

· 综述 ·

围手术期加速康复理念在漏斗胸中的应用进展



全文二维码

胡梦琰 戚继荣

南京医科大学附属儿童医院心胸外科, 南京 210008

通信作者:戚继荣, Email: qjr7@163.com

【摘要】 加速康复外科(enhanced recovery after surgery, ERAS)理念在成人外科领域已得到推广并取得良好效果。近年来 ERAS 理念被引入小儿外科,但由于儿童疾病谱的特殊性以及麻醉、手术的耐受性与成人不同,ERAS 在儿童外科的应用面临挑战。就漏斗胸而言,患儿围手术期的疼痛、腹胀、心理或进食障碍等,严重影响手术后的加速康复;同时漏斗胸患儿往往年龄偏大,在临床处理上更接近成人,因此,能否借鉴成人外科在 ERAS 方面的经验用于漏斗胸患儿的围手术期加速康复,是近年来国内外关注的热点。本文就儿童漏斗胸围手术期镇痛、心理疏导以及术后加速康复策略进行综述。

【关键词】 漏斗胸/外科学; 漏斗胸/康复; 围手术期医护/方法; 加速康复外科

基金项目: 青海省自然科学基金(2021-ZJ-751)

DOI:10.3760/cma.j.cn101785-202002009-016

Research advances in enhanced recovery after surgery for pediatric pectus excavatum during perioperative period

Hu Menglong, Qi Jirong

Department of Cardiothoracic Surgery, Affiliated Children's Hospital, Nanjing Medical University, Nanjing 210008, China

Corresponding author: Qi Jirong, Email: qjr7@163.com

【Abstract】 Enhanced recovery after surgery (ERAS) has been popular during adult surgery. Recently people have shifted their attention to children. Children's special disease spectrum and tolerance to anesthesia and surgery are different from those of adults. Thus it has challenged the focus of ERAS approach. The incidence of adverse reactions such as pain, bloating, psychological or eating disorders remains high during perioperative period of surgery for pediatric pectus excavatum (PE). Thus postoperative recovery is poor. Also PE children tend to be older and closer to adults in clinical management. Whether it can learn from the experience of adult surgery in ERAS and promote the accelerated rehabilitation of pediatric PE is a hot topic in recent years. This review summarized the concrete steps of promoting accelerated rehabilitation during perioperative period of pediatric PE in terms of analgesia, psychological counseling and postoperative rehabilitation.

【Key words】 Funnel Chest/SU; Funnel Chest/RH; Perioperative Care/MT; Enhanced Recovery After Surgery

Fund program: Natural Science Foundation of Qinghai Province (2021-ZJ-751)

DOI:10.3760/cma.j.cn101785-202002009-016

漏斗胸是常见的先天性胸壁畸形之一,每 1 000 名活产婴儿中有 1~8 人患病,男女发病率约为 4:1^[1-2]。患儿主要表现为凹胸、凸肚、驼背,畸形可压迫心肺^[3]。加速康复外科技术是一种多学科参与的多模式围手术期处理方法,通过减轻术后患儿应激反应以维持机体的生理稳态,并最大限度减少手术对身体的不良影响,进而促进患儿快速康复^[4-5]。加速康复外科理念为胸壁畸形患儿的一系列围手术期问题提供了最优解决方案^[6]。目前 ERAS 的关注重点在于围手术期健康教育、麻醉方式选择、围手术期镇痛、微创

手术技术、心理疏导等。近期国内研究证实部分现行 ERAS 技术可显著改善漏斗胸患儿的术后康复质量^[7]。本文就儿童漏斗胸围手术期宣教及评估、镇痛、术后加速康复技术的应用进展进行综述。

一、围手术期宣教及评估

(一) 健康宣教

与传统的术前健康宣教相比,ERAS 倡导的多元化健康教育为包括口头宣教、文书宣教、动作示范、多媒体宣教等多种方式相结合的个体化宣教方案。在儿童患者中,可以通过

游戏、视频、宣传手册、参观手术室、模拟麻醉过程、允许患儿使用常用的医疗设备等方式,创造对手术环境的熟悉感,缓解患儿及家属的紧张情绪和心理压力^[8-10]。目前临床上还可通过3D打印技术告知患儿及家属手术方案及术后改变、也与同病房患儿对照、通过术前术后照片或分享既往成功案例,增强患儿对治疗的信心和配合度^[11]。

