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Abstract

Background:
Low back pain (LBP) is a major cause of sickness absence and disability in the working population, and the pre-employment examination should insure that worker's state of health is compatible with the requirements of proposed job. This paper summarizes the main recommendations of the good practice guidelines of the French Society of Occupational Medicine for pre-employment examination in workers exposed to manual handling of loads apart from pre-employment test.

Methods:
The recommendations were developed according to the Clinical Practice Guidelines proposed by the French National Health Authority and based on a systematic search of the literature 1990–2012 in several databases. The guidelines were written and reviewed by two multidisciplinary committees. On the basis of the level of evidence in the literature, the proposed guidelines are classified as grade A, B, C or expert consensus.

Results:
The main recommendations of these guidelines are as follows: (1) medical contraindications alone should not exclude employment in a job associated with a low back risk on the basis of a history of “simple” nonspecific LBP; (2) the relevance of examining a previous history of LBP, which is the best predictor of future LBP due to the recurrent nature of LBP.

Conclusions:
These guidelines correspond to a constant concern with prevention of occupational risk. Primarily intended for occupational physicians, they are also intended for general practitioners who carry out pre-employment examinations in many countries and are likely to be increasingly faced with this type of situation because of the combination of increasing work constraints with ageing of the workforce.

Keywords (separated by '-') Pre-employment - Low back risk - Low back pain - Guidelines - Recommendations - Manual handling of loads

Footnote Information

2 **Pre-employment examination for low back risk in workers**
3 **exposed to manual handling of loads: French guidelines**

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8 **Abstract**

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13 requirements of proposed job. This paper summarizes
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18 test.
19 *Methods* The recommendations were developed accord-
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Keywords Pre-employment · Low back risk · 42
Low back pain · Guidelines · Recommendations · 43
Manual handling of loads 44

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45 **Introduction**

46 The pre-employment examination is defined as “the assess-
 47 ment of a job applicant’s capacity to work without risk to
 48 their own or others’ health and safety” (Cox et al. 2000;
 49 Serra et al. 2007). It should ensure that the worker’s state
 50 of health is compatible with the requirements of the pro-
 51 posed job, by taking the worker’s medical and socioeco-
 52 nomic context into account. Pre-employment examinations
 53 may have different aims. On the one hand, pre-employment
 54 examination has a preventive character and serves to pro-
 55 vide information to the employee about the discrepancies
 56 between the work demands and the individual health state.
 57 On the other hand, pre-employment testing is an obligatory
 58 test to be passed by employee as a condition of employ-
 59 ment set by the employer or by regulation. However, the
 60 dilemma with pre-employment examinations is that,
 61 although rejection of job applicants may prevent an occu-
 62 pational disease or injury, it also may mean that the worker
 63 is denied employment. It is thus not possible to be certain
 64 whether screening does more harm than good. According
 65 to the literature, the pre-employment examination may be
 66 useful in specific job conditions, for example in jobs that
 67 have specific health risks (Hulshof et al. 1999), and should
 68 target specific occupational groups to increase their effec-
 69 tiveness (Braddick et al. 1992; Whitaker and Aw 1995).
 70 Both the European and the French regulations do not con-
 71 tain any direct legal requirement of pre-employment test
 72 for suitability of employees that will be exposed to manual
 73 handling of loads.

