

·指南·共识·解读·

中国慢性腰背痛诊疗指南(2024版)

国家卫生健康委能力建设和继续教育中心疼痛病诊疗专项能力提升项目专家组

程志祥¹ 刘先国² 吕岩³ 马柯⁴ 黄东⁵ 刘庆⁶ 杨晓秋⁷ 陆丽娟⁸ 刘堂华⁹ 王林¹⁰ 刘金锋¹¹ 张宝娟¹² 刘延青¹³

¹南京医科大学第二附属医院疼痛科,南京市 210011;²中山大学中山医学院,广州市 510080;³空军军医大学附属西京医院疼痛科,西安市 710032;⁴上海交通大学医学院附属新华医院疼痛科,上海市 200092;⁵中南大学湘雅三医院疼痛科,长沙市 410013;⁶西南医科大学附属医院疼痛科,四川省泸州市 646099;⁷重庆医科大学附属第一医院疼痛科,重庆市 400042;⁸南京大学医学院附属鼓楼医院疼痛科,南京市 210008;⁹中关村中美精准医学科技研究院疼痛病研究所,北京 100081;¹⁰贵州医科大学附属医院疼痛科,贵阳市 550004;¹¹哈尔滨医科大学附属第二医院疼痛科,哈尔滨市 150086;¹²济宁市第一人民医院疼痛科,济宁市 272002;¹³首都医科大学附属北京天坛医院疼痛科,北京 100070

执笔者:程志祥,Email: zhixiangcheng@njmu.edu.cn

所有作者对本文有同等贡献

通信作者:刘延青,Email: lyqytyy@126.com

【摘要】 腰背痛已成为全球致残的首要原因,是一个重大的全球公共卫生问题。为提升腰背痛诊疗服务能力,满足临床诊疗需求,国家卫生健康委能力建设和继续教育中心疼痛病诊疗专项能力提升项目专家组系统检索和评价了国内外近年来发表的慢性腰背痛诊疗循证医学证据,严格论证后制定本指南。

【关键词】 慢性疼痛; 慢性腰背痛; 指南

DOI: 10.3760/cma.j.cn101658-20240215-00017

A Chinese guideline for the diagnosis and treatment of chronic low back pain (2024 edition)

Prepared by the Expert Ggroup of the Special Ability Improving Project for Diagnosis and Treatment of Pain Disease in National Health Commission Capacity Building and Continuing Education Center

Cheng Zhixiang¹, Liu Xianguo², Lyu Yan³, Ma Ke⁴, Huang Dong⁵, Liu Qing⁶, Yang Xiaochu⁷, Lu Lijuan⁸, Liu Tanghua⁹, Wang Lin¹⁰, Liu Jinfeng¹¹, Zhang Baojuan¹², Liu Yanqing¹³

¹Department of Painology, The Second Affiliated Hospital of Nanjing Medical University, Nanjing City, Jiangsu Province 210011, China; ²Zhongshan School of Medicine, Sun Yat-sen University, Guangzhou City, Guangdong Province 510080, China; ³Department of Painology, Xijing Hospital affiliated to Air Force Medical University, Xi'an City, Shaanxi Province 710032, China; ⁴Department of Painology, Xinhua Hospital affiliated to Shanghai Jiao Tong University School of Medicine, Shanghai City 200092, China; ⁵Department of Painology, The Third Xiangya Hospital of Central South University, Changsha City, Hunan Province 410013, China; ⁶Department of Painology, The Affiliated Traditional Chinese Medicine Hospital of Southwest Medical University, Luzhou City, Sichuan Province 646099, China; ⁷Department of Painology, The First Affiliated Hospital of Chongqing Medical University, Chongqing City 400042, China; ⁸Department of Painology, Nanjing Drum Tower Hospital, The Affiliated Hospital of Nanjing University Medical School, Nanjing City, Jiangsu Province 210008, China; ⁹Pain Research Institute of Zhongguancun Zhongmei Precision Medical Technology Research Institute, Beijing City



100081, China; ¹⁰Department of Painology, The Affiliated Hospital of Guizhou Medical University, Guiyang City, Guizhou Province 550004, China; ¹¹Department of Painology, The Second Affiliated Hospital of Harbin Medical University, Harbin City, Heilongjiang Province 150086, China; ¹²Department of Painology, The First People's Hospital of Jining City, Jining City, Shandong Province 272002, China; ¹³Department of Painology, Beijing Tiantan Hospital, Capital Medical University, Beijing City 100070, China

Writer: Cheng Zhixiang, Email: zhixiangcheng@njmu.edu.cn

All authors contributed equally to the article

Corresponding author: Liu Yanqing, Email: lyqytyy@126.com

【Abstract】 Low back pain has become the leading cause of disability worldwide and a major global public health issue. In order to enhance the ability of diagnosis and treatment for low back pain to meet the needs of clinical diagnosis and treatment, the expert group systematically searched and evaluated the evidences from evidence-based medicine on the diagnosis and treatment for the chronic low back pain at home and abroad in recent years, and compiled this guideline.

【Key words】 Chronic pain; Chronic low back pain; Guideline

DOI: 10.3760/cma.j.cn101658-20240215-00017

前言

腰背痛(low back pain, LBP)是全球致残的首要原因,不仅严重影响患者的生活质量,占用巨大的医疗资源,还导致医疗保健成本增加和生产力损失,给个人、家庭和社会带来沉重的负担,甚至造成死亡率增加^[1]。

LBP已成为一个重大的全球公共卫生问题,因而卫生专业技术人员和政策制定者有必要制定相应的政策、措施、规范等,以更好地防治LBP,减轻LBP带来的危害及负担。国内外学术组织、机构或专家团队已经发布了很多针对LBP的专家共识和临床指南,对LBP的规范诊疗起到了积极的推动作用,但尚无从疼痛科专家角度制定的LBP诊疗指南。国家卫生健康委能力建设和继续教育中心疼痛病诊疗专项能力提升项目专家组在前期牵头制定发表的两个LBP专家共识基础上^[2-3],为进一步提升LBP诊疗服务能力,满足临床诊疗需求,组织国内疼痛学科领域的知名专家制定了《中国慢性腰背痛诊疗指南》。

指南制定方法

文献检索时限为2010年1月至2023年12月。中文检索词包括腰背痛、腰痛、下腰痛、背痛、非特异性腰痛、非特异性腰背痛、特异性腰痛、特异性腰背痛等,英文检索词包括back pain, low back pain, non-specific low back pain, specific low back pain等,系统检索了万方、知网、PubMed、Cochrane Library等

国内外知名数据库,主要选择系统评价(systematic review)、Meta分析(Meta analysis)、随机对照试验(randomized controlled trial, RCT)、专家共识(consensus)、临床指南(guideline)等高质量循证医学证据文献,采用推荐分级的评估、制定与评价(Grading of Recommendations Assessment, Development and Evaluation, GRADE)分级系统证据质量分级及推荐强度(表1)^[4-6]和共识会议法,经过多次反复讨论,并进行在线投票,最终制定了本指南。

定义及分类

一、定义

慢性腰背痛(chronic low back pain, cLBP)主要是指病程至少持续12周,低位肋骨边缘以下、臀横纹(水平臀肌折纹)以上及两侧腋中线之间区域发生的疼痛症候群,通常可伴有一侧或双侧下肢的疼痛症状^[7]。

二、分类

cLBP根据病因可分为慢性特异性腰背痛(chronic specific low back pain, cSLBP)和慢性非特异性腰背痛(chronic nonspecific low back pain, cNSLBP)两大类,其中cNSLBP占85%左右。

cSLBP:有明确病因的腰背痛,主要包括脊柱特异性疾病(如感染、肿瘤、骨质疏松、骨折、腰椎间盘突出、腰椎管狭窄、脊柱畸形、强直性脊柱炎等)、神经疾病(如脊髓肿瘤、马尾肿瘤等)、内脏系统疾病(如泌尿系统疾病、妇科疾病等)、血管性疾病(如腹



表1 GRADE 系统证据质量分级及推荐强度说明

级别	说明
证据质量	
高质量(A)	非常有把握:估计值接近真实值
中等质量(B)	对估计值有中等把握:估计值有可能接近真实值,但也有可能差别很大
低质量(C)	对估计值的把握有限:估计值可能与真实值有很大差别
极低质量(D)	对估计值几乎没有把握:估计值与真实值极大可能有很大差别
推荐强度	
强推荐(1)	大部分患者在此种情况下会选择使用推荐方案,只有少数患者不会;大多数医生应该接受干预措施;70%以上专家组成员赞成
弱推荐(2)	大部分患者在此种情况下会选择使用推荐方案,还有很多患者不会;医生亲自仔细查找证据或证据摘要,准备与患者就证据以及他们的价值观和意愿进行讨论;50%~70%专家组成员赞成
没有明确推荐意见(3)	利弊相当;未确定目标人群;制定推荐意见的证据不足;50%以下专家组成员赞成

主动脉夹层动脉瘤等)、心因性疾病(如抑郁症、癔病等)及其他原因6大类^[8]。

cNSLBP:指病因不明的、除脊柱特异性疾病及神经根性疼痛以外原因所引起的cLBP,如小关节源性腰痛、骶髂关节源性腰痛、椎间盘源性腰痛等,本指南主要阐述cNSLBP的诊疗。

流行病学

一、患病率

随着生活和工作方式的改变,cLBP的患病率已超过糖尿病、高血压等疾病。cLBP影响12%~30%成年人^[9],21%~75%的60~102岁老年人^[10],终生患病率为51%~80%^[11]。一项中国居民cLBP流行病学调查显示,中国居民cLBP患病率为31.54%,发病率随年龄增长呈上升趋势^[12]。

二、危险因素

cLBP发生涉及生物力学、社会心理、社会经济、生活方式、工作方式等多个方面^[13],其中工作方式^[14-16]、腰痛病史^[17-18]、女性^[14-16]、超重和肥胖^[14,16]、抑郁症状^[14,19]、年龄^[15-16]、生活方式^[14,20]等是cLBP发生的常见危险因素。

病因及发病机制

一、cSLBP

病因复杂多样,有明显的病理解剖学改变。常见病因包括腰椎间盘突出性变、腰椎小关节病变、骶髂关节病变、腰部肌肉劳损等^[21]。脊柱源性疼痛的病理解剖改变包括椎间盘退变和突出、椎管和椎间孔狭窄等,需要指出的是,这些病理改变与cLBP并没有必然联系,如某些椎间盘突出、椎管狭窄和椎间

孔狭窄患者并没有疼痛症状^[22]。

二、cNSLBP

具体病因尚不明确,且没有显著的病理解剖学改变,可能与下列因素相关。

1. 机械性因素:如脊柱稳定性降低、姿势控制不良等。

2. 炎性因素:与促炎因子和氧化应激作用有关。cNSLBP患者血液中C反应蛋白、白细胞介素-1 β 、白细胞介素-6、肿瘤坏死因子- α 等促炎细胞因子显著升高,白细胞介素-10等抗炎细胞因子显著降低^[23],表明炎症细胞因子与cNSLBP相关^[24],cNSLBP病理改变可能发生在分子水平。

3. 社会心理因素:主要与工作满意度、劳动负荷强度、教育程度等相关。

4. 其他因素:如遗传、大脑结构功能改变等。遗传因素和大脑的改变在cNSLBP发生和发展中起重要作用^[25]。cNSLBP患者大脑结构发生重构,累及的脑区包括背外侧前额叶、海马、丘脑、颞叶、岛叶和初级感觉皮层等,不仅涉及躯体感觉,还涉及认知功能和情感,导致cNSLBP患者记忆减退、抑郁、焦虑等认知功能和情感障碍^[26]。

临床表现(主要指cNSLBP)

一、症状

主要表现为肋缘以下、两侧腋中线之间及臀横纹以上区域的疼痛、不适感,部分伴随着臀部、腿部的疼痛,但不属于放射性疼痛。多数患者可同时存在腰部无力、僵硬感、活动受限或协调性下降。

二、体征

疼痛部位存在肌张力增高或明显局限性压痛点



(扳机点)。临床上检查神经根性体征多为阴性。

三、诱发因素

疼痛症状多于卧床休息后减轻或消失,弯腰、久坐、久站后加重,经保守治疗后疼痛症状多可暂时缓解。

辅助检查

一、影像学检查

如X片、计算机断层扫描(computed tomography, CT)、磁共振成像(magnetic resonance imaging, MRI)、超声、红外热成像、双能X线等检查,根据临床需求选择相应的影像学检查方法,必要时联合多种方法检查,综合评估病情。

二、神经电生理检查

如肌电图、神经传导速度、重复神经电刺激等。

三、实验室检查

如血常规、C反应蛋白、红细胞沉降率(血沉)、免疫学等检查。

诊断和鉴别诊断

详细询问病史和仔细体格检查对cLBP诊断相当关键。特别注意识别有无红旗征、黄旗征危险信号存在,红旗征表明患者有其他严重疾病,需要对其进一步评估(表2),黄旗征是影响疾病发展的危险因素^[22](表3)。

表2 红旗征

患者病史	体征和症状
肿瘤	高热($\geq 38^{\circ}\text{C}$)
身体创伤	休息时或夜间疼痛最严重
高龄: >50 岁(癌症风险)	鞍麻
>70 岁(骨折风险)	下肢无力
体重减轻	膀胱或肠道功能障碍(例如,满
免疫缺陷	溢性尿失禁和尿潴留)
骨质疏松症	步态障碍
用药史	突然不明原因的体重减轻
静脉药物滥用	盗汗
使用皮质类固醇或其他免疫抑制药物	炎性腰背痛