(二) 心理健康评估

Li等^[12]研究发现,漏斗胸患儿因胸部畸形在术前普遍存在不同程度的心理问题,主要表现为社交困难、自卑、情绪不稳定。Luo等^[13]对266例漏斗胸患儿进行围术期心理评估,发现患儿术前存在不同程度的行为障碍,其行为和心理问题在手术矫治后得到了明显改善。谭小莉等^[14]对49例行NUSS术后的患儿进行2周的认知行为干预,与对照组相比,干预组患儿的自我效能评分、焦虑情绪障碍评分、抑郁评分改善更为显著。因此在围术期对患儿进行心理评估及指导干预可以促进术后恢复,符合加速康复理念。

针对漏斗胸患儿的心理评估方式,Luo等^[13]研究显示,4~16岁儿童可以使用儿童行为量表(child behavior check list, CBCL),而针对16岁以上漏斗胸患儿建议使用症状自评量表(symptom checklist 90, SCL-90)^[11]。Wildemeersch等^[15]推荐12~18岁患儿使用有效的网络心理问卷,如医院焦虑抑郁量表(hospital anxiety and depression scale, HADS)或状态-特质焦虑量表(state-trait anxiety inventory, STAI)、罗森伯格自尊量表(rosenberg self-esteem scale, RSES)。

(三) 营养风险评估

由于漏斗胸患儿常常合并营养不良和生长发育迟缓,存在高度营养风险,且与畸形程度呈正相关^[3]。手术矫治可明显改善漏斗胸患儿的营养状况,合理的围术期营养支持如术前高蛋白饮食,有助于改善患儿在疾病治疗期的耐受性和远期预后,有效降低营养风险^[16]。对术前患儿可进行快速营养风险筛查,如采用儿科营养不良筛查工具(screening tool for the assessment of malnutrition in pediatrics, STAMP)对临床诊断、营养摄入及人体测量学指标等进行评估,对高度营养风险组患儿应先进行一段时间的营养支持^[17]。

(四) 术前准备

在术前准备工作中,通过健康教育可以获得患儿一定程度的配合。Wharton等^[18]鼓励ERAS患儿每日早晚进行10 min胸部及背部肌肉的伸展练习,比非ERAS患儿更有利于手术的顺利进行;同时进行适当运动有助于术后呼吸功能的恢复。术前3 d开始口服聚乙二醇,在促进患儿肠道清洁的同时可预防术后便秘^[18]。中国麻醉学会推荐麻醉前2 h饮用无渣清饮料,饮用量≤5 mL/kg,避免患儿因禁食时间过长引起口渴和饥饿,导致患儿哭闹或烦躁,出现低血糖、发热、脱水等症状,增加并发症的发生风险^[19]。

二、围手术期镇痛

多模式麻醉和镇痛是ERAS极为重要的一部分,通过对外周和中枢神经系统不同位置施用两种及以上药物,可有效阻断疼痛感知,减少阿片类药物的消耗、术后慢性疼痛发生

以及术后并发症等^[20]。

(一) 药物镇痛

在国外,儿童心胸麻醉师多采用胸段硬膜外镇痛(thoracic epidural analgesia, TEA)或椎旁阻滞(para-vertebral block, PVB)作为基础麻醉,再结合局部区域麻醉的方法。也有少数医生使用肋间神经阻滞或其他区域技术,如前锯肌平面阻滞(serratus anterior plane block, SAPB)、竖脊肌平面阻滞(erector spinae plane block, ESPB)等^[21-24]。国内儿童麻醉医生使用吸入麻醉复合静脉注射麻醉或术中全麻结合切口局部麻醉。前者由于吸入麻醉易于控制,较为安全有效;后者可以有效减轻术后早期切口疼痛,加上术后外周静脉镇痛泵的使用,可减轻术后疼痛及其引发的相关不良反应,加快康复进程。Thaker等^[25]研究发现,双侧皮下导管(On-Q®)泵镇痛也是一种安全有效的方法,尽管对漏斗胸患儿术后疼痛控制效果可能不一定优于TEA,但其能缩短术后住院时间,且不增加术后并发症。

