Low back pain

Costing report
Implementing NICE guidance

May 2009
This costing report accompanies the clinical guideline: ‘Low back pain: early management of persistent non-specific low back pain’ (available online at www.nice.org.uk/CG88).

**Issue date:** May 2009

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**This guidance is written in the following context**

This report represents the view of NICE, which was arrived at after careful consideration of the available data and through consulting healthcare professionals. It should be read in conjunction with the NICE guideline. The report and templates are implementation tools and focus on those areas that were considered to have significant impact on resource utilisation.

The cost and activity assessments in the reports are estimates based on a number of assumptions. They provide an indication of the likely impact of the principal recommendations and are not absolute figures. Assumptions used in the report are based on assessment of the national average. Local practice may be different from this, and the template can be amended to reflect local practice to estimate local impact.

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Executive summary

This costing report looks at the resource impact of implementing the NICE guideline ‘Low back pain: early management of persistent non-specific low back pain’ in England.

The costing method adopted is outlined in appendix A; it uses the most accurate data available, was produced in conjunction with key clinicians, and reviewed by clinical and financial professionals.

Supporting implementation

The NICE clinical guideline on low back pain is supported by a range of implementation tools available on our website www.nice.org.uk/CG88 and detailed in the main body of this report.

Significant resource-impact recommendations

Because of the breadth and complexity of the guideline, this report focuses on recommendations that are considered to have the greatest resource impact and therefore require the most additional resources to implement or can potentially generate savings.

The recommendations relating to increased use of the following are likely to require the most additional resources to implement:

- structured exercise programmes
- acupuncture
- manual therapy
- combined physical and psychological treatment programmes.
The recommendations relating to reduced use of the following are most likely to generate cost savings:

- injections of therapeutic substances into the back
- MRI scans
- X-rays
- radiofrequency facet joint denervation.

The guideline will also generate cost savings in other areas. However, it is not possible to accurately predict these savings.

**Total cost impact**

The annual changes in revenue costs arising from fully implementing the guideline are summarised in table 1.

**Table 1 Total cost impact**

Red text denotes negative numbers and therefore a saving.

<table>
<thead>
<tr>
<th>Area costed</th>
<th>National population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise therapy</td>
<td>863</td>
</tr>
<tr>
<td>Acupuncture</td>
<td>24,366</td>
</tr>
<tr>
<td>Manual therapy</td>
<td>15,959</td>
</tr>
<tr>
<td>Combined group physical and psychological treatment programme</td>
<td>10,430</td>
</tr>
<tr>
<td>Total cost increases</td>
<td>51,617</td>
</tr>
<tr>
<td>Combined individual physical and psychological treatment programme</td>
<td>-396</td>
</tr>
<tr>
<td>Reduction in injections into the base of the spine</td>
<td>-33,634</td>
</tr>
<tr>
<td>Reduction in MRIs carried out</td>
<td>-11,821</td>
</tr>
<tr>
<td>Reduction in physical therapies</td>
<td>-1,769</td>
</tr>
<tr>
<td>Reduction in x rays</td>
<td>-1,381</td>
</tr>
<tr>
<td>Reduction in use of Denervation</td>
<td>-2,538</td>
</tr>
<tr>
<td><strong>Total cost savings</strong></td>
<td><strong>-51,540</strong></td>
</tr>
<tr>
<td><strong>Total cost impact</strong></td>
<td><strong>77</strong></td>
</tr>
</tbody>
</table>
Benefits and savings not quantified above

Potential clinical benefits from the implementation of the clinical guideline include reduced intensity of low back pain and a reduction in psychological distress. Both of these have the potential to translate into benefits that will have a quantifiable financial aspect. Examples of such benefits include:

- reduced sickness absence from paid work
- a reduction in the length of time for which people are unable to carry out normal activities
- increased efficiency of physical therapies (see section 3.9).

Treating all types of back pain costs the NHS more than £1000 million per year. In 1998, the direct healthcare costs of all back pain in the UK were estimated at £1623 million – approximately 35% of these costs were related to services provided by the private sector. It is estimated that the costs of care for low back pain exceed £500 million per year in the private sector, with the NHS incurring costs of over £1000 million. Lost production as a result of low back pain costs at least £3500 million per year (Maniadakis and Gray 2000). A reduction in the number of people with low back pain will result in cost savings (e.g. reduction in volume of spinal surgeries); however, it is not possible to accurately quantify the size of these savings. An example of this could be a reduction in the volume of spinal surgeries that are carried out to treat back pain. It is hoped that this will benefit the NHS by saving the direct costs of surgery and by reducing the workload on spinal surgeons.

Local costing template

The costing template produced to support this guideline enables organisations in England, Wales and Northern Ireland to estimate the impact locally and replace variables with ones that depict the current local position. A sample calculation using this template showed that costs of approximately £150 may be incurred for a population of 100,000.
1 Introduction

1.1 Supporting implementation

1.1.1 The NICE clinical guideline on low back pain is supported by the following implementation tools available on our website www.nice.org.uk/CG88:

- costing tools
  - a national costing report; this document
  - a local costing template; a simple spreadsheet that can be used to estimate the local cost of implementation.
- a slide set; key messages for local discussion
- a patient information leaflet
- a factsheet for commissioners
- audit support.

1.1.2 A practical guide to implementation, ‘How to put NICE guidance into practice: a guide to implementation for organisations’, is also available to download from the NICE website. It includes advice on establishing organisational level implementation processes as well as detailed steps for people working to implement different types of guidance on the ground.

1.2 What is the aim of this report?

1.2.1 This report provides estimates of the national cost impact arising from implementation of guidance on low back pain in England. These estimates are based on assumptions made about current practice and predictions of how current practice might change following implementation.

1.2.2 This report aims to help organisations plan for the financial implications of implementing NICE guidance.
1.2.3 This report does not reproduce the NICE clinical guideline on low back pain and should be read in conjunction with it (see www.nice.org.uk/CG88).