注:红旗征代表可能存在更严重的其他疾病,这些严重疾病往往会引起患者疼痛。患者如果存在任何一项红旗征,那么就需要进一步检查(根据对潜在病理学改变的怀疑),以排除可能存在的严重疾病,如感染、癌症等;也代表该疾病很可能与cLBP有关,要注意筛查与鉴别

一、cNSLBP诊断标准^[27]

1. 腰部、臀后部、股前后及髋部等部位疼痛,活动、久坐、久站后加重,症状反复发作,时间 >12 周。

表3 黄旗征

严重的疼痛和残疾	社会经济地位
睡眠问题	与一般健康方式相关(例如,阿片类药物使用和久坐不动的生活方式)
抑郁症	恐惧回避感
焦虑症	易怒
疼痛恶化	不健康人际关系
工作不满意	对自己生活的控制感降低
社会支持差	

注:黄旗征是影响cLBP病情变化及预后的因素,可协助预测疼痛持续时间、是否转化为慢性的趋势、功能障碍的程度、能否恢复工作及复发风险等

2. 可见腰部局限性压痛点,直腿抬高试验阴性、无神经根性体征。

3. 腰部X线和CT检查均无异常,MRI检查正常或腰椎间盘突出征和/或纤维环后缘高信号区(high-intensity zone, HIZ)、Modic征。

二、cNSLBP鉴别诊断

常见cNSLBP鉴别诊断要点(表4)。

临床评估

临床评估一方面可以协助医生制定个体化治疗方案,另一方面可以评价治疗效果,调整优化治疗方案,也有助于判断预后。如果治疗效果差,需重新考虑是否存在其他病因。

一、疼痛评估

应用视觉模拟评分量表(visual analogue scale, VAS)、数字评定量表(numerical rating scale, NRS)、简明疼痛评估量表(brief pain inventory, BPI)等量表进行cLBP的疼痛评估。

二、功能障碍评估

应用Oswestry残疾指数(Oswestry disability index, ODI)、Roland-Morris功能障碍调查表(Roland-Morris disability questionnaire, RMDQ)、日本骨科协会(Japanese orthopaedic association, JOA)评估治疗评分等量表进行功能障碍评估。

三、生活质量评估

应用SF-36健康调查量表、欧洲五维健康量表(EuroQOL five-dimensions questionnaire, EQ-5D)等进行生活质量评估。

四、心理健康评估

应用抑郁焦虑压力量表、抑郁-焦虑-压力量表DASS-21、Beck抑郁量表(Beck depression inventory, BDI)、恐惧-回避信念问卷(fear-avoidance belief



表4 常见cNSLBP鉴别诊断要点

cNSLBP	部位	疼痛性质	加重因素	缓解因素	查体	特点	感觉异常	辅助检查	诊断
腰椎间盘突出	腰痛为主要表现,也可见臀部、腹股沟区、髋部、大腿前后侧疼痛,偶有膝以下的疼痛	酸痛、胀痛、钝痛为主	久坐、久站、久行、劳累、受凉	久卧位休息后可缓解	一般无棘突、椎旁压痛。神经根牵拉试验常为阴性	腰臀部及大腿疼痛与神经根定位不符。不伴有下肢放射痛和神经根性体征	有皮肤感觉异常	MRI特异性征象:①黑盘征,椎间盘脱水退变;②HIZ征,椎间盘后缘纤维环出现高信号区,阳性率90%;③Schmorl结节, L ₄ 居多;④Modic征,20%~50%的患者存在CT、X线检查	①腰臀部及大腿疼痛与神经根定位不符,疼痛持续时间>6个月,经>4个月的保守治疗无效;②影像学检查提示无明显神经根受压、无节段性不稳征象以及无其他明确导致腰痛的腰椎疾病;③椎间盘退变影像学检查提示阳性,诱发痛者再行椎间盘造影诱发痛试验有1个阴性对照椎间盘
小关节紊乱综合征	腰部、髋及臀部为主,很少出现膝关节以下疼痛	痉挛性疼痛	晨起和翻身时疼痛加剧	活动后可减轻	腰椎旁肌肉紧张僵硬,腰椎棘突旁肿胀、压迫,小关节局部压痛阳性	一般认为小关节痛属牵涉痛,与神经根的刺激和压迫无关	一般无	腰椎侧位X线片:发现腰椎间盘角、腰骶角和腰椎角均有增大小关节造影:大多可见关节囊松弛的改变CT扫描多无阳性所见	小关节阻滞:注射后疼痛缓解或消失即可证实诊断小关节造影阳性是金标准CT检查可排除其他疾病
骶髂关节炎	难以定位的臀部或骶髂区深部钝痛。骶髂关节有广泛的神经支配,临床上表现为多种疼痛形式,如腰和骶髂区疼痛、臀区疼痛、大腿近端疼痛及腹股沟区疼痛	钝痛	长时间睡觉,久坐、久卧、运动、负重,也可受天气变化、受潮、受寒等诱发或加重	活动后缓解	挤压、叩击或旋转骶髂关节会引起疼痛	开始可为单侧或间歇性,以后逐渐变为持续性、双侧受累,伴腰部僵硬和疼痛。常有<3min的晨僵	无	X线平片上显示骶髂关节退变,以增生及骨刺为主CT:骶髂关节处骨刺形成、增生硬化、关节内可见空气征活动性骶髂关节炎:MRI上软骨下骨中明确存在骨髓水肿	详细的病史、既往病史、全面的体格检查以及进一步的影像学检查
腰背肌筋膜疼痛综合征	腰背皮下组织、肌肉及关节有部位不明显的区域性酸痛。肌腱的附着点或肌腹上有固定疼痛区及压痛点	多为弥漫性钝痛。天气变化、阴雨、劳累后加重	疼痛常与天气变化、阴雨、劳累有关,阴雨天及劳累后症状加重	伸展肌肉或痛点注射药物可缓解	受累肌肉触诊紧张带状态	局限性软组织压痛,按压痛点引发肌远端放射痛;触诊局部压痛点可触及过度刺激的结节	有时候仅感觉异常或麻木,而不是疼痛	X线平片、CT、MRI、肌电图及超声检查通常用于排除肌筋膜疼痛的其他原因红外热成像检查对本综合征的诊断有一定参考意义	详细的病史、全面的体格检查以及进一步的影像学检查有助于临床诊断金标准:除外其他病因后,用局麻药痛点注射,疼痛消失即可明确诊断

注:cNSLBP为慢性非特异性腰背痛

questionnaire, FABQ)等进行心理健康评估,以综合评估病情。

五、表面肌电图(surface electromyography, sEMG)

sEMG是通过表面电极将中枢神经系统支配肌肉活动时伴随的生物电信号,从运动肌表面引导记录并加以分析,对神经肌肉功能状态和活动水平作出评价。

六、疗效评价标准

疗效评价标准^[28-29]见表5。

治 疗

治疗目的是缓解疼痛、减少残疾、恢复功能、避免复发。cSLBP首先应针对病因进行治疗,本指南主要介绍cNSLBP的治疗。cLBP治疗方法主要有一般治疗、物理治疗、中医治疗、药物治疗、心理治疗、数字医疗、微创介入治疗及手术治疗。缓解疼痛是患者选择治疗的最重要因素^[30],非手术治疗是大多数患者的一线选择^[31]。



表5 疗效评价标准

指标	小幅度效果	中度效果	高度效果
疼痛	干预后组间效果有差异,100分制VAS改善达到5~10分,或标准化均数差为0.2~0.5	干预后组间效果有差异,100分制VAS改善达到10~20分,或标准化均数差为0.5~0.8	干预后组间效果有差异,100分制VAS改善大于20分,或标准化均数差大于0.8
功能障碍	干预后组间效果有差异,ODI改善达到5~10分,RMDQ改善达到1~2分,或标准化均数差为0.2~0.5	干预后组间效果有差异,ODI改善达到10~20分,或RMDQ改善达到2~5分,或标准化均数差为0.5~0.8	干预后组间效果有差异,ODI改善大于20分,或RMDQ改善大于5分,或标准化均数差大于0.8

注:VAS为视觉模拟评分;ODI为Oswestry 残疾指数;RMDQ为Roland-Morris 功能障碍调查表

一、一般治疗

一般治疗是cLBP的基础治疗,包括健康教育、自我管理(表6)。

表6 一般治疗循证医学证据质量分级及推荐强度

治疗方法	证据等级	推荐强度
健康教育	A	1
自我管理	A	1

1. 健康教育

健康教育主要指通过各种方式,使得医患双方形成关于cLBP的诊断、治疗、预防等全面、客观的正确观点,如cLBP的发病率、与生活方式的密切相关性、适度运动的益处等,这不仅可以帮助个人更好地做出健康选择,也可促进专业人员更有效地参与循证实践,从社会层面促进人口健康的方案制定^[32]。

患者强烈希望获得与医疗保健和职业问题相关的有关预后、治疗方案和自我管理策略的清晰、一致和个性化的信息^[33]。个性化教育能够有效帮助缓解cLBP患者的症状,减少日常生活残疾,提高背部肌肉力量^[34],进行完整的cLBP健康教育可行而且必要^[35]。

虽然健康教育本身就有一定的疗效^[36],但在常规治疗过程中融入健康教育,可提高患者的治疗效果^[37-38]。

2. 自我管理

自我管理是cLBP治疗的核心组成部分,各种临床指南一致推荐自我管理^[39]。多指针对cLBP患者生活方式的调整和改变,特别是基于健康教育内容进行针对性的自我管理,涉及饮食、运动、情绪管理、医疗辅助等多个方面^[3]。健康教育和自我管理二者相辅相成,在cLBP的全程管理中起到积极的作用。采用基于网络的数字化自我管理措施,可有效降低疼痛强度、残疾、恐惧回避和疼痛灾难化^[40]。自我管理与其他治疗方法联合,可提高临床疗效^[41]。

二、物理治疗

1. 物理因子治疗

物理因子治疗是指应用人工或天然的物理因子(光、电、声、磁、热、冷等)作用于人体,进行疾病防治的方法,已经广泛应用于cLBP的临床治疗(表7)。目前临床上常用的体外冲击波疗法(extracorporeal shockwave therapy, ESWT)可分为发散式体外冲击波疗法(radial extracorporeal shockwave therapy, rESWT)和聚焦式体外冲击波疗法(focused extracorporeal shockwave therapy, fESWT),前者有气压弹道式ESWT等,后者有压电式ESWT等。ESWT对cLBP疗效显著,有时可即时显效。不同物理因子治疗的组合,可提高临床疗效,如激光磁等。

表7 常见物理因子治疗循证医学证据质量分级及推荐强度

类型	治疗方法	证据等级	推荐强度
光疗	高能量激光治疗 ^[42-43]	A	1
	低能量激光治疗 ^[44-45]	B	2
电疗	经皮神经电刺激疗法 ^[46-48]	A	2
	干扰电流 ^[49-50]	A	2
声疗	治疗性超声 ^[51-52]	A	3
磁疗	脉冲电磁场 ^[53-54]	A	2
热疗	温泉水疗 ^[55]	A	2
冲击波疗法	ESWT ^[56-59]	A	1
机械按摩	深层肌肉刺激仪 ^[60-61]	B	2

注:ESWT为体外冲击波疗法

2. 运动疗法

运动疗法的目标是减轻疼痛、改善功能、提高生活质量^[62]。运动疗法作为一种简单且无创的治疗方法,已被广泛用于治疗cLBP^[63-64](表8)。常见的运动疗法有普拉提、瑜伽、有氧训练、水上运动、运动控制练习、阻力训练、吊带练习、中国传统运动、步行等^[65]。鼓励患者进行自己喜欢的运动,以提高依从性^[66]。普拉提、麦肯基疗法和功能重建在减轻疼痛强度和功能限制方面比其他类型的运动疗法更有



表8 常见运动疗法循证医学证据质量分级及推荐强度

治疗方法	证据等级	推荐强度
普拉提 ^[66-72]	A	1
麦肯基疗法 ^[66, 73-74]	A	1
瑜伽 ^[75-78]	B	2
肌内效贴 ^[79-82]	B	2
阻力训练 ^[83-84]	A	2
步行 ^[85-86]	B	2
盆底肌肉强化运动 ^[87-88]	B	2
悬吊运动疗法 ^[89-90]	B	3
核心稳定性训练 ^[91-92]	A	2
呼吸训练 ^[93-94]	B	2

效^[66]。减轻疼痛最有效的干预措施是普拉提、身心锻炼和基于核心肌肉的锻炼,减少残疾的最有效干预措施是普拉提、力量训练和基于核心肌肉的锻炼^[67]。

三、中医治疗

cLBP中医治疗主要有中医外治法(针刺、拔罐、艾灸、熏蒸、刮痧、推拿、正骨、针刀、内热针、银质针等)和中医内治法(草药和中成药)(表9),中成药将在药物治疗部分详细介绍。临床上还有一些中西医结合的治疗方法,比如红外光灸等,都有很好的治疗效果。

表9 常见中医疗法循证医学证据质量分级及推荐强度

治疗方法	证据等级	推荐强度
针灸疗法/干针疗法 ^[95-99]	A	1
银质针 ^[100-101]	A	1
内热针 ^[102-103]	B	1
拔罐疗法 ^[104-106]	A	2
艾灸 ^[107-108]	B	2
太极拳 ^[109-111]	B	2
推拿、按摩 ^[112-113]	B	2
正骨、手法 ^[114-115]	B	2
中药复方 ^[116]	B	2
中医汤剂 ^[117]	B	2
穴位按压 ^[118]	B	2
穴位注射 ^[119]	B	3

