

指南与共识

《儿童瘢痕预防与治疗临床实践指南(2025版)》解读

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[摘要] 儿童皮肤生理特性与生长发育需求决定了儿童瘢痕治疗有其特殊性。之前, 国内外并无针对儿童瘢痕预防和治疗的临床实践指南。中华医学会烧伤外科学分会于2025年发布的《儿童瘢痕预防与治疗临床实践指南(2025版)》, 以循证医学为基础, 围绕创面处理、药物治疗、物理治疗、手术治疗、康复干预、心理支持等儿童瘢痕预防与治疗中的10个核心临床问题, 形成20条推荐意见, 构建了涵盖儿童瘢痕“预防-治疗-康复”的一体化指导体系。该指南结合制定背景与自身特色, 在推荐意见的解读部分用较为详尽的文献证据, 强调了推荐意见形成的内在逻辑, 对目前临床尚存争议的治疗方法, 作出全面、客观的评价, 可为临床医师规范开展儿童瘢痕预防和治疗工作提供具有可操作性的指导和参考。该文结合儿童瘢痕预防和治疗领域的研究进展, 对该指南要点进行解析, 以帮助临床医师更好地理解和实施该指南。

[关键词] 儿童; 瘢痕; 治疗; 预防; 指南解读

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Interpretation of the Clinical Practice Guideline for the Prevention and Treatment of Scars in Children (2025 Edition)

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[Abstract] The physiological characteristics of children's skin and their growth and development needs determine the particularity of pediatric scar management. However, there were no clinical practice guidelines for the prevention and treatment of pediatric scars worldwide previously. *The Clinical Practice Guideline for the Prevention and Treatment of Scars in Children (2025 Edition)*, released by the Chinese Society of Burn Surgery of the Chinese Medical Association in 2025, is based on evidence-based medicine. Focusing on 10 key clinical issues in pediatric scar prevention and treatment, including wound management, pharmacological therapy, physical therapy, surgical treatment, rehabilitation intervention, and psychological support, the guideline formulates 20 recommendations and establishes an integrated guidance system covering the prevention-treatment-rehabilitation continuum for pediatric scars. Combined with its formulation background and features, the guideline provides detailed literature evidence in the interpretation section of the recommendations, emphasizes the inherent logic behind the development of these recommendations, and conducts a comprehensive and objective evaluation of currently controversial therapeutic methods in clinical practice. It can serve as a practical guide and reference for clinicians to standardize the prevention and treatment of pediatric scars. Based on the research progress in pediatric scar prevention and treatment, this article analyzes the key points of the guideline to facilitate better understanding and implementation.

[Key words] child; scar; therapy; prevention; guideline interpretation

瘢痕是皮肤损伤修复产生的病理性产物, 可导致疼痛、瘙痒、容貌损毁、关节功能障碍等生理损害, 是烧伤整形学科面临的挑战之一^[1]。儿童特殊的生理特点, 导致儿童瘢痕的防治尤为困难。例如: 儿童易遭受烧伤、创伤等意外伤害, 并形成瘢痕;

儿童皮肤屏障未发育成熟, 皮肤创面愈合过程中更易发生胶原比例失调、结构紊乱、瘢痕增生; 儿童处于快速生长发育阶段, 增生的瘢痕易导致容貌损毁、畸形发育等问题。此外, 儿童身心发育尚未成熟, 对瘢痕治疗的依从性差, 且生长发育过程还会

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持续带来新的整复需求。这些特点都导致儿童成为瘢痕防治的重点人群。之前，国内外尚无针对儿童瘢痕预防与治疗的指南与共识。为填补这一空白，中华医学会烧伤外科学分会组织烧伤外科、整复外科、循证医学等领域专家，全面梳理和总结现有文献报道、临床证据和诊疗经验，制订《儿童瘢痕预防与治疗临床实践指南（2025 版）》（下文简称指南），旨在为儿童瘢痕的预防、治疗及康复提供科学指导^[2]。本文结合儿童瘢痕预防和治疗的研究进展，对该指南要点进行解析，以期帮助临床医师更好地理解 and 实施该指南。