1.2.4 The costing template that accompanies this report is designed to help those assessing the resource impact at a local level in England, Wales or Northern Ireland. NICE clinical guidelines are developmental standards in the Department of Health’s document ‘Standards for better health’. The costing template may help inform local action plans demonstrating how implementation of the guideline will be achieved.

1.3 **Epidemiology of low back pain**

1.3.1 Low back pain is a common condition that may affect up to 80% of the UK population over the course of their lifetime. In the majority of people this pain is short-lived; however, a small proportion will develop chronic pain and disability. Information collected on consultation rates in Scotland (Practice Team Information 2003–2007) indicates that the volume of back pain consultations increases with patient age, and that back pain tends to be more common in women (Croft et al. 1998).

1.3.2 The annual number of patients in various age groups consulting in primary care in Scotland because of back pain can be seen in Figure 1.
1.3.3 These figures include people consulting for all types of back pain; however, we have made an adjustment for this in our costing calculations.

1.3.4 At present no reliable and valid classification system exists for most cases of non-specific low back pain. In clinical practice as well as in the literature, non-specific low back pain is usually classified by the duration of the complaints.

1.3.5 No reliable information exists on the incidence of low back pain lasting between 6 weeks and 12 months. To produce the costing tools, we have taken existing information on the volume of consultations in Scotland and extrapolated this to predict patient numbers in England. We have then amended these figures using a number of assumptions in order to estimate patient numbers.

1.3.6 Table 2 shows the percentage of people annually who consult a doctor for the treatment of back pain. In the absence of full and complete information on current patient consulting behaviour in England, we are using this information as a proxy.
1.3.7 We have assumed that each person will attend an average of 1.66 consultations (Maniadakis and Gray 2000), and that half of these consultations are for the treatment of back pain other than low back pain. Of the remainder, we have assumed that 60% of people will get better within 6 weeks of the pain starting. This assumption has been included to ensure that the number of patients who are affected by this guideline is not overestimated.

Table 2 Estimated annual incidence of low back pain lasting more than 6 weeks but less than 52 weeks (based on volume of consultations)

<table>
<thead>
<tr>
<th>Patient group</th>
<th>Total population</th>
<th>Incidence</th>
<th>Affected population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males aged 18–24 years</td>
<td>2,355,071</td>
<td>0.40%</td>
<td>9,364</td>
</tr>
<tr>
<td>Males aged 25–34 years</td>
<td>3,290,908</td>
<td>0.66%</td>
<td>21,577</td>
</tr>
<tr>
<td>Males aged 35–44 years</td>
<td>3,827,403</td>
<td>0.84%</td>
<td>32,169</td>
</tr>
<tr>
<td>Males aged 45–54 years</td>
<td>3,217,360</td>
<td>0.81%</td>
<td>26,010</td>
</tr>
<tr>
<td>Males aged 55–64 years</td>
<td>2,925,946</td>
<td>0.91%</td>
<td>26,587</td>
</tr>
<tr>
<td>Males aged 65–74 years</td>
<td>1,979,861</td>
<td>0.87%</td>
<td>17,241</td>
</tr>
<tr>
<td>Males aged 75 years and over</td>
<td>1,513,284</td>
<td>1.05%</td>
<td>15,931</td>
</tr>
<tr>
<td>Females aged 18–24 years</td>
<td>2,286,964</td>
<td>0.67%</td>
<td>15,215</td>
</tr>
<tr>
<td>Females aged 25–34 years</td>
<td>3,344,734</td>
<td>0.89%</td>
<td>29,861</td>
</tr>
<tr>
<td>Females aged 35–44 years</td>
<td>3,912,563</td>
<td>1.02%</td>
<td>40,078</td>
</tr>
<tr>
<td>Females aged 45–54 years</td>
<td>3,284,338</td>
<td>1.12%</td>
<td>36,800</td>
</tr>
<tr>
<td>Females aged 55–64 years</td>
<td>3,028,146</td>
<td>1.14%</td>
<td>34,623</td>
</tr>
<tr>
<td>Females aged 65–74</td>
<td>2,190,080</td>
<td>1.18%</td>
<td>25,811</td>
</tr>
<tr>
<td>Females aged 75 years and over</td>
<td>2,400,499</td>
<td>1.18%</td>
<td>28,372</td>
</tr>
<tr>
<td>Total</td>
<td>39,557,157</td>
<td>0.91%</td>
<td>359,641</td>
</tr>
</tbody>
</table>

Population source: Community Health Index (CHI) record for Scotland, as at 30 September 2007

1.3.8 As mentioned in 1.3.5, we have made a number of assumptions, which we have discussed with experts, in order to produce likely incidence figures. For these reasons, table 2 should not be quoted as being an official summary of the prevalence of low back pain either for Scotland or England.

1.3.9 Psychosocial factors have been shown to be important in disability related to back pain. Cognitive behavioural interventions can be used to optimise function and improve quality of life.
1.3.10 Fear-avoidance (that is, the avoidance of movements or physical activities because a person fears that the level of pain they are experiencing will get increase) has been shown to be part of the disabling pathway in people with chronic low back pain. Cognitive interventions have been used to reduce fear and uncertainty and to give the person the confidence that their back is robust even if it hurts.

1.4 Models of care

1.4.1 The initial point of contact and diagnosis of low back pain is likely to be in primary care. From here, people can be referred elsewhere (for example, for manual therapy in a local GP surgery or health centre).

1.4.2 If people are given a referral for a more specialised therapy, such as the combined physical and psychological treatment programme, then this may take place within secondary care. The costs of providing these treatments will fall under the responsibilities of local commissioners.

2 Costing methodology

2.1 Process

2.1.1 We use a structured approach for costing clinical guidelines (see appendix A).

2.1.2 Limited accurate and complete information is available on the current methods of treating low back pain. This has led to problems in building a comprehensive bottom-up model for costing (a costing methodology where the unit cost of individual elements and number of units are estimated and added together to provide a total cost). To overcome this limitation, we had to make assumptions in the costing model. We developed these assumptions and tested them for reasonableness with members of the Guideline Development Group (GDG) and key clinical practitioners in the NHS.
2.2 **Scope of the cost-impact analysis**

2.2.1 The guideline offers best practice advice on the care of adults who are suspected of having, or are diagnosed with, low back pain.