四、药物治疗

药物是cLBP治疗的一种主要治疗手段,也是最常推荐的治疗方法。应用于cLBP治疗的药物主要有非甾体抗炎药(nonsteroidal anti-inflammatory drugs, NSAIDs)、对乙酰氨基酚、肌肉松弛药、抗抑郁药、抗惊厥药、曲马多、阿片类药物、中成药等(表

10)。NSAIDs和度洛西汀可改善cLBP患者的疼痛和残疾水平^[120]。

表10 常用治疗cLBP药物循证医学证据质量分级及推荐强度

药物类型	药物名称	证据等级	推荐强度
NSAIDs	NSAIDs ^[121-123]	A	1
对乙酰氨基酚	对乙酰氨基酚 ^[121]	B	2
肌肉松弛药	替扎尼定 ^[134-136]	A	1
	乙哌立松 ^[134-135]	B	2
抗抑郁药	度洛西汀 ^[64, 124, 137-139]	A	1
阿片类药物 ^[122, 140-141]	羟吗啡酮 ^[142]	B	2
	他喷他多 ^[143-144]	B	2
	羟考酮 ^[143, 145]	B	2
	丁丙诺啡 ^[146-147]	B	3
曲马多-对乙酰氨基酚合剂	氨酚曲马多 ^[131]	A	1
抗惊厥药	加巴喷丁 ^[148-149]	B	2
	普瑞巴林 ^[148-149]	A	2
汉防己甲素	汉防己甲素片 ^[150-151]	B	2
中成药	痹祺胶囊 ^[152]	A	1
	腰肾膏 ^[153]	B	2
	仙灵骨葆胶囊 ^[153-155]	A	1
	风湿骨痛胶囊 ^[153, 156]	A	1
	通络祛痛膏 ^[157]	B	2
	祛风骨痛凝胶膏 ^[158-159]	B	1
	丹鹿通督片 ^[160-161]	B	1
	盘龙七片 ^[162-163]	B	2
	活血止痛软胶囊 ^[164]	A	1
	骨通贴膏 ^[153, 165]	B	2

注:cLBP为慢性腰痛;NSAIDs为非甾体抗炎药

NSAIDs是治疗cLBP最常推荐的一线药物^[121-123]。度洛西汀也是治疗cLBP安全有效的一线用药^[124],对乙酰氨基酚和其他抗抑郁药是治疗cLBP的二线药物,不建议使用苯二氮卓类药物和抗生素治疗cLBP^[121]。

阿片类药物不建议用于cLBP的初始治疗^[125],长期使用阿片类药物在改善疼痛或残疾方面并不优于非阿片类药物^[126],但羟吗啡酮、他喷他多和芬太尼在减轻腰背痛方面显示出很好的疗效,是有效治疗cLBP的阿片类药物^[127]。

联合药物治疗在改善cLBP的疼痛和残疾方面比单药治疗更有效^[128-129],能够更好地缓解疼痛,提高耐受性^[130]。如普瑞巴林联合塞来昔布或阿片类药物,被证明比其中一种单一疗法更有效^[129]。曲马多-对乙酰氨基酚合剂可有效降低腰痛强度^[131]。NSAIDs与肌肉松弛药(如替扎尼定等)的联合、NSAIDs(如右酮洛芬氨丁三醇注射液等)与阿片类药物的联合,临床用于LBP的治疗^[132-133]。

中成药是指以中医药理论为指导、以中药材为



原料、以规定的处方和制剂工艺为标准、经国家药品监督管理部门批准、加工制成的不同剂型的中药制品。中成药广泛应用于cLBP的临床治疗,如痹祺胶囊、仙灵骨葆胶囊、风湿骨痛胶囊、活血止痛软胶囊、盘龙七片、丹鹿通督片、瘀血痹片、腰肾膏、通络祛痛膏、骨通贴膏、祛风骨痛凝胶膏等。

五、心理治疗

心理治疗(psychotherapy)是指在治疗师与患者建立起良好治疗关系的基础上,由经过专业训练的治疗师运用专业的理论和技术,对患者进行治疗的过程。大多数cLBP患者因疼痛出现恐惧-回避心理,社会心理因素在cLBP中很重要^[9],对cLBP开展心理治疗非常必要且相当重要。

认知疗法(cognitive therapy, CT)、正念冥想(mindfulness-meditation, MM)和基于正念的认知疗法(mindfulness-based cognitive therapy, MBCT)是治疗cLBP最常用的3种心理治疗方法,相互之间关系密切^[166-167](表11),能够缓解疼痛强度,改善残疾情况,提高生活质量,减少恐惧回避信念^[9, 168]。对于cNSLBP患者,心理干预与物理治疗相结合时更有效^[169]。

表11 常见心理治疗方法循证医学证据质量分级及推荐强度

治疗方法	证据等级	推荐强度
认知行为疗法 ^[170-172]	A	1
基于正念的身心疗法 ^[173]	A	2
基于正念的减压疗法 ^[174-176]	A	2
冥想 ^[177]	B	2

六、数字医疗

数字医疗是把现代数字信息技术应用于整个医疗过程的一种新型医疗方式,已经由电子医疗(eHealth)和移动医疗(mHealth)发展到数字疗法(digital therapeutics, DTx)。数字医疗可以协助cLBP患者进行健康教育、自我管理,改善cLBP患者的疼痛和残疾,提高临床疗效,还可以开展DTx(表12)。

表12 常见数字医疗循证医学证据质量分级及推荐强度

治疗方法	证据等级	推荐强度
电子医疗 ^[184-186]	A	2
移动医疗 ^[41, 187-190]	A	2
远程医疗 ^[191-193]	A	2
数字疗法 ^[178-183]	A	1

DTx是由软件程序驱动,以循证医学为基础的

干预方案,用以治疗、管理或预防疾病。DTx可以单独使用,也可以与药物、医疗器械或其他疗法配合使用^[178]。DTx在cLBP的治疗策略中被美国医师协会认为是非药物治疗的一线选择^[179],显著降低cLBP患者疼痛强度和运动恐惧症^[180-182],最大限度地减少对阿片类药物的需求^[183]。

七、微创介入治疗

cLBP微创介入治疗方法包括注射治疗(表13)、脊柱微创介入治疗(表14)和神经调控治疗(表15)。在一些cLBP介入治疗指南中,推荐数量最多的治疗方法是射频热凝术和小关节手术^[194]。

表13 常见注射治疗方法循证医学证据质量分级及推荐强度

治疗方法	治疗推荐	证据等级	推荐强度
硬膜外注射	经椎板间隙注射类固醇治疗 ^[195-196]	A	1
	经椎间孔注射类固醇治疗 ^[195, 197]	A	1
	经骶管注射类固醇治疗 ^[195, 198]	A	1
	单独注射类固醇或/和局麻药 ^[195, 199-200]	A	2
	注射富血小板血浆 ^[201-202]	B	2
腰椎小关节注射	小关节内注射类固醇 ^[203-204]	A	1
	小关节内注射PRP ^[205-206]	A	2
椎间盘内注射	椎间盘内注射PRP ^[201, 206-209]	B	2
	椎间盘内注射间充质干细胞 ^[208, 210]	B	3
	椎间盘内注射臭氧 ^[211-212]	A	1
	椎间盘内注射亚甲蓝 ^[213-214]	A	2
骶髂关节注射	骶髂关节内注射类固醇 ^[215]	A	1
	骶髂关节内注射PRP ^[216-218]	B	2

表14 常见脊柱微创介入治疗方法循证医学证据质量分级及推荐强度

治疗方法	证据等级	推荐强度
经皮脊柱内镜椎间盘手术 ^[219]	A	1
椎体充填扩张术 ^[220]	A	1
腰椎射频消融术 ^[221-222]	A	1
腰椎低温等离子髓核成型(减压)术 ^[223]	A	1
骶髂关节射频消融术 ^[224]	A	1
椎基神经射频消融术 ^[225-226]	A	2

表15 常见神经调控技术循证医学证据质量分级及推荐强度

治疗方法	证据等级	推荐强度
脊髓电刺激 ^[227-228]	A	2
鞘内药物输注 ^[229]	A	2
外周神经电刺激-脊神经内侧支电刺激 ^[230]	B	2
外周神经区域刺激 ^[231]	B	2

八、手术治疗

对于部分反复发作的cLBP患者,可行外科手术,如腰椎内固定术、减压手术^[232]等。



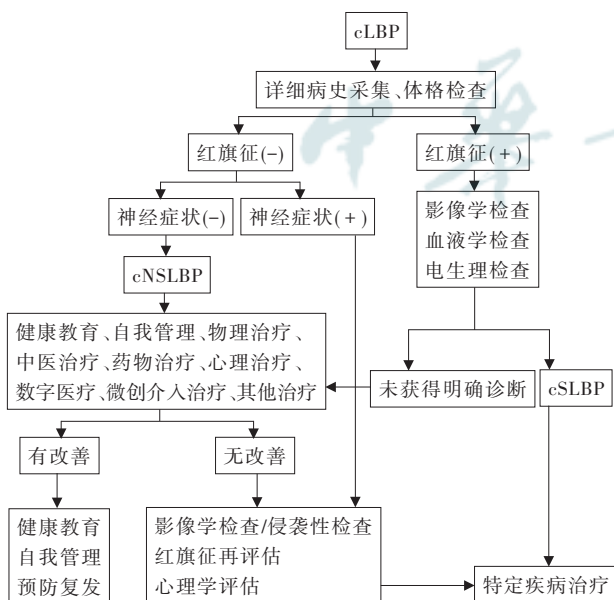
预防与康复

预防在cLBP的治疗策略中占据非常重要的位置,形成正确疾病预防观念、优化生活方式、避免cLBP的发病危险因素,可以有效减少cLBP的发病率,降低疾病的严重程度^[233]。保持健康的体重可预防cLBP发生^[234]。闲暇时间的体育活动可将cLBP的风险降低11%~16%^[235]。运动与健康教育相结合更有利预防腰痛^[236-237]。

康复是cLBP全病程管理中不可或缺的一环^[238]。个体疾病的康复可能与未来的工作参与密切相关^[239]。康复与预防、临床干预一起,参与cLBP的全程管理,有效改善疾病转归。

小结

cLBP发病率高、致残率高、复发率高,给个人、家庭、社会带来极大的危害和负担。对于患者来说,增加对cLBP的了解,做好自我管理,积极配合医生治疗,对疾病的转归非常重要。对于医务人员来讲,在加强对患者的健康教育、提升自身业务能力的同时,要遵循临床诊疗规范,做好cLBP诊断、治疗及预防。对于政策制定者及相关学术组织来说,要做好cLBP诊疗规范和指南制定,加强行业管理并不断促进cLBP诊疗规范和指南的推广应用。



注:cLBP为慢性腰痛;cNSLBP为慢性非特异性腰痛;
cSLBP为慢性特异性腰痛

附件1 cLBP诊疗流程图

附件2 指南指导委员会成员(按照姓氏笔画排列)

马柯(上海交通大学医学院附属新华医院疼痛科)、王云霞(湖北省第三人民医院疼痛科)、王林(贵州医科大学附属医院)、王德全(新疆维吾尔自治区人民医院疼痛科)、师存伟(青海大学附属医院疼痛科)、吕岩(空军军医大学附属西京医院疼痛科)、庄志刚(郑州大学第二附属医院疼痛科)、刘先国(中山大学中山医学院)、刘延青(首都医科大学附属北京天坛医院疼痛科)、刘庆(西南医科大学附属医院中医医院疼痛科)、刘金锋(哈尔滨医科大学附属第二医院疼痛科)、刘堂华(中关村中美精准医学科技研究院疼痛病研究所)、李艳华(云南省第一人民医院疼痛科)、杨晓秋(重庆医科大学附属第一医院疼痛科)、宋涛(中国医科大学附属第一医院疼痛科)、张小梅(昆明医科大学第一附属医院疼痛科)、张宝娟(济宁市第一人民医院疼痛科)、陆丽娟(南京大学医学院附属鼓楼医院疼痛科)、林学武(蚌埠医科大学第一附属医院疼痛科)、胡永生(首都医科大学宣武医院功能神经外科)、夏令杰(河南省人民医院疼痛科)、黄东(中南大学湘雅三医院疼痛科)、彭宝淦(解放军总医院第三医学中心骨科)、程志祥(南京医科大学第二附属医院疼痛科)

利益冲突 所有作者均声明无利益冲突

参考文献

- [1] Roseen EJ, Rajendran I, Stein P, et al. Association of back pain with mortality: a systematic review and meta-analysis of cohort studies[J]. J Gen Intern Med, 2021, 36(10): 3148-3158. DOI: 10.1007/s11606-021-06732-6.
- [2] Ma K, Zhuang ZG, Wang L, et al. The Chinese association for the study of pain (CASP): consensus on the assessment and management of chronic nonspecific low back pain[J]. Pain Res Manag, 2019, 2019: 8957847. DOI: 10.1155/2019/8957847.
- [3] 国家卫生健康委能力建设和继续教育中心疼痛病诊疗专项能力培训项目专家组. 慢性腰背痛康复中国疼痛科专家共识[J]. 中华疼痛学杂志, 2021, 17(6): 570-579. DOI: 10.3760/cma.j.cn101658-20211119-00168.
- [4] Guyatt G, Oxman AD, Akl EA, et al. GRADE guidelines: 1. introduction-GRADE evidence profiles and summary of findings tables[J]. J Clin Epidemiol, 2011, 64(4): 383-394. DOI: 10.1016/j.jclinepi.2010.04.026.
- [5] Balshem H, Helfand M, Schünemann HJ, et al. GRADE guidelines: 3. rating the quality of evidence[J]. J Clin Epidemiol, 2011, 64(4): 401-406. DOI: 10.1016/j.jclinepi.2010.07.015.
- [6] Jaeschke R, Guyatt GH, Dellinger P, et al. Use of GRADE grid to reach decisions on clinical practice guidelines when consensus is elusive[J]. BMJ, 2008, 337: a744. DOI: 10.1136/bmj.a744.
- [7] Clark S, Horton R. Low back pain: a major global challenge[J]. Lancet, 2018, 391(10137): 2302. DOI: 10.1016/S0140-6736(18)30725-6.
- [8] Shirado O, Arai Y, Iguchi T, et al. Formulation of Japanese



