

中国医学物理学杂志

CHINESE JOURNAL OF MEDICAL PHYSICS

月刊 1984年创刊 2021年03月25日第38卷第3期(总第212期)



主 管  
南方医科大学

主 办  
南方医科大学  
中国医学物理学会

编 辑  
《中国医学物理学杂志》编委会

主 编  
胡逸民

编辑部主任  
卢广文

出 版  
《中国医学物理学杂志》编辑部

通讯地址  
广州市同和南方医科大学  
生物医学工程学院  
电话:020-61648280  
传真:020-61360581  
邮编:510515  
网址:www.cjomp.com  
E-mail:YXWL@263.net.cn  
微信号:cjomp001

印 刷  
广州市艺彩印务有限公司

国内订阅  
全国各地邮政局  
邮发代号: 46-259

国外订阅  
中国出版对外贸易总公司  
(北京782信箱)

国外发行代号  
DK44009

邮 购  
《中国医学物理学杂志》编辑部

定 价  
每册15.00元;全年180.00元

中国标准连续出版物号  
ISSN 1005-202X  
CN 44-1351/R

目 次

医学放射物理

基于先验知识的头颈部肿瘤调强放疗计划多目标优化方法  
..... 刘劲光,刘国才(265)

应用4DCT测量老年食管癌患者放疗引发的肺通气功能变化  
.....沈建军,牛维纳,闫冰,余泉,解远(277)

左侧乳腺癌术后放疗无均整器模式剂量学优势分析  
..... 罗红樱,周剑良,单国平,邵凯南,杨一威,周霞(281)

基于临床质子加速器的DeepPlan笔形束模型构建  
..... 张增鹏,陶寅,刘红冬,陈志,徐榭,裴曦(287)

宫颈癌术后调强放疗摆位误差对靶区累积剂量偏差的影响  
.....欧阳水根,郭晴,刘婷婷,陶娜,成坚强,  
安永伟,魏玺仪,陶发利,牛瑞军(295)

两种准直器宽度对鼻咽癌放疗中的剂量学差异影响  
..... 马天斌,蒋振东,俞海东,张汉雄,胡丹,陈意标(302)

基于红外定位系统的激光灯摆位精度研究  
..... 王达飞,黄新阳,许益芬,朱国民,陈胜东,葛云(308)

CT扫描电压与CT值-相对电子密度值转换曲线不匹配对放疗计划剂量的影响  
..... 孔繁图,陈露茜,金锦辉,董洁,贺亚迪,李政欢(312)

医学影像物理

基于分步目标定位的腰椎间盘突出自动诊断方法  
.....巩稼民,杨红蕊,郭庆庆,蒋杰伟,潘琼,马豆豆,高燕军(317)

基于参考图像的压缩感知磁共振扩散张量成像  
.....刘良友,李兆同,张泽茹,夏一帆,高嵩(323)

DoseLab软件检测CT图像噪声的程序改进及应用分析  
.....时飞跃,王敏,秦伟,赵环宇,魏晓为(327)

超声联合ABPM评估老年高血压患者早期肾损害的价值  
..... 代静澜,华蕾,李朵,牟海刚(331)

超声多模态技术对非哺乳期乳腺炎与乳腺癌的鉴别诊断价值  
..... 闵洁,蒋殿虎,彭国平,曾书娥(337)

磁共振联合磁敏感加权成像评估急性脑梗死的临床价值  
..... 张海燕,谭秀革,陈奕菲,于春祥(340)

医学信号处理与医学仪器

多参数运动心肺功能测试系统的初步应用 .....刘杰,叶继伦,文斌,袁懋结(344)

医学生物物理

穴位贴敷联合经皮穴位电刺激对腹腔镜术后胃肠蠕动功能的影响 .....周敏,蔡懿婷,庞文璟(350)  
低强度脉冲超声通过PI3K/AKT/mTOR信号通路抑制骨肉瘤细胞的增殖 ...张宇,马成华,景鹏举,李培武(355)