2.2.2 The guidance does not cover the following groups:

- Individuals who have low back pain because of specific spinal pathologies, including:
  - conditions with a specific pathology of a mechanical nature (for example, spondylolisthesis, scoliosis or vertebral fracture)
  - conditions of a non-mechanical nature (for example, ankylosing spondylitis or diseases of the viscera)
  - neurological disorders (including cauda equina syndrome)
  - serious spinal pathology (for example, neoplasms, infections or osteoporotic collapse).
- People with radiculopathy and/or nerve root pain (unilateral leg pain worse than the back pain, pain radiating to the foot or toes, numbness and paraesthesia in same distribution, which is associated with motor neurological deficit).
- Children under the age of 18 years.
- People with acute low back pain (less than 6 weeks’ duration).
- People with non-specific low back pain of greater than 12 months’ duration.

Therefore, these issues are outside the scope of the costing work.

2.2.3 Due to the breadth and complexity of the guideline, we worked with the GDG and other professionals to identify the recommendations that would have the most significant resource impact (see table 3). Costing work has focused on these recommendations.
<table>
<thead>
<tr>
<th>High-cost recommendations</th>
<th>Recommendation number</th>
<th>Key priority?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consider offering a structured exercise programme tailored to the person:</td>
<td>1.3.3</td>
<td>✓</td>
</tr>
<tr>
<td>• This should comprise up to a maximum of eight sessions over a period of up to 12 weeks.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Offer a group supervised exercise programme, in a group of up to 10 people.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• A one-to-one supervised exercise programme may be offered if a group programme is not suitable for a particular person.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consider offering a course of acupuncture needling comprising up to a maximum of 10 sessions over a period of up to 12 weeks.</td>
<td>1.6.1</td>
<td>✓</td>
</tr>
<tr>
<td>Consider offering a course of manual therapy, including spinal manipulation, comprising up to a maximum of nine sessions over a period of up to 12 weeks.</td>
<td>1.4.1</td>
<td>✓</td>
</tr>
<tr>
<td>Consider referral for a combined physical and psychological treatment programme, comprising around 100 hours over a maximum of 8 weeks, for people who:</td>
<td>1.7.1</td>
<td>✓</td>
</tr>
<tr>
<td>• have received at least one less intensive treatment and</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• have high disability and/or significant psychological distress.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do not offer injections of therapeutic substances</td>
<td>1.6.2</td>
<td>✓</td>
</tr>
</tbody>
</table>
into the back for non-specific low back pain.

Only offer an MRI scan for non-specific low back pain within the context of a referral for an opinion on spinal fusion.

| 1.1.4 | ✓ |

Do not offer X-ray of the lumbar spine for the management of non-specific low back pain.

| 1.1.2 | ✓ |

Do not refer people for any of the following procedures:
- intradiscal electrothermal therapy (IDET)
- percutaneous intradiscal radiofrequency thermocoagulation (PIRFT)
- radiofrequency facet joint denervation.

| 1.9.4 |

2.2.4 Ten of the recommendations in the guideline have been identified as key priorities for implementation, and seven of these are considered to have significant resource impact.

2.2.5 The recommendations covering information and education are not predicted to have a major resource impact because they can be carried out within primary care without the need for significant additional resources. There may be costs associated with the provision of specialised patient information, but these are unlikely to be significant and should be investigated on a local basis.

2.2.6 The NICE guidance recommends that people with low back pain should stay physically active and exercise. We have not costed this part of the guideline because it is likely to have very little cost impact on the NHS. However, we have costed the recommendation about structured exercise programmes (see section 3.1).
2.2.7 The provision of manual therapy has been classified as being likely to have a significant resource impact, even though it is already being offered as a treatment for low back pain. This is because the number of people receiving manual therapy is predicted to increase and the recommended number of sessions is higher than the current average.

2.2.8 We have limited the consideration of costs and savings to direct costs to the NHS that will arise from implementation. We have not included consequences for the individual, the private sector or the not-for-profit sector. Where applicable, any realisable cost savings arising from a change in practice have been offset against the cost of implementing the change.

2.3 **General assumptions made**

2.3.1 The model is based on annual incidence and population estimates (see table 2).

2.3.2 The estimated future uptake percentages used within this model are based on existing treatment patterns and expert opinion. These are subject to variation, and may vary according to local circumstances.

2.4 **Basis of unit costs**

2.4.1 The way the NHS is funded has undergone reform with the introduction of ‘Payment by results’, based on a national tariff. The national tariff will be applied to all activity for which Healthcare Resource Groups (HRGs) or other appropriate case-mix measures are available. Where a national tariff price or indicative price exists for an activity this has been used as the unit cost; this has then been inflated by the national average market forces factor.
2.4.2 Using these prices ensures that the costs in the report are the cost to the primary care trust (PCT) of commissioning predicted changes in activity at the tariff price, but may not represent the actual cost to individual trusts of delivering the activity.

2.4.3 For new or developing services, where there is no national average unit cost, organisations already undertaking this activity have been asked their current unit cost.
3 Cost of significant resource-impact recommendations

3.1 Structured exercise programmes

Background

3.1.1 The full recommendation says:

- Consider offering a structured exercise programme tailored to the person:
  - This should comprise up to a maximum of eight sessions over a period of up to 12 weeks.
  - Offer a group supervised exercise programme, in a group of up to 10 people.
  - A one-to-one supervised exercise programme may be offered if a group programme is not suitable for a particular person.

3.1.2 All exercise is potentially beneficial for preventing injuries, with aerobic exercise being especially beneficial. Increasing the flexibility and overall strength of the back can minimise the risk of injury, and if an injury does occur the pain experienced is likely to be less.