- orthopaedic association (JOA) clinical practice guideline for the management of low back pain-the revised 2019 edition [J]. *J Orthop Sci*, 2022, 27(1): 3-30. DOI: 10.1016/j.jos.2021.06.024.
- [9] Petrucci G, Papalia GF, Russo F, et al. Psychological approaches for the integrative care of chronic low back pain: a systematic review and metanalysis [J]. *Int J Environ Res Public Health*, 2021, 19(1): 60. DOI: 10.3390/ijerph19010060.
- [10] de Souza IMB, Sakaguchi TF, Yuan SLK, et al. Prevalence of low back pain in the elderly population: a systematic review [J]. *Clinics (Sao Paulo)*, 2019, 74: e789. DOI: 10.6061/clinics/2019/e789.
- [11] Shanthanna H, Gilron I, Rajarathnam M, et al. Benefits and safety of gabapentinoids in chronic low back pain: a systematic review and meta-analysis of randomized controlled trials [J]. *PLoS Med*, 2017, 14(8): e1002369. DOI: 10.1371/journal.pmed.1002369.
- [12] 刘延青, 郑拥军. 中国居民慢性腰痛流行病学调查[J]. *中华医学信息导报*, 2017, 32(21): 12. DOI: 10.3969/j.issn.1000-8039.2017.21.012.
- [13] Kahere M, Hlongwa M, Ginindza TG. A scoping review on the epidemiology of chronic low back pain among adults in Sub-Saharan Africa [J]. *Int J Environ Res Public Health*, 2022, 19(5): 2964. DOI: 10.3390/ijerph19052964.
- [14] Wong CK, Mak RY, Kwok TS, et al. Prevalence, incidence, and factors associated with non-specific chronic low back pain in community-dwelling older adults aged 60 years and older: a systematic review and meta-analysis [J]. *J Pain*, 2022, 23(4): 509-534. DOI: 10.1016/j.jpain.2021.07.012.
- [15] Fatoye F, Gebrye T, Odeyemi I. Real-world incidence and prevalence of low back pain using routinely collected data [J]. *Rheumatol Int*, 2019, 39(4): 619-626. DOI: 10.1007/s00296-019-04273-0.
- [16] Al Amer HS. Low back pain prevalence and risk factors among health workers in Saudi Arabia: a systematic review and meta-analysis [J]. *J Occup Health*, 2020, 62(1): e12155. DOI: 10.1002/1348-9585.12155.
- [17] Taylor JB, Goode AP, George SZ, et al. Incidence and risk factors for first-time incident low back pain: a systematic review and meta-analysis [J]. *Spine J*, 2014, 14(10): 2299-2319. DOI: 10.1016/j.spinee.2014.01.026.
- [18] Øiestad BE, Hilde G, Tveter AT, et al. Risk factors for episodes of back pain in emerging adults. A systematic review [J]. *Eur J Pain*, 2020, 24(1): 19-38. DOI: 10.1002/ejp.1474.
- [19] Felício DC, Filho JE, de Oliveira TMD, et al. Risk factors for non-specific low back pain in older people: a systematic review with meta-analysis [J]. *Arch Orthop Trauma Surg*, 2022, 142(12): 3633-3642. DOI: 10.1007/s00402-021-03959-0.
- [20] Baradaran Mahdavi S, Riahi R, Vahdatpour B, et al. Association between sedentary behavior and low back pain: a systematic review and meta-analysis [J]. *Health Promot Perspect*, 2021, 11(4): 393-410. DOI: 10.34172/hpp.2021.50.
- [21] Hoy D, Bain C, Williams G, et al. A systematic review of the global prevalence of low back pain [J]. *Arthritis Rheum*, 2012, 64(6): 2028-2037. DOI: 10.1002/art.34347.
- [22] Knezevic NN, Candido KD, Vlaeyen JWS, et al. Low back pain [J]. *Lancet*, 2021, 398(10294): 78-92. DOI: 10.1016/S0140-6736(21)00733-9.
- [23] Pinto EM, Neves JR, Laranjeira M, et al. The importance of inflammatory biomarkers in non-specific acute and chronic low back pain: a systematic review [J]. *Eur Spine J*, 2023, 32(9): 3230-3244. DOI: 10.1007/s00586-023-07717-1.
- [24] Lim YZ, Wang Y, Cicuttini FM, et al. Association between inflammatory biomarkers and nonspecific low back pain: a systematic review [J]. *Clin J Pain*, 2020, 36(5): 379-389. DOI: 10.1097/AJP.0000000000000810.
- [25] Carvalho-E-Silva APMC, Harmer AR, Pinheiro MB, et al. Does the heritability of chronic low back pain depend on how the condition is assessed? [J]. *Eur J Pain*, 2019, 23(9): 1712-1722. DOI: 10.1002/ejp.1448.
- [26] Ng SK, Urquhart DM, Fitzgerald PB, et al. The relationship between structural and functional brain changes and altered emotion and cognition in chronic low back pain brain changes: a systematic review of MRI and fMRI studies [J]. *Clin J Pain*, 2018, 34(3): 237-261. DOI: 10.1097/AJP.0000000000000534.
- [27] Dorsi M, Belzberg A. Low back pain [M]. //Jeffery. Non-specific low back pain. New York: McGrawHill, 2005: 141-146.
- [28] Chou R, Huffman LH; American Pain Society; American College of Physicians. Nonpharmacologic therapies for acute and chronic low back pain: a review of the evidence for an American Pain Society/American College of Physicians clinical practice guideline [J]. *Ann Intern Med*, 2007, 147(7): 492-504. DOI: 10.7326/0003-4819-147-7-200710020-00007.
- [29] Chou R, Huffman LH; American Pain Society; American College of Physicians. Medications for acute and chronic low back pain: a review of the evidence for an American Pain Society/American College of Physicians clinical practice guideline [J]. *Ann Intern Med*, 2007, 147(7): 505-514. DOI: 10.7326/0003-4819-147-7-200710020-00008.
- [30] Poder TG, Beffarat M. Attributes underlying non-surgical treatment choice for people with low back pain: a systematic mixed studies review [J]. *Int J Health Policy Manag*, 2021, 10(4): 201-210. DOI: 10.34172/ijhpm.2020.49.
- [31] Wang L, Guo Q, Lu X, et al. Surgical versus nonsurgical treatment of chronic low back pain: a meta-analysis based on current evidence [J]. *J Back Musculoskelet Rehabil*, 2016, 29(3): 393-401. DOI: 10.3233/BMR-150632.
- [32] Stock C. Grand challenges for public health education and promotion [J]. *Front Public Health*, 2022, 10: 917685. DOI: 10.3389/fpubh.2022.917685.
- [33] Lim YZ, Chou L, Au RT, et al. People with low back pain want clear, consistent and personalised information on prognosis, treatment options and self-management strategies: a systematic review [J]. *J Physiother*, 2019, 65(3): 124-135. DOI: 10.1016/j.



- jphys.2019.05.010.
- [34] Kim SK, Kim HS, Chung SS. Effects of an individualized educational program for Korean patients with chronic low back pain: a randomized controlled trial[J]. *J Nurs Res*, 2021, 29(6): e177. DOI: 10.1097/jnr.0000000000000455.
 - [35] Sharma S, Jensen MP, Moseley GL, et al. Results of a feasibility randomised clinical trial on pain education for low back pain in Nepal: the Pain Education in Nepal-Low Back Pain (PEN-LBP) feasibility trial [J]. *BMJ Open*, 2019, 9(3): e026874. DOI: 10.1136/bmjopen-2018-026874.
 - [36] Zahari Z, Ishak A, Justine M. The effectiveness of patient education in improving pain, disability and quality of life among older people with low back pain: a systematic review [J]. *J Back Musculoskelet Rehabil*, 2020, 33(2): 245-254. DOI: 10.3233/BMR-181305.
 - [37] Ma X, Chen R, Li W, et al. A systematic review and meta-analysis of pain neuroscience education for chronic low back pain: short-term outcomes of pain and disability [J]. *Physiother Theory Pract*, 2023, 3: 1-20. DOI: 10.1080/09593985.2023.2232003.
 - [38] 李定良, 汪华琼, 陈凤, 等. 健康教育对腰痛干预疗效的系统评价和 Meta 分析 [J]. *中国康复*, 2020, 35(5): 262-268. DOI: 10.3870/zgkf.2020.05.010.
 - [39] Nicholl BI, Sandal LF, Stochkendahl MJ, et al. Digital support interventions for the self-management of low back pain: a systematic review [J]. *J Med Internet Res*, 2017, 19(5): e179. DOI: 10.2196/jmir.7290.
 - [40] Du S, Hu L, Dong J, et al. Self-management program for chronic low back pain: a systematic review and meta-analysis [J]. *Patient Educ Couns*, 2017, 100(1): 37-49. DOI: 10.1016/j.pec.2016.07.029.
 - [41] Rathnayake APS, Sparkes V, Sheeran L. What is the effect of low back pain self-management interventions with exercise components added? A systematic review with meta-analysis [J]. *Musculoskelet Sci Pract*, 2021, 56: 102469. DOI: 10.1016/j.msksp.2021.102469.
 - [42] Abdildin Y, Tapinova K, Jyeniskhan N, et al. High-intensity laser therapy in low back pain management: a systematic review with meta-analysis [J]. *Lasers Med Sci*, 2023, 38(1): 166. DOI: 10.1007/s10103-023-03827-w.
 - [43] Notarnicola A, Maccagnano G, Tafuri S, et al. High level laser therapy for the treatment of lower back pain: clinical efficacy and comparison of different wavelengths [J]. *J Biol Regul Homeost Agents*, 2016, 30(4): 1157-1164.
 - [44] Huang Z, Ma J, Chen J, et al. The effectiveness of low-level laser therapy for nonspecific chronic low back pain: a systematic review and meta-analysis [J]. *Arthritis Res Ther*, 2015, 17: 360. DOI: 10.1186/s13075-015-0882-0.
 - [45] Glazov G, Yelland M, Emery J. Low-level laser therapy for chronic non-specific low back pain: a meta-analysis of randomised controlled trials [J]. *Acupunct Med*, 2016, 34(5): 328-341. DOI: 10.1136/acupmed-2015-011036.
 - [46] Jauregui JJ, Cherian JJ, Gwam CU, et al. A meta-analysis of transcutaneous electrical nerve stimulation for chronic low back pain [J]. *Surg Technol Int*, 2016, 28: 296-302.
 - [47] Wu LC, Weng PW, Chen CH, et al. Literature review and meta-analysis of transcutaneous electrical nerve stimulation in treating chronic back pain [J]. *Reg Anesth Pain Med*, 2018, 43(4): 425-433. DOI: 10.1097/AAP.0000000000000740.
 - [48] Verville L, Hincapié CA, Southerst D, et al. Systematic review to inform a world health organization (WHO) clinical practice guideline: benefits and harms of transcutaneous electrical nerve stimulation (TENS) for chronic primary low back pain in adults [J]. *J Occup Rehabil*, 2023, 33(4): 651-660. DOI: 10.1007/s10926-023-10121-7.
 - [49] Rampazo ÉP, Júnior MAL, Corrêa JB, et al. Effectiveness of interferential current in patients with chronic non-specific low back pain: a systematic review with meta-analysis [J]. *Braz J Phys Ther*, 2023, 27(5): 100549. DOI: 10.1016/j.bjpt.2023.100549.
 - [50] Albornoz-Cabello M, Maya-Martín J, Domínguez-Maldonado G, et al. Effect of interferential current therapy on pain perception and disability level in subjects with chronic low back pain: a randomized controlled trial [J]. *Clin Rehabil*, 2017, 31(2): 242-249. DOI: 10.1177/0269215516639653.
 - [51] Ebadi S, Henschke N, Forogh B, et al. Therapeutic ultrasound for chronic low back pain [J]. *Cochrane Database Syst Rev*, 2020, 7(7): CD009169. DOI: 10.1002/14651858.CD009169.pub3.
 - [52] Noori SA, Rasheed A, Aiyer R, et al. Therapeutic ultrasound for pain management in chronic low back pain and chronic neck pain: a systematic review [J]. *Pain Med*, 2020, 21(7): 1482-1493. DOI: 10.1093/pm/pny287.
 - [53] Sun X, Huang L, Wang L, et al. Efficacy of pulsed electromagnetic field on pain and physical function in patients with low back pain: a systematic review and meta-analysis [J]. *Clin Rehabil*, 2022, 36(5): 636-649. DOI: 10.1177/02692155221074052.
 - [54] Andrade R, Duarte H, Pereira R, et al. Pulsed electromagnetic field therapy effectiveness in low back pain: a systematic review of randomized controlled trials [J]. *Porto Biomed J*, 2016, 1(5): 156-163. DOI: 10.1016/j.pbj.2016.09.001.
 - [55] Mao S, Xiao K, Zhou W, et al. The impact of hot spring hydrotherapy on pain perception and dysfunction severity in patients with chronic low back pain: a systematic review and meta-analysis [J]. *J Pain Res*, 2023, 16: 3925-3944. DOI: 10.2147/JPR.S438744.
 - [56] Yue L, Sun MS, Chen H, et al. Extracorporeal shockwave therapy for treating chronic low back pain: a systematic review and meta-analysis of randomized controlled trials [J]. *Biomed Res Int*, 2021, 2021: 5937250. DOI: 10.1155/2021/5937250.
 - [57] Li C, Xiao Z, Chen L, et al. Efficacy and safety of extracorporeal shock wave on low back pain: a systematic review and meta-analysis [J]. *Medicine (Baltimore)*, 2022, 101(52): e32053. DOI: 10.1097/MD.00000000000032053.
 - [58] Liu K, Zhang Q, Chen L, et al. Efficacy and safety of