1 指南制定方法与适用人群

指南应用对象为 1~14 岁儿童群体，排除小于 1 岁、不适合采用常规瘢痕治疗措施的婴儿。指南以儿童瘢痕预防和治疗全流程管理为核心目标，形成“预防-治疗-康复”一体化指导体系；通过系统梳理 10 个关键临

床问题，并以 PICO（P：人群/患者；I：干预措施；C：对照/比较；O：结局指标）框架对临床问题进行解构；检索全球范围内的儿童瘢痕预防和治疗相关文献；参考 GRADE（Grading of Recommendations Assessment, Development, and Evaluation）系统证据分级及其升级因素对每条证据质量进行评级。经过 3 轮会议讨论、2 轮德尔菲法专家函询，最终形成 20 条推荐意见（表 1），内容涵盖儿童瘢痕防治（创面处理）、儿童瘢痕基础疗法（外用药物与压力治疗）、儿童瘢痕进阶干预（药物注射与光电技术）、儿童瘢痕综合管理（手术、康复与心理支持）及儿童瘢痕效果评估（评价量表）。每位专家根据证据质量、利弊平衡、价值观/偏好以及资源利用 4 个因素，从“强推荐”“中推荐”“弱推荐”或“不推荐”4 个选项中对每条指南意见推荐强度进行选择。最终意见的推荐等级综合了证据质量和专家组推荐强度，力争具有普适性和准确性。同时，指南重视争议问题，直面临床尚存争议的治疗策略，客观阐述研究现状，为未来临床研究指明方向。

表 1 指南推荐意见及要点解析

Tab 1 Recommendations and key points analysis of the guideline

Recommendation	Interpretation
Wound factors in scar prevention and treatment for children	Given the correlation between wound healing time and the incidence of hypertrophic scars, systematic wound management aimed at promoting wound healing should be prioritized as the primary method for scar prevention and treatment. Practice should be based on existing evidence, relevant expert consensus, and the use of available resources. Greater attention should be given to the treatment of wounds with a predicted healing time exceeding 20 d (strongly recommended) (evidence level: moderate)
Selection of topical anti-scar agents for children	Silicone-based agents are recommended after wound epithelialization for >12 h per day until scar maturation (high-level evidence). For established scars, the topical application of silicone gel is recommended to soften the scars and alleviate itching, pain, and redness (moderate-level evidence). For well-healed wounds, silicone gel sheets/tapes are prioritized for preventing scar hypertrophy. If the newly formed skin is thin and fragile, silicone gel may be used initially, with gradual transition to silicone gel sheets/tape based on wound condition (strongly recommended) (evidence level: moderate). Topical application of medications containing onion extract on the scar surface twice daily for at least 28 d is recommended to improve scar thickness, redness, itching, hyperpigmentation, and pain (moderately recommended) (evidence level: moderate)
Pressure therapy for pediatric scars	Pressure therapy is recommended to commence as soon as wound epithelialization is complete. Pressure should be maintained in the range of 2.00–5.33 kPa with a daily treatment duration of at least 23 h (strongly recommended) (evidence level: moderate) The advent of affordable 3D scanning and printing has been an important recent development allowing for tailor-made solutions. Transparent masks produced via 3D scanning and printing are recommended for pediatric facial scar prevention and treatment and can be combined with silicone to increase pressure in specific areas and protect the skin, reducing the impact on the growth and development of facial bones and teeth (moderately recommended) (evidence level: low). Combining pressure therapy with silicone-based medications or laser therapy for wounds that have achieved re-epithelialization is recommended (strongly recommended) (evidence level: moderate)
Medication injection treatment for pediatric scars	For small pediatric scars associated with significant itching and pain, intralesional injection therapy with glucocorticoid steroids is recommended. Treatment dosage should be individualized based on scar thickness, area, and severity. A single dose of triamcinolone acetonide ranges from 10 to 40 mg, with injection intervals of 1 to 4 weeks. Empirically, a course of 4–8 injections is recommended, and the total monthly dose should not exceed 40 mg; dosing per kilogram body weight may be more appropriate. Subsequent treatments should be adjusted according to the therapeutic response until the scar becomes flattened and softened or no further improvement is observed (moderately recommended) (evidence level: moderate)