(二) 其他镇痛

Graves等^[26]研究发现,冷冻镇痛技术较TEA更能明显缩短术后住院时间。其机制为在NUSS钢板安装前,经电视辅助胸腔镜手术(video-assisted thoracic surgery, VATS)放置冷冻探针,进行肋间神经的冷冻镇痛,可在辅助术前麻醉的同时达到术后镇痛的效果,但由于出现个别长期感觉麻木的案例,临床上还需要更多实践来证明其可靠性和安全性。Lobe等^[27]对围术期催眠镇痛效果的研究发现,催眠组患儿的住院时间短于非催眠组(2.8 d比4.6 d),且可以减少催眠组患儿静脉注射麻醉药的使用。催眠组口服镇痛药可以更好地减轻术后不适,且目前尚没有相关副作用的报道。

三、微创手术

儿童漏斗胸手术已从传统Ravitch手术进展为NUSS手术,手术创伤从原先创伤极大的肋骨切断和胸骨翻转,改为侧胸壁入路,不游离皮肌瓣,切口小且外形美观,出血量少,手术时间也较传统手术明显缩短,同时保持胸廓的完整性,有利于术后呼吸功能的稳定^[28]。

在NUSS手术早期,外科医生应用弯血管钳钝性分离胸骨后和心包前方间隙,凭借感觉操作而没有视觉引导,因此有研究表明NUSS手术有导致严重心肺并发症的可能(4.2%),其中包括病死率较高的术中心脏穿孔^[29]。随着医疗水平的提高,胸腔镜在NUSS手术应用、NUSS手术的安全性上得到了极大提高,术中纵隔、肺、膈肌或腹腔损伤,术后严重并发症的发生概率也显著降低^[30]。研究表明,虽然VATS术后早期并发症总发生率为35.6%,但大多数(68.8%)为一过性气胸,可自行消退。根据Clavien-Dindo外科并发症分类,大多数术后并发症可以定义为I级,无需临床处理^[31]。

唐林晨等^[32]比较了非胸腔镜辅助下两切口NUSS手术与胸腔镜辅助改良NUSS手术,结果发现前者在胸膜外进行手术,避免了额外的胸膜腔损伤,无人造气胸,术后不放置胸腔引流管,同时简化了手术步骤,减轻患儿经济负担,并且认为只要熟练掌握操作技巧,非胸腔镜辅助下改良NUSS手术

矫正漏斗胸甚至具有更好的术后效果,更符合 ERAS 理念,可作为一种安全有效的手术方法在临床推广应用。

近年来大量改良技术被应用,商宏伟等^[33]认为双向加压和完全固定矫形板系统由于无需钢丝固定,在避免钢丝相关并发症的同时,矫形板可随胸壁运动而不限制胸廓起伏,患儿术后疼痛明显减轻,有助于早期活动。此外,只需在剑突下做切口,在胸廓外表面放置一条较短的矫形板,通过胸骨钢丝将凹陷部位提起,从矫形板中部将其固定在胸骨上;该方法安全性高,不限制患儿生长发育,适用于 NUSS 手术失败或复发患儿以及先天性心脏病术后心脏与胸壁有紧密粘连者。

四、术后康复训练

术后早期活动有利于缓解麻醉后胃肠道反应。患儿术后 2 h 可以饮水,术后 4~6 h 即可在医护人员指导下进行深呼吸训练,年幼儿可采取吹气球等活动帮助肺扩张,完全清醒后鼓励先进食流质,24 h 后可鼓励自主肢体活动或取半坐位,在床上进行自主活动,术后第 2 天即可鼓励患儿下床活动,活动量由小到大,可减轻腹胀、腹痛症状,使首次肛门排气、排便时间提前,有助于减少术后疼痛^[28,33]。同时在术后基于 QoR-15 评分系统(15-item Quality of Recovery, QoR-15)评估患儿早期恢复质量,根据患儿的各项得分和评分结果,调整个性化的治疗方案^[34]。

五、目标和展望

加速康复外科治疗漏斗胸的目标是,减轻术后疼痛,加强围术期营养支持,增强患儿信心。这些目标的实现离不开漏斗胸患儿围手术期健康教育以及广大医护人员增强加速康复理念,实践加速康复技术。