- extracorporeal shockwave therapy in chronic low back pain: a systematic review and meta-analysis of 632 patients [J]. *J Orthop Surg Res*, 2023, 18(1): 455. DOI: 10.1186/s13018-023-03943-x.
- [59] Wu Z, Zhou T, Ai S. Extracorporeal shock wave therapy for low back pain: a systematic review and meta-analysis [J]. *Medicine (Baltimore)*, 2023, 102(52): e36596. DOI: 10.1097/MD.000000000000036596.
- [60] 高卫邦, 叶金群, 张鸣生. 应用深层肌肉刺激仪治疗非特异性下腰痛的临床疗效观察 [J]. *中国医药科学*, 2017, 7(23): 182-184, 252. DOI: 10.3969/j.issn.2095-0616.2017.23.055.
- [61] 闫勃, 高春华, 梁艳秋, 等. DMS 配合 McKenzie 疗法治疗腰椎间盘突出症的疗效观察 [J]. *中国康复*, 2016, 31(3): 208-210. DOI: 10.3870/zgkf.2016.03.015.
- [62] Wood L, Bishop A, Lewis M, et al. Treatment targets of exercise for persistent non-specific low back pain: a consensus study [J]. *Physiotherapy*, 2021, 112: 78-86. DOI: 10.1016/j.physio.2021.03.005.
- [63] Hayden JA, Wilson MN, Stewart S, et al. Exercise treatment effect modifiers in persistent low back pain: an individual participant data meta-analysis of 3514 participants from 27 randomised controlled trials [J]. *Br J Sports Med*, 2020, 54(21): 1277-1278. DOI: 10.1136/bjsports-2019-101205.
- [64] Kolber MR, Ton J, Thomas B, et al. PEER systematic review of randomized controlled trials: management of chronic low back pain in primary care [J]. *Can Fam Physician*, 2021, 67(1): e20-e30. DOI: 10.46747/cfp.6701e20.
- [65] Grooten WJA, Boström C, Dederding Å, et al. Summarizing the effects of different exercise types in chronic low back pain—a systematic review of systematic reviews [J]. *BMC Musculoskeletal Disord*, 2022, 23(1): 801. DOI: 10.1186/s12891-022-05722-x.
- [66] Hayden JA, Ellis J, Ogilvie R, et al. Some types of exercise are more effective than others in people with chronic low back pain: a network meta-analysis [J]. *J Physiother*, 2021, 67(4): 252-262. DOI: 10.1016/j.jphys.2021.09.004.
- [67] Fernández-Rodríguez R, Álvarez-Bueno C, Cavero-Redondo I, et al. Best exercise options for reducing pain and disability in adults with chronic low back pain: pilates, strength, core-based, and mind-body. A network meta-analysis [J]. *J Orthop Sports Phys Ther*, 2022, 52(8): 505-521. DOI: 10.2519/jospt.2022.10671.
- [68] Yu Z, Yin Y, Wang J, et al. Efficacy of pilates on pain, functional disorders and quality of life in patients with chronic low back pain: a systematic review and meta-analysis [J]. *Int J Environ Res Public Health*, 2023, 20(4): 2850. DOI: 10.3390/ijerph20042850.
- [69] Franks J, Thwaites C, Morris ME. Pilates to improve core muscle activation in chronic low back pain: a systematic review [J]. *Healthcare (Basel)*, 2023, 11(10): 1404. DOI: 10.3390/healthcare11101404.
- [70] Patti A, Thornton JS, Giustino V, et al. Effectiveness of pilates exercise on low back pain: a systematic review with meta-analysis [J]. *Disabil Rehabil*, 2023, 26: 1-14. DOI: 10.1080/09638288.2023.2251404.
- [71] Huang J, Park HY. Effect of pilates training on pain and disability in patients with chronic low back pain: a systematic review and meta-analysis based on randomized controlled trials [J]. *Phys Act Nutr*, 2023, 27(1): 16-29. DOI: 10.20463/pan.2023.0003.
- [72] 黄文哲, 成波锦, 谢雯. 普拉提运动对下腰痛干预效果的 Meta 分析 [J]. *湖北体育科技*, 2023, 42(7): 606-611, 628. DOI: 10.3969/j.issn.1003-983X.2023.07.008.
- [73] Namnaqani FI, Mashabi AS, Yaseen KM, et al. The effectiveness of McKenzie method compared to manual therapy for treating chronic low back pain: a systematic review [J]. *J Musculoskeletal Neuronal Interact*, 2019, 19(4): 492-499. PMID: 31789300.
- [74] 金筱好, 邓蓉蓉, 孔佳星, 等. McKenzie 疗法治疗下腰痛临床疗效的 Meta 分析 [J]. *华南国防医学杂志*, 2021, 35(4): 282-291. DOI: 10.13730/j.issn.1009-2595.2021.04.011.
- [75] Anheyer D, Haller H, Lauche R, et al. Yoga for treating low back pain: a systematic review and meta-analysis [J]. *Pain*, 2022, 163(4): e504-e517. DOI: 10.1097/j.pain.0000000000002416.
- [76] Zhu F, Zhang M, Wang D, et al. Yoga compared to non-exercise or physical therapy exercise on pain, disability, and quality of life for patients with chronic low back pain: a systematic review and meta-analysis of randomized controlled trials [J]. *PLoS One*, 2020, 15(9): e0238544. DOI: 10.1371/journal.pone.0238544.
- [77] Zhang X, Chang T, Hu W, et al. Efficacy and safety of yoga for the management of chronic low back pain: an overview of systematic reviews [J]. *Front Neurol*, 2023, 14: 1273473. DOI: 10.3389/fneur.2023.1273473.
- [78] Kim SD. Twelve weeks of yoga for chronic nonspecific lower back pain: a meta-analysis [J]. *Pain Manag Nurs*, 2020, 21(6): 536-542. DOI: 10.1016/j.pmn.2020.07.002.
- [79] Sheng Y, Duan Z, Qu Q, et al. Kinesio taping in treatment of chronic non-specific low back pain: a systematic review and meta-analysis [J]. *J Rehabil Med*, 2019, 51(10): 734-740. DOI: 10.2340/16501977-2605.
- [80] Li Y, Yin Y, Jia G, et al. Effects of kinesiotape on pain and disability in individuals with chronic low back pain: a systematic review and meta-analysis of randomized controlled trials [J]. *Clin Rehabil*, 2019, 33(4): 596-606. DOI: 10.1177/0269215518817804.
- [81] Pan L, Li Y, Gao L, et al. Effects of kinesio taping for chronic nonspecific low back pain: a systematic review and meta-analysis [J]. *Altern Ther Health Med*, 2023, 29(6): 68-76. PMID: 37171950.
- [82] Luz Júnior MAD, Almeida MO, Santos RS, et al. Effectiveness of kinesio taping in patients with chronic nonspecific low back pain: a systematic review with meta-analysis [J]. *Spine (Phila Pa 1976)*, 2019, 44(1): 68-78. DOI: 10.1097/BRS.0000000000002756.
- [83] Syroyid Syroyid I, Cavero-Redondo I, Syroyid Syroyid B. Effects of resistance training on pain control and physical function in older adults with low back pain: a systematic review with meta-analysis [J]. *J Geriatr Phys Ther*, 2022, 46(3): E113-E126. DOI: 10.1519/JPT.0000000000000374.
- [84] Cortell-Tormo JM, Sánchez PT, Chulvi-Medrano I, et al. Effects of



- functional resistance training on fitness and quality of life in females with chronic nonspecific low-back pain [J]. *J Back Musculoskelet Rehabil*, 2018, 31(1): 95-105. DOI: 10.3233/BMR-169684.
- [85] Lawford BJ, Walters J, Ferrar K. Does walking improve disability status, function, or quality of life in adults with chronic low back pain? A systematic review [J]. *Clin Rehabil*, 2016, 30(6): 523-536. DOI: 10.1177/0269215515590487.
- [86] Sitthipornvorakul E, Klinsophon T, Sihawong R, et al. The effects of walking intervention in patients with chronic low back pain: a meta-analysis of randomized controlled trials [J]. *Musculoskelet Sci Pract*, 2018, 34: 38-46. DOI: 10.1016/j.msksp.2017.12.003.
- [87] Kazeminia M, Rajati F, Rajati M. The effect of pelvic floor muscle-strengthening exercises on low back pain: a systematic review and meta-analysis on randomized clinical trials [J]. *Neurol Sci*, 2023, 44(3): 859-872. DOI: 10.1007/s10072-022-06430-z.
- [88] Bi X, Zhao J, Zhao L, et al. Pelvic floor muscle exercise for chronic low back pain [J]. *J Int Med Res*, 2013, 41(1): 146-152. DOI: 10.1177/0300060513475383.
- [89] 杜丽梅, 王晚红, 丁丽. 悬吊运动治疗慢性腰痛疗效的 Meta 分析 [J]. *循证护理*, 2023, 9(12): 2091-2096. DOI: 10.12102/j.issn.2095-8668.2023.12.001.
- [90] 黄墩兵, 周凡萍, 黄赛娥. 悬吊运动疗法治疗慢性非特异性腰痛疗效的 Meta 分析 [J]. *中国康复理论与实践*, 2017, 23(12): 1435-1442. DOI: 10.3969/j.issn.1006-9771.2017.12.014.
- [91] Smrcina Z, Woelfel S, Burcal C. A systematic review of the effectiveness of core stability exercises in patients with non-specific low back pain [J]. *Int J Sports Phys Ther*, 2022, 17(5): 766-774. DOI: 10.26603/001c.37251.
- [92] Stuber KJ, Bruno P, Sajko S, et al. Core stability exercises for low back pain in athletes: a systematic review of the literature [J]. *Clin J Sport Med*, 2014, 24(6): 448-456. DOI: 10.1097/JSM.0000000000000081.
- [93] Shi J, Liu Z, Zhou X, et al. Effects of breathing exercises on low back pain in clinical: a systematic review and meta-analysis [J]. *Complement Ther Med*, 2023, 79: 102993. DOI: 10.1016/j.ctim.2023.102993.
- [94] 赵强, 张桂忠, 张宁, 等. 呼吸训练治疗非特异性下腰背痛效果系统回顾及 Meta 分析 [J]. *内蒙古师范大学学报(自然科学汉文版)*, 2023, 52(2): 162-168. DOI: 10.3969/j.issn.1001-8735.2023.02.008.
- [95] Asano H, Plonka D, Weeger J. Effectiveness of acupuncture for nonspecific chronic low back pain: a systematic review and meta-analysis [J]. *Med Acupunct*, 2022, 34(2): 96-106. DOI: 10.1089/acu.2021.0057.
- [96] Mu J, Furlan AD, Lam WY, et al. Acupuncture for chronic nonspecific low back pain [J]. *Cochrane Database Syst Rev*, 2020, 12(12): CD013814. DOI: 10.1002/14651858.CD013814.
- [97] Li YX, Yuan SE, Jiang JQ, et al. Systematic review and meta-analysis of effects of acupuncture on pain and function in non-specific low back pain [J]. *Acupunct Med*, 2020, 38(4): 235-243. DOI: 10.1136/acupmed-2017-011622.
- [98] Lara-Palomo IC, Gil-Martínez E, López-Fernández MD, et al. Efficacy of dry needling for chronic low back pain: a systematic review and meta-analysis of randomized controlled trials [J]. *Altern Ther Health Med*, 2023, 29(8): 110-120. PMID: 36399082.
- [99] Dach F, Ferreira KS. Treating myofascial pain with dry needling: a systematic review for the best evidence-based practices in low back pain [J]. *Arq Neuropsiquiatr*, 2023, 81(12): 1169-1178. DOI: 10.1055/s-0043-1777731.
- [100] Hu X, Dong S, Zhang B, et al. Efficacy of silver needle therapy for the treatment of chronic nonspecific low back pain: a prospective, single-center, randomized, parallel-controlled clinical trial [J]. *Trials*, 2021, 22(1): 75. DOI: 10.1186/s13063-021-05040-y.
- [101] 王鸿, 董宝强, 王刚, 等. 密集型银质针治疗非特异性下腰痛多中心随机对照研究 [J]. *实用中医内科杂志*, 2022, 36(2): 35-37. DOI: 10.13729/j.issn.1671-7813.20210669.
- [102] 陶林, 杨峰, 张磊, 等. 内热针与其他针刺疗法治疗腰痛的系统评价与 Meta 分析 [J]. *中国中医急症*, 2021, 30(11): 1891-1896. DOI: 10.3969/j.issn.1004-745X.2021.11.003.
- [103] 武欢, 金玮, 周玉梅, 等. 内热针治疗寒湿型腰痛的随机对照研究 [J]. *实用中西医结合临床*, 2017, 17(1): 6-8. DOI: 10.13638/j.issn.1671-4040.2017.01.003.
- [104] Shen WC, Jan YK, Liao BY, et al. Effectiveness of self-management of dry and wet cupping therapy for low back pain: a systematic review and meta-analysis [J]. *Medicine (Baltimore)*, 2022, 101(51): e32325. DOI: 10.1097/MD.00000000000032325.
- [105] Moura CC, Chaves ÉCL, Cardoso ACLR, et al. Cupping therapy and chronic back pain: systematic review and meta-analysis [J]. *Rev Lat Am Enfermagem*, 2018, 26: e3094. DOI: 10.1590/1518-8345.2888.3094.
- [106] Wang YT, Qi Y, Tang FY, et al. The effect of cupping therapy for low back pain: a meta-analysis based on existing randomized controlled trials [J]. *J Back Musculoskelet Rehabil*, 2017, 30(6): 1187-1195. DOI: 10.3233/BMR-169736.
- [107] Chen FQ, Ge JF, Leng YF, et al. Efficacy and safety of moxibustion for chronic low back pain: a systematic review and meta-analysis of randomized controlled trials [J]. *Complement Ther Clin Pract*, 2020, 39: 101130. DOI: 10.1016/j.ctcp.2020.101130.
- [108] 田阡陌, 徐道明, 吴文忠, 等. 艾灸治疗原发性骨质疏松症患者腰背疼痛有效性的系统评价 [J]. *天津中医药*, 2018, 35(9): 684-690. DOI: 10.11656/j.issn.1672-1519.2018.09.13.
- [109] Qin J, Zhang Y, Wu L, et al. Effect of Tai Chi alone or as additional therapy on low back pain: systematic review and meta-analysis of randomized controlled trials [J]. *Medicine (Baltimore)*, 2019, 98(37): e17099. DOI: 10.1097/MD.00000000000017099.
- [110] 张海娇, 孙卫格, 唐丽梅, 等. 太极拳干预非特异性腰背痛的 Meta 分析 [J]. *中国民族民间医药*, 2021, 30(14): 61-65, 70. DOI: 10.3969/j.issn.1007-8517.2021.14.zgmzmjyzyz-202114015.