74 Back disorders are a major cause of sickness absence
 75 and disability in the working population, and they are
 76 therefore a significant economic burden. Both environ-
 77 mental characteristics and individual factors have been
 78 identified as risk factors (Elliott et al. 1999; Macfarlane
 79 et al. 2006; Manchikanti 2000). First, several authors
 80 have demonstrated that jobs requiring heavy manual han-
 81 dling, standing or walking for more than 2 h result in a
 82 higher incidence of low back pain (LBP); (Bakker et al.
 83 2009; da Costa and Vieira 2010; Heneweer et al. 2011;
 84 Hoogendoorn et al. 1999; Kuiper et al. 1999; Lotters et al.
 85 2003; Nelson and Hughes 2009). Additionally, a previous
 86 history of LBP, particularly if associated with sickness
 87 absence of more than a month, or if they have been more
 88 than two previous episodes, or co-morbidity with depres-
 89 sion, has been found to be associated with increased
 90 sickness absence (Johns et al. 1994; Poole 1999; Smed-
 91 ley et al. 1997; Waddell and Burton 2001). Although the
 92 physical demands of work may be a relatively modest fac-
 93 tor in the primary causation of LBP, people who have LBP
 94 do have more difficulty managing physically demanding
 95 work (Müller et al. 1999; Waddell 1998). Consequently,

there is a pragmatic argument that individuals at highest
 risk of LBP should not be placed in jobs that impose the
 greatest physical demand.

The ever-changing work environment, with increasing
 work constraints, combined with ageing of the workforce
 will probably increase the frequency of LBP at work. How-
 ever, refusal of employment on the basis of such judge-
 ments has substantial personal, societal, legal, political and
 ethical implications that should be balanced with the medi-
 cal judgement during the pre-employment evaluation. The
 French Society of Occupational Medicine has therefore
 developed good practice guidelines for the management
 of LBP in workers exposed to manual handling of loads,
 including pre-employment examinations (Roquelaure and
 Petit 2013). We summarise here the main recommendations
 for the pre-employment examination of workers exposed to
 manual handling of loads.

Methods

The guidelines (Roquelaure and Petit 2013) were devel-
 oped according to the Clinical Practice Guidelines method
 proposed by the French National Health Authority (HAS
 2010). The guidelines are based on a systematic search of
 the literature undertaken from January 1990 to March 2012
 in several databases (PubMed, Embase, NIOSHtic-2 and
 Cochrane Library), websites, institutional reports and docu-
 mentation of the main international institutions in charge of
 occupational health. The guidelines were written by a mul-
 tidisciplinary working group of 24 experts and reviewed
 by a multidisciplinary peer review committee of 50
 experts (occupational health physicians, rheumatologists,
 National health insurance consultant physicians, rehabili-
 tation physicians, general practitioners, physiotherapists,
 ergonomists, occupational therapists, occupational nurses,
 regional health inspectors, chiropractors, occupational risk
 epidemiologists and work physiology and ergonomics sci-
 entists). On the basis of the data published in the literature
 and professional opinions, the proposed guidelines are clas-
 sified as grade A, B or C, according to the Oxford grading
 system (Oxford Centre for Evidence-Based Medicine):

AQ2 *Grade A—Established scientific evidence* Based on
 studies with a high level of evidence, such as powerful
 randomized comparative trials with no major bias or meta-
 analysis of randomized comparative trials, decision analy-
 sis based on well-conducted studies.

Grade B—Scientific presumption Based on scientific
 presumption provided by studies with an intermediate level
 of evidence, such as less powerful randomized comparative
 trials, well-conducted non-randomized comparative stud-
 ies, cohort studies.

145 *Grade C—Low level of evidence* Based on studies with a
146 lower level of evidence, such as case–control studies, retro-
147 spective studies, case series, comparative studies with con-
148 siderable bias.

149 *Grade EC—Expert consensus* In the absence of studies,
150 guidelines are based on a consensus between experts of the
151 working party, after consulting the peer review group.

152 Detailed methodological information about search ques-
153 tions, the literature search, reviewing process and the con-
154 sensus process is given in the guideline report (Roquelaure
AQ3 and Petit 2013).

156 Results

157 According to the literature, there is conflicting evidence
158 regarding the effect of a pre-employment examination that
159 included a physical capacity evaluation on LBP among
160 workers that frequently perform lifting tasks. Due to the
161 high rejection rate of candidates, a pre-employment medi-
162 cal examination is not recommended to reduce the risk of
163 LBP (Kuijjer et al. 2014; Mahmud et al. 2010). “In view of
164 the high prevalence of ‘simple’ LBP (i.e. not causing func-
165 tional disability in private life and/or at work) in the gen-
166 eral population, it is not recommended to issue any medical
167 contraindication to hiring for a job associated with a low
168 back risk on the basis of a history of ‘simple’ nonspecific
169 LBP (*Grade EC*)”.