生物力学与材料

基于CT影像的骨质疏松性胸腰椎压缩骨折PKP术后三维有限元力学模型的建立与验证  
.....权祯,张晓刚,秦太平,宋敏,张华,张宏伟,赵希云,王志鹏,马涛,陈钵(360)  
基于CT和MRI膝关节有限元模型建立与不同载荷下生物力学特性分析  
.....杭声琪,张文韬,王泰淇,任建澄,李富超,赵改平,马童(370)  
生物力学影响的靶区位姿精度保持方法研究 .....李瑞星,张来喜,陈惠贤,宋明涛,雷武乐,张鹏(375)

脑科学与神经物理

基于独立成分分析的遗尿症儿童脑功能网络研究 .....刘越,王梦星,杜小霞,张安易,马骏,何培忠(382)

医学人工智能

基于密度分布特征及机器学习诊断COVID-19相关性肺炎  
.....韩冬,于勇,贺太平,段海峰,贾永军,张喜荣,郭佑民,于楠(387)

其他

医院放射防护能力量表的编制及信效度检验 .....张容,赖晶(392)

责任编辑:黄开颜  
责任校对:薛泽玲 陈丽霞 谭斯允  
英语校对:谭斯允  
编 务:廖艳玲

期刊基本参数:CN44-1351/R \* 1984 \* M \* A4 \* 136 \* zh \* P \* ¥ 15.0 \* 800 \* 23 \* 2021-03

**Responsible Institution**

Southern Medical University

**Sponsored by**Southern Medical University  
Chinese Society of Medical Physics**Edited by**Editorial Board of Chinese  
Journal of Medical Physics**Editor-in-Chief**

HU Yimin

**Editorial Director**

LU Guangwen

**Published by**Editorial Department of Chinese  
Journal of Medical Physics**Address**School of Biomedical Engineering,  
Southern Medical University,  
Tonghe, Guangzhou  
Postal code: 510515  
Tel: 86-20-61648280  
Fax: 020-61360581  
Http://www.cjomp.com  
E-mail: YXWL@263.net.cn  
Wechat: cjomp001**Printed by**Guangzhou Yi Cai Printing  
Co., Ltd**Domestic Subscription**Post offices all over China  
Post office subscription code:  
46-259**Overseas Subscription**China National Publishing  
Industry Trading Corporation  
(P.O.Box. 782, Beijing, China)**Mail Order**Editorial Department of Chinese  
Journal of Medical Physics**China Standard Serial Numbering**ISSN 1005-202X  
CN 44-1351/R**CONTENTS****Medical radiation physics**Prior knowledge-based multi-objective optimization method for intensity-modulated radiotherapy  
planning of head and neck cancer.....(265)

LIU Jingguang, LIU Guocai

Measurement of pulmonary ventilation in elderly patients with esophageal cancer by 4DCT  
.....(277)

SHEN Jianjun, NIU Weina, YAN Bing, YU Xiao, XIE Yuan

Dosimetric advantages of postoperative radiotherapy in flattening filter-free mode for left-sided  
breast cancer .....(281)

LUO Hongying, ZHOU Jianliang, SHAN Guoping, SHAO Kainan, YANG Yiwei, ZHOU Xia

Construction of pencil beam model in DeepPlan based on clinical proton accelerator .....(287)

ZHANG Zengpeng, TAO Yin, LIU Hongdong, CHEN Zhi, XU Xie, PEI Xi

Effects of setup errors in postoperative intensity-modulated radiotherapy of cervical cancer on  
cumulative target dose deviation .....(295)OUYANG Shuigen, GUO Qing, LIU Tingting, TAO Na, CHENG Jianqiang, AN Yongwei, WEI  
Xiyi, TAO Fali, NIU RuijunMultileaf collimators of two different leaf widths in radiotherapy of nasopharyngeal  
carcinoma: a dosimetric comparison .....(302)

MA Tianbin, JIANG Zhendong, YU Haidong, ZHANG Hanxiong, HU Dan, CHEN Yibiao

Setup accuracy of laser system: a study based on optical positioning system .....(308)