- [111] 李翔, 王芄斌, 李天骄, 等. 太极拳治疗下腰痛临床疗效的 Meta 分析[J]. 康复学报, 2017, 27(4): 60-64. DOI: 10.3724/SP.J.1329.2017.04060.
- [112] Yang J, Zhou X, Ma Q, et al. Efficacy and safety of Tuina for chronic nonspecific low back pain: a PRISMA-compliant systematic review and meta-analysis [J]. *Medicine (Baltimore)*, 2023, 102(9): e33018. DOI: 10.1097/MD.00000000000033018.
- [113] Kumar S, Beaton K, Hughes T. The effectiveness of massage therapy for the treatment of nonspecific low back pain: a systematic review of systematic reviews [J]. *Int J Gen Med*, 2013, 6: 733-741. DOI: 10.2147/IJGM.S50243.
- [114] Coulter ID, Crawford C, Hurwitz EL, et al. Manipulation and mobilization for treating chronic low back pain: a systematic review and meta-analysis [J]. *Spine J*, 2018, 18(5): 866-879. DOI: 10.1016/j.spinee.2018.01.013.
- [115] Ruddock JK, Sallis H, Ness A, et al. Spinal manipulation vs sham manipulation for nonspecific low back pain: a systematic review and meta-analysis [J]. *J Chiropr Med*, 2016, 15(3): 165-183. DOI: 10.1016/j.jcm.2016.04.014.
- [116] 汪松林, 沈晓峰, 徐波, 等. 中药复方治疗椎间盘源性腰痛临床疗效 Meta 分析 [J]. 中国中医急症, 2022, 31(10): 1698-1703, 1712. DOI: 10.3969/j.issn.1004-745X.2022.10.002.
- [117] 葛健峰, 陈凤琴, 籍麟, 等. 身痛逐瘀汤治疗腰椎间盘突出症临床疗效 Meta 分析 [J]. 世界最新医学信息文摘(连续型电子期刊), 2020, 20(27): 24-27. DOI: 10.3969/j.issn.1671-3141.2020.27.010.
- [118] Godley E, Smith MA. Efficacy of acupressure for chronic low back pain: a systematic review [J]. *Complement Ther Clin Pract*, 2020, 39:101146. DOI: 10.1016/j.ctcp.2020.101146.
- [119] Xie G, Wang T, Tang X, et al. Acupoint injection for nonspecific chronic low back pain: a systematic review and meta-analysis of randomized controlled studies [J]. *Evid Based Complement Alternat Med*, 2020, 2020: 3976068. DOI: 10.1155/2020/3976068.
- [120] Migliorini F, Maffulli N, Eschweiler J, et al. The pharmacological management of chronic lower back pain [J]. *Expert Opin Pharmacother*, 2021, 22(1): 109-119. DOI: 10.1080/14656566.2020.1817384.
- [121] Price MR, Cupler ZA, Hawk C, et al. Systematic review of guideline-recommended medications prescribed for treatment of low back pain [J]. *Chiropr Man Therap*, 2022, 30(1): 26. DOI: 10.1186/s12998-022-00435-3.
- [122] Chung JW, Zeng Y, Wong TK. Drug therapy for the treatment of chronic nonspecific low back pain: systematic review and meta-analysis [J]. *Pain Physician*, 2013, 16(6): E685-E704.
- [123] Enthoven WT, Roelofs PD, Deyo RA, et al. Non-steroidal anti-inflammatory drugs for chronic low back pain [J]. *Cochrane Database Syst Rev*, 2016, 2(2): CD012087. DOI: 10.1002/14651858.CD012087.
- [124] Hirase T, Hirase J, Ling J, et al. Duloxetine for the treatment of chronic low back pain: a systematic review of randomized placebo-controlled trials [J]. *Cureus*, 2021, 13(5): e15169. DOI: 10.7759/cureus.15169.
- [125] Tucker HR, Scaff K, McCloud T, et al. Harms and benefits of opioids for management of non-surgical acute and chronic low back pain: a systematic review [J]. *Br J Sports Med*, 2020, 54(11): 664. DOI: 10.1136/bjsports-2018-099805.
- [126] Nury E, Schmucker C, Nagavci B, et al. Efficacy and safety of strong opioids for chronic noncancer pain and chronic low back pain: a systematic review and meta-analyses [J]. *Pain*, 2022, 163(4): 610-636. DOI: 10.1097/j.pain.0000000000002423.
- [127] Migliorini F, Maffulli N, Baroncini A, et al. Opioids for chronic low back pain management: a Bayesian network meta-analysis [J]. *Expert Rev Clin Pharmacol*, 2021, 14(5): 635-641. DOI: 10.1080/17512433.2021.1903316.
- [128] Song L, Qiu P, Xu J, et al. The effect of combination pharmacotherapy on low back pain: a meta-analysis [J]. *Clin J Pain*, 2018, 34(11): 1039-1046. DOI: 10.1097/AJP.0000000000000622.
- [129] Romanò CL, Romanò D, Lacerenza M. Antineuropathic and antinociceptive drugs combination in patients with chronic low back pain: a systematic review [J]. *Pain Res Treat*, 2012, 2012: 154781. DOI: 10.1155/2012/154781.
- [130] Mathieson S, Kasch R, Maher CG, et al. Combination drug therapy for the management of low back pain and sciatica: systematic review and meta-analysis [J]. *J Pain*, 2019, 20(1): 1-15. DOI: 10.1016/j.jpain.2018.06.005.
- [131] Tetsunaga T, Tetsunaga T, Tanaka M, et al. Efficacy of tramadol-acetaminophen tablets in low back pain patients with depression [J]. *J Orthop Sci*, 2015, 20(2): 281-286. DOI: 10.1007/s00776-014-0674-4.
- [132] Varrassi G, Hanna M, Coaccioli S, et al. DANTE study: the first randomized, double-blind, placebo and active-controlled, parallel arm group study evaluating the analgesic efficacy and safety of dextropropofol, tramadol and tramadol hydrochloride oral fixed dose combination on moderate to severe acute pain in patients with acute low back pain-rationale and design [J]. *Pain Ther*, 2022, 11(3): 1055-1070. DOI: 10.1007/s40122-022-00407-8.
- [133] Moore RA, Barden J. Systematic review of dextropropofol in acute and chronic pain [J]. *BMC Clin Pharmacol*, 2008, 8: 11. DOI: 10.1186/1472-6904-8-11.
- [134] Rossi M, Ianigro G, Liberatoscioli G, et al. Eperisone versus tizanidine for treatment of chronic low back pain [J]. *Minerva Med*, 2012, 103(3): 143-149. PMID: 22653094.
- [135] Bavage S, Durg S, Ali Kareem S, et al. Clinical efficacy and safety of eperisone for low back pain: a systematic literature review [J]. *Pharmacol Rep*, 2016, 68(5): 903-912. DOI: 10.1016/j.pharep.2016.05.003.
- [136] 章建新, 郑建平, 谢伟, 等. 替扎尼定治疗椎间盘源性腰痛患者的临床研究 [J]. 中国临床药理学杂志, 2021, 37(8): 970-973. DOI: 10.13699/j.cnki.1001-6821.2021.08.009.



- [137] Chou R, Deyo R, Friedly J, et al. Systemic pharmacologic therapies for low back pain: a systematic review for an american college of physicians clinical practice guideline [J]. *Ann Intern Med*, 2017, 166(7): 480-492. DOI: 10.7326/M16-2458.
- [138] Weng C, Xu J, Wang Q, et al. Efficacy and safety of duloxetine in osteoarthritis or chronic low back pain: a systematic review and meta-analysis [J]. *Osteoarthritis Cartilage*, 2020, 28(6): 721-734. DOI: 10.1016/j.joca.2020.03.001.
- [139] Hirase T, Hirase J, Ling J, et al. Duloxetine for the treatment of chronic low back pain: a systematic review of randomized placebo-controlled trials [J]. *Cureus*, 2021, 13(5): e15169. DOI: 10.7759/cureus.15169.
- [140] Petzke F, Klose P, Welsch P, et al. Opioids for chronic low back pain: an updated systematic review and meta-analysis of efficacy, tolerability and safety in randomized placebo-controlled studies of at least 4 weeks of double-blind duration [J]. *Eur J Pain*, 2020, 24(3): 497-517. DOI: 10.1002/ejp.1519.
- [141] Abdel Shaheed C, Maher CG, Williams KA, et al. Efficacy, tolerability, and dose-dependent effects of opioid analgesics for low back pain: a systematic review and meta-analysis [J]. *JAMA Intern Med*, 2016, 176(7): 958-968. DOI: 10.1001/jamainternmed.2016.1251.
- [142] Boya C, Bansal D, Kanakagiri S, et al. Efficacy and safety of opioid analgesics for the management of chronic low back pain: an evidence from bayesian network meta-analysis [J]. *Pain Physician*, 2021, 24(1): 73-82.
- [143] Lange B, Kuperwasser B, Okamoto A, et al. Efficacy and safety of tapentadol prolonged release for chronic osteoarthritis pain and low back pain [J]. *Adv Ther*, 2010, 27(6): 381-399. DOI: 10.1007/s12325-010-0036-3.
- [144] Buynak R, Shapiro DY, Okamoto A, et al. Efficacy and safety of tapentadol extended release for the management of chronic low back pain: results of a prospective, randomized, double-blind, placebo- and active-controlled phase III study [J]. *Expert Opin Pharmacother*, 2010, 11(11): 1787-1804. DOI: 10.1517/14656566.2010.497720.
- [145] Cloutier C, Taliano J, O'Mahony W, et al. Controlled-release oxycodone and naloxone in the treatment of chronic low back pain: a placebo-controlled, randomized study [J]. *Pain Res Manag*, 2013, 18(2): 75-82. DOI: 10.1155/2013/164609.
- [146] Miller K, Yarlal A, Wen W, et al. Buprenorphine transdermal system and quality of life in opioid-experienced patients with chronic low back pain [J]. *Expert Opin Pharmacother*, 2013, 14(3): 269-277. DOI: 10.1517/14656566.2013.767331.
- [147] Gordon A, Rashid S, Moulin DE, et al. Buprenorphine transdermal system for opioid therapy in patients with chronic low back pain [J]. *Pain Res Manag*, 2010, 15(3): 169-178. DOI: 10.1155/2010/216725.
- [148] Enke O, New HA, New CH, et al. Anticonvulsants in the treatment of low back pain and lumbar radicular pain: a systematic review and meta-analysis [J]. *CMAJ*, 2018, 190(26): E786-E793. DOI: 10.1503/cmaj.171333.
- [149] Tatit RT, Poetscher AW, Oliveira CAC. Pregabalin and gabapentin for chronic low back pain without radiculopathy: a systematic review [J]. *Arq Neuropsiquiatr*, 2023, 81(6): 564-576. DOI: 10.1055/s-0043-1764414.
- [150] 段晓峰, 闫峰, 何娇. 汉防己甲素片治疗坐骨神经痛患者的临床疗效 [J]. *中国临床保健杂志*, 2013, (5): 518-519. DOI: 10.3969/J.issn.1672-6790.2013.05.028.
- [151] 盛有根, 夏建洪, 徐海波. 热敏灸配合汉防己甲素经皮给药治疗腰椎间盘突出症的疗效观察 [J]. *上海针灸杂志*, 2018, 37(3): 320-323. DOI: 10.13460/j.issn.1005-0957.2018.03.0320.
- [152] 黄华生, 郭惠智, 刘腾, 等. 痹祺胶囊治疗腰椎间盘突出症的有效性及安全性的系统评价 [J]. *中医临床研究*, 2023, 15(3): 108-113. DOI: 10.3969/j.issn.1674-7860.2023.03.026.
- [153] 国家卫生健康委能力建设和继续教育中心疼痛病诊疗专项能力培训项目专家组. 中成药治疗慢性肌肉骨骼疼痛病中国指南(2023版) [J]. *中华疼痛学杂志*, 2023, 19(1): 6-12. DOI: 10.3760/cma.j.cn101658-20230213-00019.
- [154] Chen J, Zheng J, Chen M, et al. The efficacy and safety of chinese herbal medicine xianling gubao capsule combined with alendronate in the treatment of primary osteoporosis: a systematic review and meta-analysis of 20 randomized controlled trials [J]. *Front Pharmacol*, 2021, 12: 695832. DOI: 10.3389/fphar.2021.695832.
- [155] Cheng BR, Wu RY, Gao QY, et al. Chinese proprietary medicine xianling gubao capsule for osteoporosis: a systematic review and meta-analysis of randomized clinical trials [J]. *Front Endocrinol (Lausanne)*, 2022, 13: 870277. DOI: 10.3389/fendo.2022.870277.
- [156] Xie Y, Tu L, Zhang Y, et al. Efficacy and safety of Fengshi Gutong capsule in patients with active ankylosing spondylitis: a 4-week randomized controlled, double-blinded, double-dummy trial [J]. *J Ethnopharmacol*, 2022, 285: 114731. DOI: 10.1016/j.jep.2021.114731.
- [157] 徐洪海, 韩晓帆, 宋恒涛, 等. 通络祛痛膏对腰椎间盘突出症患者疗效观察 [J]. *世界最新医学信息文摘*, 2022, 22(22): 31-34. DOI: 10.3969/j.issn.1671-3141.2022.022.008.
- [158] 郝欣. 祛风骨痛凝胶膏治疗慢性腰背痛疗效观察 [J]. *养生大世界*, 2022, (22): 186-187. DOI: 10.3969/j.issn.1671-2269.2022.22.095.
- [159] 薛军丽, 索小清, 燕茹, 等. 祛风骨痛凝胶膏治疗慢性非特异性腰背痛的疗效观察 [J]. *世界最新医学信息文摘*, 2022, 22(95): 59-62. DOI: 10.3969/j.issn.1671-3141.2022.95.012.
- [160] 高仲谋. 丹鹿通督片治疗腰椎管狭窄症的临床观察 [J]. *中国伤残医学*, 2015, (19): 92-94. DOI: 10.13214/j.cnki.cjotadm.2015.19.069.
- [161] 多静. 丹鹿通督片治疗腰椎间盘突出症疗效观察 [J]. *中国现代药物应用*, 2015, (12): 241-242. DOI: 10.14164/j.cnki.cn11-5581/r.2015.12.163.
- [162] 王婷, 戴冀斌. 盘龙七片联合通督活血汤治疗风湿痹阻型腰椎