随着 ERAS 理念在小儿外科的不断强化和扩展,更多的医护人员加入其中,从而统一了围手术期和术后随访期漏斗胸的规范化管理,提升了漏斗胸临床治疗质量。

利益冲突 所有作者均声明不存在利益冲突

作者贡献声明 文献检索为胡梦珑,论文结果撰写为胡梦珑、戚继荣

参 考 文 献

- [1] Cramm SL, Luckhurst C, Galls A, et al. Thoracic epidural-based enhanced recovery after surgery (ERAS) pathway for Nuss repair of pectus excavatum shortened length of stay and decreased rescue intravenous opiate use[J]. *Pediatr Surg Int*, 2021, 37(9): 1191-1199. DOI: 10.1007/s00383-021-04934-x.
- [2] Nuss D, Obermeyer RJ, Kelly RE Jr. Pectus excavatum from a pediatric surgeon's perspective[J]. *Ann Cardiothorac Surg*, 2016, 5(5): 493-500. DOI: 10.21037/acs.2016.06.04.
- [3] 王会, 刘威, 苏芷惠, 等. 漏斗胸住院患儿营养状况筛查及影响因素分析[J]. *中华实用儿科临床杂志*, 2019, 34(18): 1415-1417. DOI: 10.3760/cma.j.issn.2095-428X.2019.18.014. Wang H, Liu W, Su ZH, et al. Screening and influencing factors analysis for nutritional status in hospitalized children with pectus excavatum[J]. *Chinese Journal of Applied Clinical Pediatrics*, 2019, 34(18): 1415-1417. DOI: 10.3760/cma.j.issn.2095-428X.2019.18.014.
- [4] Rove KO, Edney JC, Brockel MA. Enhanced recovery after surgery in children: Promising, evidence-based multidisciplinary care[J]. *Paediatr Anaesth*, 2018, 28(6): 482-492. DOI: 10.1111/pan.13380.
- [5] Shinnick JK, Short HL, Heiss KF, et al. Enhancing recovery in pediatric surgery: a review of the literature[J]. *J Surg Res*, 2016, 202(1): 165-176. DOI: 10.1016/j.jss.2015.12.051.
- [6] George JA, Koka R, Gan TJ, et al. Review of the enhanced recovery pathway for children: perioperative anesthetic considerations[J]. *Can J Anaesth*, 2018, 65(5): 569-577. DOI: 10.1007/s12630-017-1042-6.
- [7] 滑蕾, 高铮铮, 王小雪, 等. 加速术后康复(ERAS)策略在儿童漏斗胸手术中的临床应用[J]. *基础医学与临床*, 2018, 38(8): 1131-1134. DOI: 10.3969/j.issn.1001-6325.2018.08.015. Hua L, Gao ZZ, Wang XX, et al. Clinical application of enhanced recovery after surgery (ERAS) protocol in pediatric patients undergoing Nuss repair of pectus excavatum[J]. *Basic & Clinical Medicine*, 2018, 38(8): 1131-1134. DOI: 10.3969/j.issn.1001-6325.2018.08.015.
- [8] 杨宇蝶, 贾科. 胸外科手术围术期的加速康复外科研究进展[J]. *实用临床医药杂志*, 2021, 25(10): 119-123. DOI: 10.7619/jcmp.20210104. Yang YD, Jia K. Progress of enhanced recovery after surgery in perioperative period of thoracic surgery[J]. *Journal of Clinical Medicine in Practice*, 2021, 25(10): 119-123. DOI: 10.7619/jcmp.20210104.
- [9] 中国心胸血管麻醉学会日间手术麻醉分会, 中华医学会麻醉分会小儿麻醉学组. 儿童加速康复外科麻醉中国专家共识[J]. *中华医学杂志*, 2021, 101(31): 2425-2432. DOI: 10.3760/cma.j.cn112137-20201108-03034. Branch of Ambulatory Surgical Anesthesiology, Chinese Society of Cardiothoracic and Vascular Anesthesiology; Group of Pediatric Anesthesiology, Branch of Anesthesiology, Chinese Medical Association; Chinese Expert Consensus on Enhanced Recovery after Surgery during Anesthesia in Children[J]. *National Medical Journal of China*, 2021, 101(31): 2425-2432. DOI: 10.3760/cma.j.cn112137-20201108-03034.
- [10] Wang L, Guo T, Zhang H, et al. Three-dimensional printing flexible models: a novel technique for Nuss procedure planning of pectus excavatum repair[J]. *Ann Transl Med*, 2020, 8(4): 110. DOI: 10.21037/atm.2019.12.124.
- [11] 扶剑. 儿童及青少年漏斗胸患者心理研究进展[J]. *重庆医学*, 2019, 48(4): 665-667. DOI: 10.3969/j.issn.1671-8348.2019.04.027. Fu J. Advances in psychological research of children and adolescents with pectus excavatum[J]. *Chongqing Med*, 2019, 48(4): 131-133. DOI: 10.3969/j.issn.1671-8348.2019.04.027.
- [12] Li H, Jin X, Fan S, et al. Behavioural disorders in children with pectus excavatum in china: a retrospective cohort study with propensity score matching and risk prediction model[J]. *Eur J Cardiothorac Surg*, 2019, 56(3): 596-603. DOI: 10.1093/ejcts/ezz038.
- [13] Luo L, Xu B, Wang X, et al. Intervention of the nuss procedure on the mental health of pectus excavatum patients[J]. *Ann Thorac Cardiovasc Surg*, 2017, 23(4): 175-180. DOI: 10.5761/ates.0a.17-00014.
- [14] 谭小莉, 高乐, 何良平, 等. 认知行为干预对漏斗胸患儿 NUSS 术后心理状况及自我效能的影响[J]. *海南医学*, 2020, 31(6): 802-804. DOI: 10.3969/j.issn.1003-6350.2020.06.036. Tan XL, Gao L, He LP, et al. Effect of cognitive behavioral inter-