3.1.3 Leading a healthy and active lifestyle is recommended as one of the best ways to reduce the risk of low back pain. Where people present with low back pain that has lasted more than 6 weeks, they may be offered a structured exercise programme featuring:

- aerobic activity
- movement instruction
- muscle strengthening
- postural control
- stretching.
Assumptions made

3.1.4 Following discussions with experts, we have assumed that 10% of people with low back pain (that has lasted between 6 weeks and 12 months) are currently offered a structured exercise programme, and that this percentage will rise to 20% following implementation of the guideline.

3.1.5 We have assumed that each session lasts for 1 hour, and that each group exercise class is made up of eight people. This is again based on expert opinion.

3.1.6 In reaching a unit cost, we have assumed that this treatment would be provided by a physiotherapist currently employed on the midpoint of band 5 of ‘Agenda for change’. We have also assumed that approximately 75% of their time will be spent directly treating patients, and that all their costs will be allocated across this number of hours.

3.1.7 We have assumed that each person will attend an average of eight classes. This figure is based on expert opinion. The entire calculation is shown in table 4.

Table 4 Average hourly rate for a structured group exercise programme

<table>
<thead>
<tr>
<th>Total direct cost</th>
<th>Total hours in 12 months</th>
<th>Time spent treating patients</th>
<th>Actual working hours</th>
<th>Cost per hour</th>
<th>Number of people per class</th>
<th>Rate per session</th>
</tr>
</thead>
<tbody>
<tr>
<td>£23,824</td>
<td>1547</td>
<td>70%</td>
<td>1083</td>
<td>£22</td>
<td>8</td>
<td>£2.75</td>
</tr>
</tbody>
</table>

Cost summary

3.1.8 The cost summary for implementation of this recommendation is shown in table 5.
Table 5 Cost of provision of structured group exercise programme

<table>
<thead>
<tr>
<th></th>
<th>Uptake</th>
<th>Number of patients</th>
<th>Cost per person per course</th>
<th>Total cost (£000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>10%</td>
<td>35,964</td>
<td>24</td>
<td>863</td>
</tr>
<tr>
<td>Future</td>
<td>20%</td>
<td>71,928</td>
<td>24</td>
<td>1,726</td>
</tr>
<tr>
<td>Change</td>
<td>10%</td>
<td>35,964</td>
<td>0</td>
<td>863</td>
</tr>
</tbody>
</table>

Other considerations

3.1.9 This recommendation is not projected to have the largest cost impact, for two reasons: the unit cost of a course is low (£24), and expert opinion is that people are more likely to choose acupuncture or manual therapy rather than group exercise classes. We have not costed the provision of individual group programmes as the uptake of this option is predicted to be very low.

3.1.10 This costing work only takes into account the direct labour costs required to provide this exercise programme. A suitable environment is required to provide the exercise programme, and these costs should be investigated on a local basis.

3.2 Acupuncture

Background

3.2.1 The full recommendation says:

- Consider offering a course of acupuncture needling comprising up to a maximum of 10 sessions over a period of up to 12 weeks.

3.2.2 Medical acupuncture employs acupuncture needling in the treatment of specific health conditions following diagnosis by conventional methods.

3.2.3 At present, there is no government legislation in the UK covering the accreditation of acupuncture courses. The British Acupuncture
Council Association (BACC) is a private enterprise that sets its own standards for accrediting 3-year academic courses.

Assumptions made

3.2.4 We have assumed that acupuncture is currently available as a treatment option to people with low back pain that has lasted more than 6 weeks but less than 12 months. We have also assumed that the current average duration of treatment is six sessions (based on discussion with experts).

3.2.5 We have assumed current use of acupuncture to be 5% of people who have visited their doctor for low back pain that has lasted longer than 6 weeks but less than 12 months. This is based on discussions with experts and examination of studies (such as Gracey et al. 2002, which looks at the percentage of therapists who currently treat people for low back pain who have completed a postgraduate qualification in acupuncture).

3.2.6 We estimate that the number of acupuncture sessions will increase following implementation of the guideline. The guideline recommends up to a maximum of 10 sessions. However, on the basis of clinical trial results (Macpherson et al. 2003) it has been estimated that the average number of sessions required to treat low back pain is 8.6 per person. Therefore we have assumed that the implementation of the guideline will require an additional 2.6 sessions per person on average.

3.2.7 We have assumed that this treatment will be carried out by the same level of therapist as those who provide the exercise programme. Therefore the hourly rate we have used can be seen in table 4.

Cost summary

3.2.8 The net cost of the provision of acupuncture is summarised in table 6.
### Table 6 Cost of provision of acupuncture

<table>
<thead>
<tr>
<th>Uptake</th>
<th>Number of patients</th>
<th>Number of sessions per course</th>
<th>Cost per session</th>
<th>Total cost (£000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current 5%</td>
<td>17,982</td>
<td>6</td>
<td>£25</td>
<td>2,697</td>
</tr>
<tr>
<td>Future 35%</td>
<td>125,874</td>
<td>8.6</td>
<td>£25</td>
<td>27,063</td>
</tr>
<tr>
<td>Change 30%</td>
<td>107,892</td>
<td>2.6</td>
<td>£0</td>
<td>24,366</td>
</tr>
</tbody>
</table>

### Other considerations

3.2.9 The increased provision of acupuncture will place extra demands on services. Additional staff training may be required in order to ensure that treatment is carried out correctly.

3.2.10 Depending on where this treatment is commissioned from the costs of provision may vary. This should be investigated on a local basis.

3.2.11 A suitable environment is also required in order for acupuncture to be carried out and these costs should be investigated on a local basis.


3.3 Manual therapy

Background

3.3.1 The full recommendation says:

- Consider offering a course of manual therapy, including spinal manipulation, comprising up to a maximum of nine sessions over a period of up to 12 weeks.

3.3.2 Manual therapy is a general term for a clinical approach utilising skilled, specific, hands-on techniques that involve manipulation, massage, and soft tissue and joint mobilisation. The manual therapies reviewed in the NICE clinical guideline were spinal manipulation, spinal mobilisation and massage. Collectively these are all manual therapy.