WANG Dafei, HUANG Xinyang, XU Yifen, ZHU Guomin, CHEN Shengdong, GE Yun

Effects of mismatch between CT scanning voltage and CT-RED conversion curve on radiotherapy  
dose .....(312)

KONG Fantu, CHEN Luqian, JIN Jinhui, DONG Jie, HE Yadi, LI Zhenghuan

**Medical imaging physics**Automatic diagnosis of lumbar intervertebral disc herniation based on step-by-step target positioning  
.....(317)GONG Jiamin, YANG Hongrui, GUO Qingqing, JIANG Jiewei, PAN Qiong, MA Doudou,  
GAO Yanjun

Compressed sensing diffusion tensor imaging based on reference image .....(323)

LIU Liangyou, LI Zhaotong, ZHANG Zeru, XIA Yifan, GAO Song

Improvement of DoseLab software program for CT image noise measurement and its application  
.....(327)

SHI Feiyue, WANG Min, QIN Wei, ZHAO Huanyu, WEI Xiaowei

Value of ultrasound combined with ABPM in evaluating early renal damages in elderly hypertensive  
patients .....(331)

DAI Jinglan, HUA Lei, LI Duo, MOU Haigang

Multimodal ultrasound in the differential diagnosis of non-lactation mastitis and breast cancer  
.....(337)

MIN Jie, JIANG Dianhu, PENG Guoping, ZENG Shu'e

Clinical value of MRI combined with SWI in evaluating acute cerebral infarction .....(340)

ZHANG Haiyan, TAN Xiuge, CHEN Yifei, YU Chunxiang

## Medical signal processing and medical devices

- Preliminary application of multi-parameter cardiopulmonary exercise test system .....(344)  
LIU Jie, YE Jilun, WEN Bin, YUAN Maojie

## Medical biophysics

- Effects of acupoint application combined with transcutaneous acupoint electrical stimulation on gastrointestinal peristalsis after laparoscopic surgery .....(350)  
ZHOU Min, CAI Yiting, PANG Wenjing
- Low-intensity pulsed ultrasound inhibits the proliferation of osteosarcoma cells through PI3K/AKT/mTOR signaling pathway .....(355)  
ZHANG Yu, MA Chenghua, JING Pengju, LI Peiwu

## Biomechanics and materials

- CT image-based establishment and verification of three-dimensional finite element biomechanical model for osteoporotic thoracolumbar compression fracture after percutaneous kyphoplasty .....(360)  
QUAN Zhen, ZHANG Xiaogang, QIN Daping, SONG Min, ZHANG Hua, ZHANG Hongwei, ZHAO Xiyun, WANG Zhipeng, MA Tao, CHEN Bo
- Establishment of finite element model of knee joint based on CT and MRI and analysis of biomechanical characteristics under different loads .....(370)  
HANG Shengqi, ZHANG Wentao, WANG Taiqi, REN Jiancheng, LI Fuchao, ZHAO Gaiping, MA Tong
- Ensuring target positioning accuracy under biomechanical effects .....(375)  
LI Ruixing, ZHANG Laixi, CHEN Huixian, SONG Mingtao, LEI Wule, ZHANG Peng

## Brain science and neurophysics

- Brain functional network of pediatric patients with enuresis: a research based on independent component analysis .....(382)  
LIU Yue, WANG Mengxing, DU Xiaoxia, ZHANG Anyi, MA Jun, HE Peizhong

## Medical artificial intelligence

- Diagnosis of COVID-19 associated pneumonia based on density distribution features and machine learning .....(387)  
HAN Dong, YU Yong, HE Taiping, DUAN Haifeng, JIA Yongjun, ZHANG Xirong, GUO Youmin, YU Nan

## Other

- Hospital occupational radiological protection ability scale: compilation, validity and reliability .....(392)  
ZHANG Rong, LAI Jing

**Executive Editor:** HUANG Kaiyan

**Executive Proofreaders:** XUE Zeling      CHEN Lixia      TAN Siyun

**English Editor:** TAN Siyun

**Editorial Assistant:** LIAO Yanling