests this to be required)

Routine (R) to allow completion of Rx within 18/52

Time to Treatment plan - Emergency - (E) Senior clinician informed immediately and review when imaging available,

Urgent – Post take review or sooner if imaging requires this

Routine - Booked clinic review

Time to intervention (presuming no overriding co morbidities)

Emergency (E)(with level of emergency depending on clinical circumstances and theatre availability (Immediate if required)

Urgent (U) Urgent – that day or if after 2100hrs first on the list next day

Soon (S) next available list

Routine(R) to achieve 18/52

Red Flag Appendix 4 – Interventions

Cauda Equina Syndrome

- Lumbar spinal surgery is usually required for those patients with cauda equina syndrome (usually discogenic). This is performed posteriorly and involves decompression of the nerves and removal of fragments of disc compressing the nerves.

For all other indications / interventions please see Service Specification Complex Spinal Surgery D14. (Extract below)

Key interventions include:

- Image guided biopsy (tumour and infection) - This is often performed by the interventional radiologist under CT guidance but sometimes in theatre by the radiologist or surgeon with image intensifier control
- Neoadjuvant chemotherapy - sometimes some tumours are too large or too close to vital structures to be amenable to surgery initially. It is possible to shrink some of these (typically Ewing's sarcoma and osteosarcoma) with chemotherapy such that become surgically removable

Excision - this may be:

- Extralesional - removal of the tumour with an intact cuff of normal tissue. This is the ideal when attempting a curative resection. Adjuvant local therapy (Beam therapies (Radiotherapy, Intensity modulated radiotherapy (IMRT) or Intensity modulated proton therapy (IMPT)) is probably not necessary.
- Marginal - removal of the tumour with possible but no definite breach of the tumour margin (often possible when attempting to preserve spinal cord function but removing the tumour up to the dural sleeve) Adjuvant local therapy should be considered.
- Intralesional - the tumour has been breached in the course of surgery with a much higher probability of local recurrence. Adjuvant local therapy probably advisable if the tumour is likely to be sensitive.

For Spinal Reconstruction the tumour itself or the amount of tissue it is necessary to remove for tumour clearance may render the spine unstable and painful. There are different routes and techniques to stabilise the spine. These may be used in varying combinations. These include:

- Vertebroplasty – Image guided injection of cement from the back of the spine into the vertebral body to provide internal reinforcement. This may be preceded by balloon correction of deformity (kyphoplasty)
- Pedicle screw stabilisation - Screws are inserted from the back of the spine into the anterior column (vertebral bodies) and connected by rods to provide posterior scaffolding support
- Anterior spinal reconstruction - the destroyed or weakened vertebral body is removed and replaced with cement or purpose designed cages of differing materials depending on the subsequent treatment likely to be required
- Spinal Fusion - all spinal stabilisation techniques are liable to failure unless accompanied by bony healing which is achieved using bone grafts or substitutes to get the bones to join together over the involved levels

Red Flag Appendix 5 Outcome Measures

Standard	Description	Data Specification (if required)
Missed red flags or progressive neurological deficit including Cauda Equina Syndrome		Secondary care providers should report annually the number of cases / nature of missed red flag or progressive neurological deficit including Cauda Equina Syndrome including the pathology missed and the effect of delay.
Establish appropriate pathway for red flags agreed between primary and secondary care to include a regional plan to manage spinal emergencies and red flags in a timely manner.	Imaging investigations should be requested and a regular MDT set up to discuss cases for referral. This should have strong links with the spinal surgery network and should be led by a Spinal Surgeon. Delay can result in chronicity, a worse response to surgery and prolonged time off work.	The service should report: <ol style="list-style-type: none"> 1. Number of patients seen 2. Number of MRI scans performed 3. Number of patients referred to spinal MDT 4. Number of patients referred to spinal surgeon 5. Number undergoing surgery
Established secondary care spinal MDT meeting Spinal Task Force standards.	Include all personnel involved in the provision of spinal services in a Trust.	Number of MDT meetings held Number of patients discussed Meeting minutes taken
Availability of MRI and CT imaging	Emergency Department must have access to daytime MRI and 24/7 CT access. Image Exchange Portal (IEP) must be available. Spinal centres designated to provide emergency spinal services in the network must have 24/7 MRI and CT.	Each CCG should be able to define their pathway of emergency spinal care.
Access to spinal surgeons	Spinal surgeons able to perform the required surgery should be part of the regional spinal network as all cases for surgery (except injections) should be discussed within the setting of a spinal MDT.	All patients having surgical interventions including injections should have Patient Reported Outcome Measures (PROMS) before surgery and at 1 and 2 years after surgery (6 months after injections). These should include either: <ul style="list-style-type: none"> • COMI (Core Outcome Measures Index) or • VAS back, Oswestry Disability Index and EQ-5D. This data along with the surgical procedure and any complications : <ul style="list-style-type: none"> ○ Surgical rate by indication and reasons for

		<ul style="list-style-type: none"> ○ non-intervention ○ Mortality - operative and 30 day ○ Rate of post –operative neurological deterioration ○ Rate of avoidable complications (Wound infection . Failure of construct or fusion) ○ Rate of re-operation <p>should be recorded in one of the spinal databases (<i>British Spine Registry or Spine Tango – See Appendix 5</i>).</p> <p>Analysis of this data will form part of revalidation for the surgeon.</p>
Training and governance of community providers and other AQP	Community and AQP may provide: <ol style="list-style-type: none"> 1. Low intensity CPP 2. Non-specialised spinal surgery 3. Pain management services 	Staff training, revalidation, indemnity, quality of service delivery and collection and reporting of outcome measures must be the same for all providers
Success of spinal surgery	Spinal surgery for Red flag indications	<p>All patients having surgical interventions should have PROMS before surgery and at 1 and 2 years after surgery.</p> <p>These should include either:</p> <ul style="list-style-type: none"> ● COMI (Core Outcome Measures Index) or ● VAS back, Oswestry Disability Index and EQ-5D. ● And a record of urinary and anal sphincter function <p>This data along with the surgical procedure and any complications (see Appendix 4) should be recorded in one of the spinal databases (British Spine Registry or Spine Tango).</p>
British Association of Spine Surgeons audit of suspected Cauda Equina Syndrome (CES)		All hospitals treating CES should complete the audit and submit data for central reporting. The data can be added directly into the British Spine Registry.

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On behalf of the Clinical Group

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