3.3.3 Mobilisation therapy involves joint movement within the normal range of motion. Massage is manual manipulation or mobilisation of soft tissues. Mobilisation and massage are performed by a wide variety of practitioners.

3.3.4 Manipulation is a low-amplitude, high-velocity movement at the limit of joint range. It can be performed by chiropractors and osteopaths, as well as by doctors and physiotherapists who have undergone specialist postgraduate training in manipulation. Complications resulting from manipulation are rare, but it is important to recognise that specialist training is required.

Assumptions made

3.3.5 We have used a current average number of five sessions for this costing work, based on discussion with experts and examination of the results of the UK back pain, exercise and manipulation (BEAM) study (Brealey 2004).

3.3.6 We estimate that the current percentage of people with low back pain receiving manual therapy is 5%. This is based on discussions
with experts and studies (Li et al. 2001) suggesting that only a small percentage of people are currently receiving the specific type of treatment that is recommended in the guideline.

3.3.7 The hourly rate we have used is based on the market rate for employing an osteopath. This is estimated to be £50 per hour, based on enquiries into market rates. We have also assumed that an osteopath can be expected to see an average of two patients per hour, once initial patient assessments have been carried out.

3.3.8 We have estimated that implementation of the guideline will result in, on average, an additional 1.5 sessions per person. We have used this figure because it reflects the average number of sessions required for manipulation and exercise, as identified in the UK BEAM study (Brealey 2004). We have consulted with experts from the GDG who have confirmed that this figure is suitable for use in the costing tools.

3.3.9 The estimated future uptake of manual therapy of 35% has been reached through discussions with experts on the GDG.

Cost summary

The net cost associated with the provision of manual therapy is summarised in table 7.

<table>
<thead>
<tr>
<th></th>
<th>Cost per session</th>
<th>Number of sessions</th>
<th>% uptake</th>
<th>Number of patients</th>
<th>Cost (£000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>£25</td>
<td>5</td>
<td>5%</td>
<td>35,964</td>
<td>£4,496</td>
</tr>
<tr>
<td>Future</td>
<td>£25</td>
<td>6.5</td>
<td>35%</td>
<td>125,874</td>
<td>£20,455</td>
</tr>
<tr>
<td>Change</td>
<td></td>
<td>1.5</td>
<td>30%</td>
<td>89,910</td>
<td>£15,959</td>
</tr>
</tbody>
</table>

Other considerations

3.3.10 Specialised training is required in order to provide certain types of manual therapy. Physiotherapists who have not previously received this training would be required to attend training courses, which can
cost between £195 and £400 (based on figures from a selection of training providers). Therefore these staff training costs must be considered.

3.3.11 It is also important to note that people who have received this training are able to both work for the NHS and undertake private work. This possible resource constraint should be considered when evaluating the cost implications of the recommendation.

3.3.12 Additional people receiving this treatment are assumed not to be ‘new’ to overall treatment, and it is assumed that they are currently receiving other physical therapies (see section 3.9) that are not included in the guideline. Therefore this therapy will result in some resource redistribution (see section 3.9).

3.3.13 As with the exercise programme and acupuncture, manual therapy requires a suitable environment in which to carry out the treatment. These costs should be investigated on a local basis.

3.4 Combined physical and psychological treatment programmes

Background

3.4.1 The full recommendation says:

- Consider referral for a combined physical and psychological treatment programme, comprising around 100 hours over a maximum of 8 weeks, for people who:
  - have received at least one less intensive treatment and
  - have high disability and/or significant psychological distress.

3.4.2 Evidence suggests (Guzmán et al. 2001) that combined physical and psychological treatment reduces pain when compared with outpatient non-multidisciplinary rehabilitation or usual care.

3.4.3 This treatment can be provided in a group setting or, where this is unsuitable, on an individual basis.
3.4.4 Because of the high cost of providing this treatment, places are extremely limited. The Pain Society estimates that there are approximately 1000 places currently available on combined physical and psychological treatment programmes for low back pain (Waring et al. 2006).

3.4.5 This type of treatment is already available through the NHS. However, the structure of the programmes can vary between providers, with the costs of provision varying accordingly. The guideline recommends up to 100 hours of combined treatment; however, some programmes have experienced success using different amounts of time.

3.4.6 It is difficult to predict what the exact uptake of this treatment is likely to be. This is partly because of a number of treatments are recommended in the guideline for use before the combined programme, and also reflects the current lack of availability of such programmes.

Assumptions made

3.4.7 We have estimated that the current number of treatment places is equivalent to approximately 0.3% of people diagnosed with low back pain. This is based on information from the Pain Society on the number of places available at specialist pain clinics in England.

3.4.8 We have provided separate costing for group and individual combined physical and psychological treatments, because they have different unit costs, and their future use will also vary.

3.4.9 Unit costs have been based on the costs of providing existing programmes. As mentioned in 3.4.5, the programme structure can vary between providers and the unit costs can also vary. We have addressed this variance in the sensitivity analysis section of our costing template.
Cost summary

3.4.10 The net cost of the use of combined physical and psychological treatment programmes is summarised in table 8.

Table 8 Cost of provision of combined physical and psychological treatment programmes

<table>
<thead>
<tr>
<th>Group therapy</th>
<th>Cost per course</th>
<th>% uptake</th>
<th>Number of patients</th>
<th>Cost (£000's)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>£4,000</td>
<td>0.275%</td>
<td>989</td>
<td>£3,956</td>
</tr>
<tr>
<td>Future</td>
<td>£4,000</td>
<td>1.000%</td>
<td>3,596</td>
<td>£14,386</td>
</tr>
<tr>
<td>Change</td>
<td></td>
<td>0.725%</td>
<td>2,607</td>
<td>£10,430</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Individual therapy</th>
<th>Cost per course</th>
<th>% uptake</th>
<th>Number of patients</th>
<th>Cost (£000's)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>£5,500</td>
<td>0.025%</td>
<td>90</td>
<td>£495</td>
</tr>
<tr>
<td>Future</td>
<td>£5,500</td>
<td>0.005%</td>
<td>18</td>
<td>£99</td>
</tr>
<tr>
<td>Change</td>
<td></td>
<td>-0.020%</td>
<td>-72</td>
<td>-£396</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Net Cost / Saving</th>
<th>% uptake</th>
<th>Number of patients</th>
<th>Cost (£000's)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.705%</td>
<td>2,535</td>
<td>£10,034</td>
</tr>
</tbody>
</table>

Other considerations

3.4.11 As with the other physical therapies that are recommended (exercise programmes, acupuncture and manual therapy), these programmes require a suitable environment in which to provide the treatment. These costs should be investigated on a local basis.