170 Guidelines regarding education and advice

171 In view of the high prevalence of nonspecific LBP in the
172 workforce and the representations or ‘beliefs’ associated
173 with these symptoms, the pre-employment examination
174 also provides a good opportunity to deliver detailed infor-
175 mation appropriate to each worker, especially concerning
176 work-related risks, their prevention and possible medical
177 follow-up.

178 Clinical examinations are a good opportunities to
179 provide workers with valuable information concern-
180 ing the diagnosis, management and prognosis of LBP.
181 This discussion can have direct positive effects, as fears
182 and beliefs may be identified and discussed. It can also
183 help to restore confidence to workers who are some-
184 times confused by contradictory information or medi-
185 cal advice. Moreover, providing information concern-
186 ing low back risk and LBP helps to improve a worker’s
187 understanding and promotes a positive change in work-
188 ers’ representations (fears and beliefs) and inappropriate
189 behaviour (avoidance of movement) related to LBP
190 (*Grade B*).

191 For workers with or without LBP exposed to manual
192 handling of loads, it is recommended that:

- particular attention should be paid to the content of the message delivered by healthcare professionals in view of its potential impact on the worker’s representations and behaviour (*Grade B*);
- the fact that LBP is common and frequently recurrent and that episodes of LBP are usually brief with a spontaneously favourable outcome should be emphasized (*Grade B*);
- the fact that the onset of LBP has a multifactorial origin and that occupational factors are one of the modifiable factors influencing the incidence of LBP should be emphasized (*Grade B*);
- the consistency of the risk prevention messages delivered by the multidisciplinary occupational health team should be ensured because of the negative impact of discordant messages (*Grade EC*).

Guidelines regarding clinical assessment

The recurrent nature of LBP means that previous history (frequency and duration of episodes) is the best predictor of future LBP (Dionne 1999; Elders and Burdorf 2004). The literature identifies other factors that are also likely to be associated with future LBP and absenteeism: i.e. short free interval since the previous episode, sciatica associated with LBP, history of lumbar surgery, prolonged sick leave for LBP.

It is recommended that low back risk in workers with a history of ‘severe’ LBP should be evaluated (i.e. recurrent or chronic LBP and/or LBP causing functional disability in private life and/or at work). This evaluation should include at least:

1. The history of LBP (history, frequency, treatment and consequences), comorbidities and job history (*Grade EC*).
2. Assessment of the risks for the worker’s health by taking into account the risks related to the job, potential job adjustments and socioeconomic context.

In complex medical cases (history of complex spinal surgery, severe comorbidities, etc.), it is recommended that a low back-focused physical examination should be performed and a consultation between the occupational physician and the general practitioner and/or specialist should be organized with the job applicant’s consent (*Grade EC*).

Investigation of an asymptomatic spinal deformity (kyphosis, lordosis, scoliosis) has no particular value for surveillance or job fitness. In contrast, in the presence of serious and/or symptomatic spinal deformities, a specialist opinion should be obtained (*Grade EC*).

Due to the lack of predictive value of imaging on the development of future LBP or disability, it is not

242 recommended that low back imaging be performed at the
243 time of pre-employment health assessment (*Grade A*).
244 These examinations expose job applicants to useless irradi-
245 ation and can lead to rejection based on the state of health,
246 which is ethically and legally unacceptable.