- vention on psychological status and self-efficacy of children with pectus excavatum after Nuss repair[J]. Hainan Medical Journal, 2020, 31(6): 802-804. DOI:10.3969/j.issn.1003-6350.2020.06.036.
- [15] Wildemeersch D, D'Hondt M, Hondt M, et al. Implementation of an enhanced recovery pathway for minimally invasive pectus surgery: a population-based cohort study evaluating short- and long-term outcomes using ehealth technology[J]. JMIR Perioper Med, 2018, 1(2): e10996. DOI:10.2196/10996.
- [16] Braegger C, Decsi T, Dias JA, et al. Practical approach to paediatric enteral nutrition; a comment by the ESPGHAN committee on nutrition[J]. J Pediatr Gastroenterol Nutr, 2010, 51(1): 110-122. DOI:10.1097/MPG.0b013e3181d336d2.
- [17] Li R, Qi J. Research progress of perioperative energy metabolism in infants with congenital heart disease[J]. Chinese Journal of Clinical Nutrition, 2015, 23(3): 189-192. DOI:10.3760/cma.j.issn.1674-635X.2015.03.013.
- [18] Wharton K, Chun Y, Hunsberger J, et al. Successful use of an enhanced recovery after surgery (ERAS) pathway to improve outcomes following the Nuss procedure for pectus excavatum[J]. J Pediatr Surg, 2020, 55(6): 1065-1071. DOI:10.1016/j.jpedsurg.2020.02.049.
- [19] 中华医学会小儿外科分会, 中华医学会麻醉学分会小儿麻醉学组. 加速康复外科指导下的儿童围手术期处理专家共识[J]. 中华小儿外科杂志, 2021, 42(12): 1057-1065. DOI:10.3760/cma.j.cn421158-20210822-00417. Branch of Pediatric Surgery, Chinese Medical Association; Group of Pediatric Anesthesiology, Branch of Anesthesiology, Chinese Medical Association; Expert Consensus on Perioperative Management of Children under the Guidance of Enhanced Recovery after Surgery[J]. Chin J Pediatr Surg, 2021, 42(12): 1057-1065. DOI:10.3760/cma.j.cn421158-20210822-00417.
- [20] Gelman D, Gelman A, Urbanaitė D, et al. Role of multimodal analgesia in the evolving enhanced recovery after surgery pathways[J]. Medicina (Kaunas), 2018, 54(2): E20. DOI:10.3390/medicina54020020.
- [21] Crumley S, Schraag S. The role of local anaesthetic techniques in ERAS protocols for thoracic surgery[J]. J Thorac Dis, 2018, 10(3): 1998-2004. DOI:10.21037/jtd.2018.02.48.
- [22] Piccioni F, Segat M, Falini S, et al. Enhanced recovery pathways in thoracic surgery from Italian VATS Group: perioperative analgesia protocols[J]. J Thorac Dis, 2018, 10(Suppl 4): S555-S563. DOI:10.21037/jtd.2017.12.86.
- [23] Semenkovich TR, Hudson JL, Subramanian M, et al. Enhanced recovery after surgery (eras) in thoracic surgery[J]. Semin Thorac Cardiovasc Surg, 2018, 30(3): 342-349. DOI:10.1053/j.semtcvs.2018.06.001.
- [24] Brockel MA, Polaner DM, Vemulakonda VM. Anesthesia in the pediatric patient[J]. Urol Clin North Am, 2018, 45(4): 551-560. DOI:10.1016/j.ucl.2018.06.003.