3.5 Injections of therapeutic substances into the back

Background

3.5.1 The full recommendation says:

- Do not offer injections of therapeutic substances into the back for non-specific low back pain.
3.5.2 Injections of therapeutic substances into the back are often used to control symptoms. They are also used to allow physical therapy (see section 3.9) to progress by managing the level of pain so that other treatments can be used. Evidence suggests that other therapies are more effective at solving the problem of low back pain.

Assumptions made

3.5.3 We have used Hospital Episode Statistics (HES) data to establish the number of injections currently being carried out in England. To do this we included all injections that have been carried out under a range of primary diagnosis codes that we agreed with experts. These codes are listed in Appendix C. We have also assumed that 95% of these injections will not be carried out after implementation of the guideline.

3.5.4 In order to obtain a unit cost for injections, these procedures were mapped to the appropriate cost category within HRG4 (National Mandatory Tariff 2009/10 Codes AB02Z – AB04Z).

Cost summary

3.5.5 The estimated cost savings from the implementation of this recommendation are shown in table 9.

<table>
<thead>
<tr>
<th>Current number of injections</th>
<th>% reduction in injections</th>
<th>Reduction in injections</th>
<th>Cost per injection</th>
<th>Predicted cost saving (000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>65,564</td>
<td>95%</td>
<td>62,286</td>
<td>£540</td>
<td>£33,634</td>
</tr>
</tbody>
</table>
3.6 **MRI scans**

**Background**

3.6.1 The full recommendation says:

- Only offer an MRI scan for non-specific low back pain within the context of a referral for an opinion on spinal fusion.

**Assumptions made**

3.6.2 Currently no accurate data exist on the number of scans being performed in all stages of care. As a result of this we have worked with experts from the GDG to estimate that 20% of people with low back pain are receiving an MRI scan. 

3.6.3 We have used the national tariff rate (National Mandatory Tariff 2009/10 version 4, code: RA01Z) for the unit cost of £173 to price MRI scans. This rate is for a one-area scan with no contrast.

**Cost summary**

3.6.4 The projected cost savings from this recommendation are shown in table 10.

**Table 10 Cost impact of reduction in MRI scans**

<table>
<thead>
<tr>
<th>Current number of MRI scans</th>
<th>% reduction in MRI scans</th>
<th>Reduction in MRI scans</th>
<th>Cost per MRI scan</th>
<th>Predicted cost saving (£000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>71,928</td>
<td>95%</td>
<td>68,332</td>
<td>£173</td>
<td>£11,821</td>
</tr>
</tbody>
</table>

3.7 **X-rays**

**Background**

3.7.1 The full recommendation says:

- Do not offer X-ray of the lumbar spine for the management of non-specific low back pain.

**Assumptions made**
3.7.2 We have worked with experts to estimate the current use of X-rays, because no definitive data are currently available. Based on their opinions, we have assumed that currently approximately 20% of people with low back pain that has lasted between 6 weeks and 12 months will receive an X-ray. We have also assumed an 80% reduction in the number of X-rays following implementation of the guideline.

3.7.3 The unit price of a single-area X-ray has been taken from the National Tariff (National Mandatory Tariff 2009/10 version 4).

Cost summary
3.7.4 Estimated cost savings from this recommendation are shown in table 11.

Table 11 Cost impact of reduction in X-rays

<table>
<thead>
<tr>
<th>Current number of X-rays</th>
<th>% reduction in X-rays</th>
<th>Reduction in X-rays</th>
<th>Cost per X-ray</th>
<th>Predicted cost saving (£000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>71,928</td>
<td>80%</td>
<td>57,542</td>
<td>£24</td>
<td>£1,381</td>
</tr>
</tbody>
</table>

3.8 Radiofrequency facet joint denervation

Background
3.8.1 The full recommendation says:

- Do not refer people for any of the following procedures:
  - intradiscal electrothermal therapy (IDET)
  - percutaneous intradiscal radiofrequency thermocoagulation (PIRFT)
  - radiofrequency facet joint denervation

Assumptions made
3.8.2 To establish the number of radiofrequency facet joint denervation procedures that are currently being performed in England, we consulted with experts to examine the available HES data.
(2007/2008) for this subject area. We also assumed that 95% of these procedures will not be carried out after implementation of the guideline. We then mapped the relevant procedure codes to the HRG tariff (HRG 4: 2009/10: Codes AB02Z–AB03Z) to establish their relevant unit cost.

Cost summary

3.8.3 Estimated cost savings from this recommendation are shown in table 12.

Table 12 Cost impact of reduction in radiofrequency facet joint denervation

<table>
<thead>
<tr>
<th>Current number of denervation procedures</th>
<th>% reduction in procedures</th>
<th>Reduction in denervation procedures</th>
<th>Cost per procedure</th>
<th>Predicted cost saving (000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,948</td>
<td>95%</td>
<td>4,701</td>
<td>£540</td>
<td>£2,538</td>
</tr>
</tbody>
</table>

Other considerations

3.8.4 The use of radiofrequency facet joint denervation is not the only action included in this recommendation. However, the low numbers of patient currently being treated with intradiscal electrothermal therapy or percutaneous intradiscal radiofrequency thermocoagulation mean that the potential cost savings are too low to include in our costing work.

3.8.5 In order to fully understand the impact of this recommendation at a local level, the costing template should be amended to reflect local circumstances.