247 Discussion

248 These recommendations are the first occupational guide-
249 lines for the management of work-related LBP in France.
250 They are adapted to the French system of occupational
251 health, which includes occupational health services
252 employing specialized occupational health physicians and
253 nurses. However, they are also intended for the surveil-
254 lance of workers in other European countries and for treat-
255 ing physicians (general practitioners, rheumatologists,
256 rehabilitation physicians, orthopaedic surgeons, etc.) par-
257 ticipating in the management of LBP. These recommenda-
258 tions are based on an extensive literature review and draw
259 on recommendations of previous clinical practice guide-
260 lines related to the assessment and management of LBP at
261 work (INSERM 2000; Mahmud et al. 2010; Waddell and
262 Burton 2001). Few guidelines and systematic reviews have
263 been published concerning pre-employment assessment for
264 low back disorders in the workplace, and this is the reason
265 why many recommendations have been based on low-grade
266 evidence and expert consensus. However, the absence of
267 grading does not mean that the guidelines are not relevant
268 and useful, but indicates the need to conduct further stud-
269 ies. The main recommendations of these guidelines are:
270 (1) medical contraindications alone should not exclude
271 employment in a job associated with a low back risk on the
272 basis of a history of 'simple' nonspecific LBP; (2) the rel-
273 evance of examining a previous history of LBP, which is
274 the best predictor of future LBP due to the recurrent nature
275 of LBP. Psychosocial risk factors have voluntarily not been
276 developed in this part of the recommendations because
277 they are better predictive markers of the risk of develop-
278 ing chronic pain and prolonged incapacity (Henschke et al.
279 2008; Linton 2005; Waddell and Aylward 2010).

280 Pre-employment examination is widely applied in
281 most countries in the world because many employers
282 and other stakeholders believe that health examinations
283 of job applicants can prevent occupational diseases and
284 sickness absences (Mohr et al. 1999; Pachman 2009).
285 Controlling the incidence of work-related diseases is
286 medically important, but it is of far greater importance
287 for individual employees as they can result in life altering
288 consequences for workers who depend on their physical
289 well-being for their livelihood. Most workers who have
290 experienced one episode of LBP do recover, returning to
291 normal function at work and at home, but approximately

10 % of them will develop long-term pain and limitation
of their ability to function at work and at home (Frank
et al. 1998; Nachemson 1996; Waddell 1998). The loss
of the ability to work can have devastating consequences
on not only the injured individual but also his or her
entire family. This small group accounts for the major-
ity of LBP-related disability and the associated costs and
absenteeism in working-age people (Turner et al. 2000;
van Tulder et al. 1995).

There is a fine line between the risk of discrimination
based on health and the regulatory requirement for preven-
tion inherent to occupational health. The pre-employment
examination must ensure that the worker's state of health
is compatible with the requirements of the proposed job
by taking the worker's medical and socioeconomic context
into account. This could be counterbalanced by the argu-
ment that discrimination against candidates at high risk of
above-average absence is justifiable because the employer
has a right to expect employees to attend work regularly
(Poole 1999). Although the physician's duty of care lies
primarily towards the employer (to whom he also has a
contractual obligation), he does ensure that the medical
confidentiality is scrupulously observed. Ideally, a pre-
employment examination should not exclude impaired or
at-risk workers but should strive to fit jobs to their abili-
ties and provide counselling for risk management (Pach-
man 2009). Moreover, for unfit workers, the reasons for
rejection of employment should be made clear, i.e. whether
applicants are not fit to perform the tasks with work restric-
tions or because they are highly susceptible to risks (Sorg-
drager et al. 2004).

Conclusion

Given that the prevalence of LBP in working-age adults
is high and that manual handling of loads is a widespread
activity among workers of many job categories, these
guidelines correspond to a constant concern with preven-
tion of occupational risk. Primarily intended for occupa-
tional physicians, these guidelines are also intended for
general practitioners who carry out pre-employment exami-
nations in many countries and are likely to be increasingly
faced with this type of situation because of the combina-
tion of increasing work constraints with ageing of the
workforce.

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346 **Conflict of interest** The independence and impartiality of the work-
347 ing party and review committee's experts in relation to the topic of the
348 guidelines were verified by an HAS entity devoted to management of
349 conflicts of interest. There was no conflict of interest.

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