- [25] Thaker S, McKenna E, Rader C, et al. Pain management in pectus excavatum surgery: a comparison of subcutaneous catheters versus epidurals in a pediatric population[J]. J Laparoendosc Adv Surg Tech A, 2019, 29(2): 261-266. DOI:10.1089/lap.2018.0244.
- [26] Graves C, Idowu O, Lee S, et al. Intraoperative cryoanalgesia for managing pain after the Nuss procedure[J]. J Pediatr Surg, 2017, 52(6): 920-924. DOI:10.1016/j.jpedsurg.2017.03.006.
- [27] Lobe TE. Perioperative hypnosis reduces hospitalization in patients undergoing the Nuss procedure for pectus excavatum[J]. J Laparoendosc Adv Surg Tech A, 2006, 16(6): 639-642. DOI:10.1089/lap.2006.16.639.
- [28] 吴娜, 谢父民, 陈思远, 等. 微创 Nuss 手术治疗儿童漏斗胸的研究进展[J]. 临床小儿外科杂志, 2020, 19(2): 176-180. DOI:10.3969/j.issn.1671-6353.2020.02.017. Wu N, Xie YM, Chen SY, et al. Research advances of mini-invasive Nuss operation in the treatment of pectus excavatum in children[J]. J Clin Ped Sur, 2020, 19(2): 176-180. DOI:10.3969/j.issn.1671-6353.2020.02.017.
- [29] Castellani C, Schalamon J, Saxena AK, et al. Early complications of the Nuss procedure for pectus excavatum: a prospective study[J]. Pediatr Surg Int, 2008, 24(6): 659-666. DOI:10.1007/s00383-008-2106-z.
- [30] Pawlak K, Gąsiorowski Ł, Gabryel P, et al. Video-assisted-thoracoscopic surgery in left-to-right Nuss procedure for pectus excavatum for prevention of serious complications-technical aspects based on 1006 patients[J]. Wideochir Inne Tech Maloinwazyjne, 2018, 13(1): 95-101. DOI:10.5114/wiitm.2018.72683.
- [31] Clavien PA, Barkun J, de Oliveira ML, et al. The Clavien-Dindo classification of surgical complications: five-year experience[J]. Ann Surg, 2009, 250(2): 187-196. DOI:10.1097/SLA.0b013e3181b13ca2.
- [32] 唐林晨, 莫绪明. 漏斗胸 Nuss 手术研究进展[J]. 中华解剖与临床杂志, 2016, 21(4): 368-371. DOI:10.3760/cma.j.issn.2095-7041.2016.04.022. Tang LC, Mo XM. The research progress of Nuss procedure for pectus excavatum repair[J]. Chin J Anat Clin, 2016, 21(4): 368-371. DOI:10.3760/cma.j.issn.2095-7041.2016.04.022.
- [33] 商宏伟, 李强. 漏斗胸外科治疗进展[J]. 中国胸心血管外科临床杂志, 2021, 28(9): 1119-1124. DOI:10.7507/1007-4848.202006072. Shang HW, Li Q. Progress in surgical treatment of pectus excavatum[J]. Chinese Journal of Clinical Thoracic and Cardiovascular Surgery, 2021, 28(9): 1119-1124. DOI:10.7507/1007-4848.202006072.
- [34] Xu X, An J, Zhang Y, et al. Investigation of the quality of recovery of surgical patients based on the chinese version of the quality of recovery-15 survey, a cross-sectional study[J]. J Perianesth Nurs, 2022, 37(2): 199-203. DOI:10.1016/j.jopan.2021.04.002. (收稿日期: 2021-06-09)

本文引用格式: 胡梦琰, 戚继荣. 围手术期加速康复理念在漏斗胸中的应用进展[J]. 临床小儿外科杂志, 2022, 21(6): 582-585. DOI:10.3760/cma.j.cn101785-202002009-016.

Citing this article as: Hu ML, Qi JR. Research advances in enhanced recovery after surgery for pediatric pectus excavatum during perioperative period[J]. J Clin Ped Sur, 2022, 21(6): 582-585. DOI:10.3760/cma.j.cn101785-202002009-016.