- 管狭窄症临床观察[J]. 中国药业, 2019, 28(2): 64-66. DOI: 10.3969/j.issn.1006-4931.2019.02.021.
- [163] 程延. 盘龙七片治疗寒湿型腰椎间盘突出症临床观察[J]. 中国中医骨伤科杂志, 2012, 20(8): 61-62.
- [164] 史光耀, 张文安, 董建文, 等. 活血止痛软胶囊治疗慢性软组织(气滞血瘀证)损伤多中心临床研究[J]. 中国民间疗法, 2018, 26(13): 30-32. DOI:10.19621/j.cnki.11-3555/r.2018.1318.
- [165] 覃剑, 程浩. 骨通贴膏配合中医定向透药治疗腰三横突综合征的临床研究[J]. 医学信息, 2016, 29(5): 191-192. DOI: 10.3969/j.issn.1006-1959.2016.05.148.
- [166] Day MA, Ward LC, Thorn BE, et al. Mechanisms of mindfulness meditation, cognitive therapy, and mindfulness-based cognitive therapy for chronic low back pain[J]. Clin J Pain, 2020, 36(10): 740-749. DOI: 10.1097/AJP.0000000000000862.
- [167] Day MA, Thorn BE, Ehde DM, et al. Moderators of mindfulness meditation, cognitive therapy, and mindfulness-based cognitive therapy for chronic low back pain: a test of the limit, activate, and enhance model[J]. J Pain, 2020, 21(1-2): 161-169. DOI: 10.1016/j.jpain.2019.06.006.
- [168] 罗浩月, 李秋芳, 赵燕利, 等. 基于网络的心理干预对慢性腰痛患者效果的Meta分析[J]. 中华护理杂志, 2023, 58(19): 2409-2415. DOI: 10.3761/j.issn.0254-1769.2023.19.016.
- [169] Ho EK, Chen L, Simic M, et al. Psychological interventions for chronic, non-specific low back pain: systematic review with network meta-analysis[J]. BMJ, 2022, (376): e067718. DOI: 10.1136/bmj-2021-067718.
- [170] Yang J, Lo WLA, Zheng F, et al. Evaluation of cognitive behavioral therapy on improving pain, fear avoidance, and self-efficacy in patients with chronic low back pain: a systematic review and meta-analysis[J]. Pain Res Manag, 2022, 2022: 4276175. DOI: 10.1155/2022/4276175.
- [171] Richmond H, Hall AM, Copsey B, et al. The Effectiveness of cognitive behavioural treatment for non-specific low back pain: a systematic review and meta-analysis[J]. PLoS One, 2015, 10(8): e0134192. DOI: 10.1371/journal.pone.0134192.
- [172] Hall A, Richmond H, Copsey B, et al. Physiotherapist-delivered cognitive-behavioural interventions are effective for low back pain, but can they be replicated in clinical practice? A systematic review[J]. Disabil Rehabil, 2018, 40(1): 1-9. DOI: 10.1080/09638288.2016.1236155.
- [173] Yang H, Wang X, Wang X, et al. Effect of mindfulness-based mind-body therapies in patients with non-specific low back pain-a network meta-analysis of randomized controlled trials[J]. Front Aging Neurosci, 2023, 15: 1148048. DOI: 10.3389/fnagi.2023.1148048.
- [174] Smith SL, Langen WH. A systematic review of mindfulness practices for improving outcomes in chronic low back pain[J]. Int J Yoga, 2020, 13(3): 177-182. DOI: 10.4103/ijoy.IJOY_4_20.
- [175] Soundararajan K, Prem V, Kishen TJ. The effectiveness of mindfulness-based stress reduction intervention on physical function in individuals with chronic low back pain: systematic review and meta-analysis of randomized controlled trials[J]. Complement Ther Clin Pract, 2022, 49: 101623. DOI: 10.1016/j.ctcp.2022.101623.
- [176] Cherkin DC, Sherman KJ, Balderson BH, et al. Effect of mindfulness-based stress reduction vs cognitive behavioral therapy or usual care on back pain and functional limitations in adults with chronic low back pain: a randomized clinical trial[J]. JAMA, 2016, 315(12): 1240-1249. DOI: 10.1001/jama.2016.2323.
- [177] Lin TH, Tam KW, Yang YL, et al. Meditation-based therapy for chronic low back pain management: a systematic review and meta-analysis of randomized controlled trials[J]. Pain Med, 2022, 23(10): 1800-1811. DOI: 10.1093/pm/pnac037.
- [178] Garcia LM, Birkhead BJ, Krishnamurthy P, et al. An 8-week self-administered at-home behavioral skills-based virtual reality program for chronic low back pain: double-blind, randomized, placebo-controlled trial conducted during covid-19[J]. J Med Internet Res, 2021, 23(2): e26292. DOI: 10.2196/26292.
- [179] Rohaj A, Bulaj G. Digital therapeutics (dtx) expand multimodal treatment options for chronic low back pain: the nexus of precision medicine, patient education, and public health[J]. Healthcare (Basel), 2023, 11(10): 1469. DOI: 10.3390/healthcare11101469.
- [180] Brea-Gómez B, Torres-Sánchez I, Ortiz-Rubio A, et al. Virtual reality in the treatment of adults with chronic low back pain: a systematic review and meta-analysis of randomized clinical trials[J]. Int J Environ Res Public Health, 2021, 18(22): 11806. DOI: 10.3390/ijerph182211806.
- [181] Herrero P, Ríos-Asín I, Lapuente-Hernández D, et al. The use of sensors to prevent, predict transition to chronic and personalize treatment of low back pain: a systematic review[J]. Sensors (Basel), 2023, 23(18): 7695. DOI: 10.3390/s23187695.
- [182] Choi T, Heo S, Choi W, et al. A systematic review and meta-analysis of the effectiveness of virtual reality-based rehabilitation therapy on reducing the degree of pain experienced by individuals with low back pain[J]. Int J Environ Res Public Health, 2023, 20(4): 3502. DOI: 10.3390/ijerph20043502.
- [183] Bordeleau M, Stamenkovic A, Tardif PA, et al. The use of virtual reality in back pain rehabilitation: a systematic review and meta-analysis[J]. J Pain, 2022, 23(2): 175-195. DOI: 10.1016/j.jpain.2021.08.001.
- [184] Lewkowicz D, Slosarek T, Wernicke S, et al. Digital therapeutic care and decision support interventions for people with low back pain: systematic review[J]. JMIR Rehabil Assist Technol, 2021, 8(4): e26612. DOI: 10.2196/26612.
- [185] Du S, Liu W, Cai S, et al. The efficacy of e-health in the self-management of chronic low back pain: a meta analysis[J]. Int J Nurs Stud, 2020, 106: 103507. DOI: 10.1016/j.ijnurstu.2019.103507.
- [186] Lara-Palomo IC, Gil-Martínez E, Ramírez-García JD, et al. Efficacy of e-health interventions in patients with chronic low-back pain: a systematic review with meta-analysis[J]. Telemed J E Health, 2022, 28(12): 1734-1752. DOI: 10.1089/tmj.



- 2021.0599.
- [187] Chen M, Wu T, Lv M, et al. Efficacy of mobile health in patients with low back pain: systematic review and meta-analysis of randomized controlled trials [J]. *JMIR Mhealth Uhealth*, 2021, 9 (6): e26095. DOI: 10.2196/26095.
- [188] de Melo Santana B, Raffin Moura J, Martins de Toledo A, et al. Efficacy of mhealth interventions for improving the pain and disability of individuals with chronic low back pain: systematic review and meta-analysis [J]. *JMIR Mhealth Uhealth*, 2023, 11: e48204. DOI: 10.2196/48204.
- [189] Rintala A, Rantalainen R, Kaksonen A, et al. mHealth apps for low back pain self-management: scoping review [J]. *JMIR Mhealth Uhealth*, 2022, 10(8): e39682. DOI: 10.2196/39682.
- [190] Coe-O'Brien R, Joseph L, Kuisma R, et al. Outcome measures used in the smartphone applications for the management of low back pain: a systematic scoping review [J]. *Health Inf Sci Syst*, 2020, 8(1): 5. DOI: 10.1007/s13755-019-0097-x.
- [191] Villatoro-Luque FJ, Rodríguez-Almagro D, Aibar-Almazán A, et al. In non-specific low back pain, is an exercise program carried out through telerehabilitation as effective as one carried out in a physiotherapy center? A controlled randomized trial [J]. *Musculoskelet Sci Pract*, 2023, 65:102765. DOI: 10.1016/j.msksp.2023.102765.
- [192] Özden F, Sarı Z, Karaman ÖN, et al. The effect of video exercise-based telerehabilitation on clinical outcomes, expectation, satisfaction, and motivation in patients with chronic low back pain [J]. *Ir J Med Sci*, 2022, 191(3): 1229-1239. DOI: 10.1007/s11845-021-02727-8.
- [193] Bise CG, Cupler Z, Mathers S, et al. Face-to-face telehealth interventions in the treatment of low back pain: a systematic review [J]. *Complement Ther Clin Pract*, 2023, 50: 101671. DOI: 10.1016/j.ctcp.2022.101671.
- [194] Olivier TJ, Konda C, Pham T, et al. Clinical practice guidelines on interventional management of low back pain: a synthesis of recommendations [J]. *PM R*, 2023, 15(8): 1052-1063. DOI: 10.1002/pmrj.12930.
- [195] Manchikanti L, Knezevic NN, Navani A, et al. Epidural interventions in the management of chronic spinal pain: American society of interventional pain physicians (ASIPP) comprehensive evidence-based guidelines [J]. *Pain Physician*, 2021, 24(S1): S27-S208. PMID: 33492918.
- [196] Manchikanti L, Cash KA, McManus CD, et al. A randomized, double-blind, active-controlled trial of fluoroscopic lumbar interlaminar epidural injections in chronic axial or discogenic low back pain: results of 2-year follow-up [J]. *Pain Physician*, 2013, 16 (5): E491-E504. PMID: 24077199.
- [197] Ghai B, Bansal D, Kay JP, et al. Transforaminal versus parasagittal interlaminar epidural steroid injection in low back pain with radicular pain: a randomized, double-blind, active-control trial [J]. *Pain Physician*, 2014, 17(4): 277-290. PMID: 25054387.
- [198] Manchikanti L, Cash KA, McManus CD, et al. One-year results of a randomized, double-blind, active controlled trial of fluoroscopic caudal epidural injections with or without steroids in managing chronic discogenic low back pain without disc herniation or radiculitis [J]. *Pain Physician*, 2011, 14(1): 25-36. PMID: 21267039.
- [199] Manchikanti L, Cash KA, Pampati V, et al. Transforaminal epidural injections in chronic lumbar disc herniation: a randomized, double-blind, active-control trial [J]. *Pain Physician*, 2014, 17(4): E489-E501. PMID: 25054399.
- [200] Meng H, Fei Q, Wang B, et al. Epidural injections with or without steroids in managing chronic low back pain secondary to lumbar spinal stenosis: a meta-analysis of 13 randomized controlled trials [J]. *Drug Des Devel Ther*, 2015, 9: 4657-4667. DOI: 10.2147/DDDT.S85524.
- [201] Singjie LC, Kusuma SA, Saleh I, et al. The potency of platelet-rich plasma for chronic low back pain: a systematic review and metaanalysis of randomized controlled trial [J]. *Asian Spine J*, 2023, 17(4): 782-789. DOI: 10.31616/asj.2022.0209.
- [202] Ruiz-Lopez R, Tsai YC. A randomized double-blind controlled pilot study comparing leucocyte-rich platelet-rich plasma and corticosteroid in caudal epidural injection for complex chronic degenerative spinal pain [J]. *Pain Pract*, 2020, 20(6): 639-646. DOI: 10.1111/papr.12893.
- [203] Baroncini A, Maffulli N, Eschweiler J, et al. Management of facet joints osteoarthritis associated with chronic low back pain: a systematic review [J]. *Surgeon*, 2021, 19(6): e512-e518. DOI: 10.1016/j.surge.2020.12.004.
- [204] Karkucak M, Batmaz İ, Kerimoglu S, et al. Comparison of clinical outcomes of ultrasonography-guided and blind local injections in facet syndrome: a 6-week randomized controlled trial [J]. *J Back Musculoskelet Rehabil*, 2020, 33(3): 431-436. DOI: 10.3233/BMR-181447.
- [205] Wu J, Zhou J, Liu C, et al. A prospective study comparing platelet-rich plasma and local anesthetic (la)/corticosteroid in intra-articular injection for the treatment of lumbar facet joint syndrome [J]. *Pain Pract*, 2017, 17(7): 914-924. DOI: 10.1111/papr.12544.
- [206] Machado ES, Soares FP, Vianna de Abreu E, et al. Systematic review of platelet-rich plasma for low back pain [J]. *Biomedicines*, 2023, 11(9): 2404. DOI: 10.3390/biomedicines11092404.
- [207] Xuan Z, Yu W, Dou Y, et al. Efficacy of platelet-rich plasma for low back pain: a systematic review and meta-analysis [J]. *J Neurol Surg A Cent Eur Neurosurg*, 2020, 81(6): 529-534. DOI: 10.1055/s-0040-1709170.
- [208] Sanapati J, Manchikanti L, Atluri S, et al. Do regenerative medicine therapies provide long-term relief in chronic low back pain: a systematic review and metaanalysis [J]. *Pain Physician*, 2018, 21(6): 515-540. PMID: 30508983.
- [209] Akeda K, Fujiwara T, Takegami N, et al. Retrospective analysis of factors associated with the treatment outcomes of intradiscal