3.9 Other physical therapies

Background

3.9.1 A range of physical therapies are currently available on the NHS to treat the symptoms of low back pain. An example of this could be simple physiotherapy without the use of manipulation (which is not
recommended in the guideline). As discussed earlier, the only physical therapies that are being recommended are a structured exercise programme, acupuncture and manual therapy. This means that other physical therapies will not be provided. The costs that would otherwise have been incurred in the provision of these treatments will help to offset costs that occur as a result of implementation of the guideline.

Assumptions made

3.9.2 In order to estimate how many people are currently receiving other forms of physical therapy, we consulted expert opinion. The general consensus was that approximately 80% of people with low back pain would be receiving one of exercise therapy, acupuncture, manual therapy or another form of physical therapy. Based on the percentages we have used above for exercise, acupuncture and manual therapy, we estimate that 55% of people will currently be receiving another physical therapy.

3.9.3 We have also assumed that these therapies are being performed by a physiotherapist employed within ‘Agenda for change’ band 5. This may vary, but it is not possible to quantify this variance.

Cost summary

3.9.4 The estimated cost savings are shown in table 13.

Table 13 Cost impact of reduction in people receiving other physical therapies

<table>
<thead>
<tr>
<th>Number of people currently receiving other physical therapies</th>
<th>% reduction in other physical therapies</th>
<th>Reduction in other physical therapies</th>
<th>Cost per session</th>
<th>Average number of sessions</th>
<th>Average cost per course</th>
<th>Predicted cost saving (£000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>17,693</td>
<td>80%</td>
<td>14,154</td>
<td>£25</td>
<td>£5</td>
<td>£125</td>
<td>£1,769</td>
</tr>
</tbody>
</table>
3.10 Other benefits and savings

3.10.1 The implementation of this guideline is also expected to generate savings through a reduction in the frequency and duration of inpatient stays. Current expenditure on inpatient treatment for low back pain is estimated at over £60 million (based on HES data and average bed day costs). This illustrates the potential size of cost savings.

3.10.2 Because a patient’s first interaction is often with a GP, any reduction in frequency of visits may also provide cost benefits in this area of care.

4 Sensitivity analysis

4.1 Methodology

4.1.1 There are a number of assumptions in the model for which no empirical evidence exists. Because of the limited data, the model developed is based mainly on discussions of typical values and predictions of how things might change as a result of implementing the guidance and is therefore subject to a degree of uncertainty.

4.1.2 As part of discussions with practitioners, we discussed possible minimum and maximum values of variables, and calculated their impact on costs across this range.

4.1.3 Wherever possible we have used the national tariff plus market forces factor to determine cost. We used the variation of costs for the 25th and 75th percentiles from reference costs compared with the reference cost national average as a guide to inform the maximum and minimum range of costs.

4.1.4 It is not possible to arrive at an overall range for total cost because the minimum or maximum of individual lines would not occur simultaneously. We undertook one-way simple sensitivity analysis,
altering each variable independently to identify those that have greatest impact on the calculated total cost.

4.1.5 Appendix B contains a table detailing all variables modified and the key conclusions drawn are discussed below.

4.2 **Impact of sensitivity analysis on costs**

**Increased use of acupuncture**

4.2.1 As shown in appendix B, there is a significant potential variance in the cost of this recommendation. The large number of potential patients means that small increases in percentage uptake will have a significant cost impact.

**Increased number of manual therapy sessions**

4.2.2 The guideline recommends up to nine sessions of manual therapy, which is greater than the current average number of sessions. However, because a *maximum* of nine sessions is recommended, the average number of sessions may be less. The sensitivity analysis shows the potential variance. However, it should be noted that percentage uptake is also subject to variation in addition to the number of sessions.

5 **Impact of guidance for commissioners**

5.1.1 The treatment of low back pain within secondary care is covered within ‘Payment by results’ and will need to be budgeted for appropriately. Any treatment undertaken in primary care is currently outside the scope of Payment by results.

5.1.2 Low back pain costs fall under the programme budgeting category 215X.
6 Conclusion

6.1 Total national cost for England

6.1.1 Using the significant resource-impact recommendations shown in table 3 and the assumptions specified in section 3, we have estimated the annual cost impact of fully implementing the guideline in England to be a cost of £77,477. Table 14 shows the cost impact of each significant resource-impact recommendation.
Table 14 Total national cost impact\textsuperscript{a}
\textsuperscript{a} Red text denotes negative numbers

<table>
<thead>
<tr>
<th>Area costed</th>
<th>National population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise therapy</td>
<td>863</td>
</tr>
<tr>
<td>Acupuncture</td>
<td>24,366</td>
</tr>
<tr>
<td>Manual therapy</td>
<td>15,959</td>
</tr>
<tr>
<td>Combined group physical and psychological treatment programme</td>
<td>10,430</td>
</tr>
<tr>
<td><strong>Total cost increases</strong></td>
<td><strong>51,617</strong></td>
</tr>
<tr>
<td>Combined individual physical and psychological treatment programme</td>
<td>-396</td>
</tr>
<tr>
<td>Reduction in injections into the base of the spine</td>
<td>-33,634</td>
</tr>
<tr>
<td>Reduction in MRIs carried out</td>
<td>-11,821</td>
</tr>
<tr>
<td>Reduction in physical therapies</td>
<td>-1,769</td>
</tr>
<tr>
<td>Reduction in x rays</td>
<td>-1,381</td>
</tr>
<tr>
<td>Reduction in use of Denervation</td>
<td>-2,538</td>
</tr>
<tr>
<td><strong>Total cost savings</strong></td>
<td><strong>-51,540</strong></td>
</tr>
<tr>
<td><strong>Total cost impact</strong></td>
<td><strong>77</strong></td>
</tr>
</tbody>
</table>

6.1.2 We applied reality tests against existing data wherever possible, but this was limited by the availability of detailed data. We consider this assessment to be reasonable, given the limited detailed data regarding diagnosis and treatment paths and the time available. However, the costs presented are estimates and should not be taken as the full cost of implementing the guideline.

6.2 **Next steps**

6.2.1 The local costing template produced to support this guideline enables organisations such as primary care trusts (PCTs) or health boards in Wales and Northern Ireland to estimate the impact locally and replace variables with ones that depict the current local position. A sample calculation using this template showed that a population of 100,000 could expect to incur a cost of approximately
£150. Use this template to calculate the cost of implementing this guidance in your area.
Appendix A. Approach to costing guidelines

Guideline at first consultation stage

1. Identify significant recommendations and population cohorts affected through analysing the clinical pathway
2. Identify key cost drivers – gather information required and research cost behaviour
3. Develop costing model – incorporating sensitivity analysis

Draft national cost-impact report

Determine links between national cost and local implementation

Internal peer review by qualified accountant within NICE

Develop local cost template

Circulate report and template to cost-impact panel and GDG for comments

Update based on feedback and any changes following consultations

Cost-impact review meeting

Final sign off by NICE

Prepare for publication in conjunction with guideline
Appendix B. Results of sensitivity analysis

*Red text denotes negative numbers*

<table>
<thead>
<tr>
<th>Assessment of sensitivity costs to a range of variables</th>
<th>Parameter varied</th>
<th>Baseline value</th>
<th>Minimum value</th>
<th>Maximum value</th>
<th>Baseline costs (£000s)</th>
<th>Minimum costs (£000s)</th>
<th>Maximum costs (£000s)</th>
<th>Change (£000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in cost per course of exercise therapy</td>
<td></td>
<td>£24</td>
<td>£20</td>
<td>£30</td>
<td>863</td>
<td>719</td>
<td>1,079</td>
<td>360</td>
</tr>
<tr>
<td>Additional uptake of acupuncture</td>
<td></td>
<td>12.5%</td>
<td>10.0%</td>
<td>15.0%</td>
<td>24,366</td>
<td>19,493</td>
<td>29,239</td>
<td>9,746</td>
</tr>
<tr>
<td>Increased cost of acupuncture</td>
<td></td>
<td>£25</td>
<td>£15</td>
<td>£40</td>
<td>24,366</td>
<td>14,619</td>
<td>38,985</td>
<td>24,366</td>
</tr>
<tr>
<td>Increase in manual therapy sessions</td>
<td></td>
<td>6.5</td>
<td>5</td>
<td>9</td>
<td>15,959</td>
<td>0</td>
<td>26,074</td>
<td>26,074</td>
</tr>
<tr>
<td>Increase in cost per course of manual therapy</td>
<td></td>
<td>£125</td>
<td>£100</td>
<td>£200</td>
<td>15,959</td>
<td>12,767</td>
<td>25,534</td>
<td>12,767</td>
</tr>
<tr>
<td>Additional uptake of combined physical and psychological treatment programme</td>
<td></td>
<td>0.725%</td>
<td>0.1%</td>
<td>1.00%</td>
<td>10,430</td>
<td>1,439</td>
<td>14,386</td>
<td>12,947</td>
</tr>
<tr>
<td>Reduction in injections into the base of the spine</td>
<td></td>
<td>95%</td>
<td>80%</td>
<td>100%</td>
<td>(33,634)</td>
<td>(28,324)</td>
<td>(35,405)</td>
<td>(7,081)</td>
</tr>
<tr>
<td>Reduction in MRIs carried out</td>
<td></td>
<td>95%</td>
<td>80%</td>
<td>100%</td>
<td>(11,821)</td>
<td>(9,955)</td>
<td>(12,444)</td>
<td>(2,489)</td>
</tr>
<tr>
<td>Reduction in X-rays carried out</td>
<td></td>
<td>80%</td>
<td>60%</td>
<td>100%</td>
<td>(1,381)</td>
<td>(1,036)</td>
<td>(1,726)</td>
<td>(691)</td>
</tr>
</tbody>
</table>
Appendix C: Hospital Episode Statistic Codes

*Injections into the base of the spine*

The following codes were included in order to establish the current volume of injections being carried out:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>M545</td>
<td>G548</td>
<td>M429</td>
<td>D361</td>
<td>M899</td>
<td>C541</td>
<td>K861</td>
<td>C859</td>
<td>M755</td>
<td>M051</td>
</tr>
<tr>
<td>M549</td>
<td>B022</td>
<td>G959</td>
<td>G570</td>
<td>C798</td>
<td>M939</td>
<td>R203</td>
<td>O909</td>
<td>F110</td>
<td>R268</td>
</tr>
<tr>
<td>M478</td>
<td>M179</td>
<td>I739</td>
<td>M707</td>
<td>M484</td>
<td>G821</td>
<td>C701</td>
<td>G552</td>
<td>I252</td>
<td>M241</td>
</tr>
<tr>
<td>M513</td>
<td>M059</td>
<td>M468</td>
<td>C519</td>
<td>J47X</td>
<td>E119</td>
<td>R936</td>
<td>P288</td>
<td>O140</td>
<td>R300</td>
</tr>
<tr>
<td>M479</td>
<td>M402</td>
<td>M869</td>
<td>M064</td>
<td>M879</td>
<td>M950</td>
<td>C721</td>
<td>G978</td>
<td>C482</td>
<td>I713</td>
</tr>
<tr>
<td>M431</td>
<td>M540</td>
<td>M751</td>
<td>G459</td>
<td>K594</td>
<td>N644</td>
<td>K589</td>
<td>M332</td>
<td>O16X</td>
<td>K805</td>
</tr>
<tr>
<td>R69X</td>
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Radiofrequency facet joint denervation

The following codes were included in order to establish the volume of denervation treatments currently being performed: V485

V486

V487

V488

V489
The primary diagnosis codes that we included were:

- Low back pain
- Dorsalgia, unspecified
- Other spondylosis
- Spondylosis, unspecified
- Other specified intervertebral disc degeneration
- Other specified intervertebral disc displacement
- Other
Appendix D. References


Community Health Index (CHI) record, as at 30 September 2007: Source: Practice Team Information (PTI), ISD Scotland, as at 31st March 2009. Available from: www.isdscotland.org/pti