- platelet-rich plasma-releasate injection therapy for patients with discogenic low back pain [J]. *Medicina (Kaunas)*, 2023, 59(4): 640. DOI: 10.3390/medicina59040640.
- [210] Ju DG, Kanim LE, Bae HW. Is there clinical improvement associated with intradiscal therapies? A comparison across randomized controlled studies [J]. *Global Spine J*, 2022, 12(5): 756-764. DOI: 10.1177/2192568220963058.
- [211] Sconza C, Leonardi G, Kon E, et al. Oxygen-ozone therapy for the treatment of low back pain: a systematic review of randomized controlled trials [J]. *Eur Rev Med Pharmacol Sci*, 2021, 25(19): 6034-6046. DOI: 10.26355/eurrev_202110_26881.
- [212] Andrade RR, Oliveira-Neto OB, Barbosa LT, et al. Efetividade da ozonioterapia comparada a outras terapias para dor lombar: revisão sistemática com metanálise de ensaios clínicos randomizados [Effectiveness of ozone therapy compared to other therapies for low back pain: a systematic review with meta-analysis of randomized clinical trials] [J]. *Braz J Anesthesiol*, 2019, 69(5): 493-501. DOI: 10.1016/j.bjan.2019.06.007.
- [213] Guo X, Ding W, Liu L, et al. Intradiscal methylene blue injection for discogenic low back pain: a meta-analysis [J]. *Pain Pract*, 2019, 19(1): 118-129. DOI: 10.1111/papr.12725.
- [214] Deng M, Huang H, Ma YG, et al. Intradiskal injection of methylene blue for discogenic back pain: a meta-analysis of randomized controlled trials [J]. *J Neurol Surg A Cent Eur Neurosurg*, 2021, 82(2): 161-165. DOI: 10.1055/s-0040-1721015.
- [215] Kim WM, Lee HG, Jeong CW, et al. A randomized controlled trial of intra-articular prolotherapy versus steroid injection for sacroiliac joint pain [J]. *J Altern Complement Med*, 2010, 16(12): 1285-1290. DOI: 10.1089/acm.2010.0031.
- [216] Goodwin B, Averell N, Al-Shehab U, et al. Efficacy of platelet-rich plasma for sacroiliac joint dysfunction: a qualitative systematic review with pooled analysis [J]. *Regen Med*, 2023, 18(6): 505-514. DOI: 10.2217/rme-2022-0211.
- [217] Chen AS, Solberg J, Smith C, et al. Intra-articular platelet rich plasma vs corticosteroid injections for sacroiliac joint pain: a double-blinded, randomized clinical trial [J]. *Pain Med*, 2022, 23(7): 1266-1271. DOI: 10.1093/pm/pnab332.
- [218] Singla V, Batra YK, Bharti N, et al. Steroid vs. platelet-rich plasma in ultrasound-guided sacroiliac joint injection for chronic low back pain [J]. *Pain Pract*, 2017, 17(6): 782-791. DOI: 10.1111/papr.12526.
- [219] Li WS, Yan Q, Cong L. Comparison of endoscopic discectomy versus non-endoscopic discectomy for symptomatic lumbar disc herniation: a systematic review and meta-analysis [J]. *Global Spine J*, 2022, 12(5): 1012-1026. DOI: 10.1177/21925682211020696.
- [220] Noriega D, Marcia S, Theumann N, et al. A prospective, international, randomized, noninferiority study comparing an implantable titanium vertebral augmentation device versus balloon kyphoplasty in the reduction of vertebral compression fractures (SAKOS study) [J]. *Spine J*, 2019, 19(11): 1782-1795. DOI: 10.1016/j.spinee.2019.07.009.
- [221] Li H, An J, Zhang J, et al. Comparative efficacy of radiofrequency denervation in chronic low back pain: a systematic review and network meta-analysis [J]. *Front Surg*, 2022, 9: 899538. DOI: 10.3389/fsurg.2022.899538.
- [222] Janapala RN, Manchikanti L, Sanapati MR, et al. Efficacy of radiofrequency neurotomy in chronic low back pain: a systematic review and meta-analysis [J]. *J Pain Res*, 2021, 14: 2859-2891. DOI: 10.2147/JPR.S323362.
- [223] Abrishamkar S, Kouchakzadeh M, Mirhosseini A, et al. Comparison of open surgical discectomy versus plasma-laser nucleoplasty in patients with single lumbar disc herniation [J]. *J Res Med Sci*, 2015, 20(12): 1133-1137. DOI: 10.4103/1735-1995.172979.
- [224] van Tilburg CW, Schuurmans FA, Stronks DL, et al. Randomized sham-controlled double-blind multicenter clinical trial to ascertain the effect of percutaneous radiofrequency treatment for sacroiliac joint pain: three-month results [J]. *Clin J Pain*, 2016, 32(11): 921-926. DOI: 10.1097/AJP.0000000000000351.
- [225] Mekhail N, Eldabe S, Templeton E, et al. Pain management interventions for the treatment of chronic low back pain: a systematic review and meta-analysis [J]. *Clin J Pain*, 2023, 39(7): 349-364. DOI: 10.1097/AJP.0000000000001116.
- [226] Fischgrund JS, Rhyne A, Franke J, et al. Intraosseous basivertebral nerve ablation for the treatment of chronic low back pain: a prospective randomized double-blind sham-controlled multi-center study [J]. *Eur Spine J*, 2018, 27(5): 1146-1156. DOI: 10.1007/s00586-018-5496-1.
- [227] Eckermann JM, Pilitsis JG, Vannaboutathong C, et al. Systematic literature review of spinal cord stimulation in patients with chronic back pain without prior spine surgery [J]. *Neuromodulation*, 2021. DOI: 10.1111/ner.13519.
- [228] Karri J, Orhurhu V, Wahezi S, et al. Comparison of spinal cord stimulation waveforms for treating chronic low back pain: systematic review and meta-analysis [J]. *Pain Physician*, 2020, 23(5): 451-460. PMID: 32967388.
- [229] Hayek SM, Jones BA, Veizi E, et al. Efficacy of continuous intrathecal infusion trialing with a mixture of fentanyl and bupivacaine in chronic low back pain patients [J]. *Pain Med*, 2023, 24(7): 796-808. DOI: 10.1093/pm/pnac195.
- [230] Gilligan C, Volschenk W, Russo M, et al. An implantable restorative-neurostimulator for refractory mechanical chronic low back pain: a randomized sham-controlled clinical trial [J]. *Pain*, 2021, 162(10): 2486-2498. DOI: 10.1097/j.pain.0000000000002258.
- [231] D'Souza RS, Jin MY, Abd-Elsayed A. Peripheral nerve stimulation for low back pain: a systematic review [J]. *Curr Pain Headache Rep*, 2023, 27(5): 117-128. DOI: 10.1007/s11916-023-01109-2.
- [232] Stefanova I, Currie AC, Newton RC, et al. A meta-analysis of the impact of bariatric surgery on back pain [J]. *Obes Surg*, 2020, 30



- (8): 3201-3207. DOI: 10.1007/s11695-020-04713-y.
- [233] Steffens D, Maher CG, Pereira LS, et al. Prevention of low back pain: a systematic review and meta-analysis [J]. JAMA Intern Med, 2016, 176(2): 199-208. DOI: 10.1001/jamainternmed. 2015. 7431.
- [234] Zhang TT, Liu Z, Liu YL, et al. Obesity as a risk factor for low back pain: a meta-analysis [J]. Clin Spine Surg, 2018, 31(1): 22-27. DOI: 10.1097/BSD.0000000000000468.
- [235] Shiri R, Falah-Hassani K. Does leisure time physical activity protect against low back pain? Systematic review and meta-analysis of 36 prospective cohort studies [J]. Br J Sports Med, 2017, 51(19): 1410-1418. DOI: 10.1136/bjsports-2016-097352.
- [236] Hernandez-Lucas P, Leirós-Rodríguez R, Lopez-Barreiro J, et al. Is the combination of exercise therapy and health education more effective than usual medical care in the prevention of non-specific back pain? A systematic review with meta-analysis [J]. Ann Med, 2022, 54(1): 3107-3116. DOI: 10.1080/07853890.2022.2140453.
- [237] Hernandez-Lucas P, Leirós-Rodríguez R, Lopez-Barreiro J, et al. Prevention of non-specific back pain through exercise and education: a systematic review and meta-analysis [J]. J Back Musculoskelet Rehabil, 2023. DOI: 10.3233/BMR-230252.
- [238] Pergolizzi JV Jr, LeQuang JA. Rehabilitation for low back pain: a narrative review for managing pain and improving function in acute and chronic conditions [J]. Pain Ther, 2020, 9(1): 83-96. DOI: 10.1007/s40122-020-00149-5.
- [239] Hayden JA, Wilson MN, Riley RD, et al. Individual recovery

expectations and prognosis of outcomes in non-specific low back pain: prognostic factor review [J]. Cochrane Database Syst Rev, 2019, 2019(11): CD011284. DOI: 10.1002/14651858.CD011284.pub2.

(收稿日期:2024-02-15)

(本文编辑:吴振华)

执笔者简介

程志祥,男,1972年7月出生,博士学位,主任医师,硕士研究生导师,南京医科大学第二附属医院疼痛科主任;专业特长:慢性疼痛诊疗;研究方向:体外冲击波疗法临床应用、富血小板血浆临床应用及数字疗法在慢性疼痛治疗中应用。

通信作者简介

刘延青,男,1957年10月出生,硕士,主任医师、教授,现任全国疼痛病学继续教育培训学院院长。中华医学会疼痛学分会前任主任委员,中国老年保健协会疼痛病学会会长,《中华疼痛学杂志》副总编,《中国疼痛医学杂志》副主编,国家卫健委疼痛病诊疗专项能力培训项目专家组组长,全国继续医学教育委员会专家组成员。2017年获得人民网组织评选的“国家名医—卓越建树”称号。

从事慢性疼痛病诊疗工作30余年。主编人卫版《实用疼痛学》《疼痛病学诊疗手册》系列丛书,参编专著11本,发表论文90余篇,获省部级科技进步奖2项,局级科技奖7项。1999年被评为北京市卫生系统先进个人。2002年荣获首都五一劳动奖章。

本文引用格式

国家卫生健康委能力建设和继续教育中心疼痛病诊疗专项能力提升项目专家组. 中国慢性腰背痛诊疗指南(2024版)[J]. 中华疼痛学杂志, 2024, 20(1): 4-22. DOI: 10.3760/cma.j.cn101658-20240215-00017.

中华医学会