Continued Tab

Recommendation	Interpretation
Laser therapy for pediatric scars	Laser therapy is recommended to be initiated at 1–2 weeks after traumatic wound healing, 2 weeks after burn healing, and 2–4 weeks after skin grafting (moderately recommended) (evidence level: low). The use of pulsed-dye laser (PDL), intense pulsed light (IPL), or fractional CO₂ laser for the prevention of scar hypertrophy is recommended (moderately recommended) (evidence level: low). For children with thickened scars accompanied by pain and itching, low-energy fractional CO₂ laser treatment is recommended (strongly recommended) (evidence level: high). For pediatric hypertrophic scars accompanied by pruritus, pain, or significant thickening, a treatment regimen combining a fractional CO₂ laser with topical drug delivery is recommended (evidence level: low). PDL combined with fractional CO₂ lasers or compression therapy is also recommended to reduce scar erythema, improve thickness, and modulate biomechanical properties (moderately recommended) (evidence level: high). An ablative fractional laser is recommended as the primary option for treating mild scar contracture in children. The appropriate laser energy should be selected based on the thickness of the scar. PDL can also be used in combination (moderately recommended) (evidence level: moderate). Combining laser therapy with functional exercise and rehabilitation for pediatric scar contractures is recommended (weakly recommended) (evidence level: very low). The use of local anesthetics or cold sprays during laser therapy for pain management is recommended (moderately recommended) (evidence level: moderate)
Surgical treatment of pediatric scars	When scars limit functional activity, lead to recurrent ulceration, or risk affecting growth or causing cosmetic damage, surgical intervention is recommended if non-surgical therapies are ineffective (strongly recommended) (evidence level: low)
Rehabilitation training in the prevention and treatment of pediatric scars	It is recommended to adopt a rehabilitation philosophy of “early intervention, comprehensive management, and continuous follow-up” by implementing an integrated scar rehabilitation program that incorporates kinesiotherapy, scar massage, and play therapy as early as possible (moderately recommended) (evidence level: low). It is recommended that rehabilitation therapy, including exercise and scar massage, be conducted under the guidance of a therapist in a healthcare facility or at home. When scar massage is performed, ample pressure should be applied to improve tissue elasticity and pliability (moderately recommended) (evidence level: very low)
Psychotherapy in the prevention and treatment of pediatric scars	It is recommended that medical staff closely monitor the psychological state of children using objective measurement tools where possible (moderately recommended) (evidence level: very low)
Family support in the prevention and treatment of pediatric scars	It is recommended that healthcare providers and patients use digital health platforms, such as online hospital systems and WeChat, to establish a regular communication mechanism for children undergoing scar rehabilitation at home to provide timely and tailored guidance (moderately recommended) (evidence level: moderate)
Assessment of the treatment outcomes for pediatric scars	It is recommended that the VSS and POSAS be used to evaluate pediatric scar treatment outcomes, supplemented by objective measurement tools (moderately recommended) (evidence level: very low)

2 指南推荐意见深度解析

2.1 儿童瘢痕预防与治疗的创面因素

围绕此问题形成1条强推荐意见。创面规范化处理是儿童瘢痕预防的第一道防线，核心在于早愈合、防感染。指南强烈推荐将规范化的创面处理作为儿童瘢痕预防与治疗的首要措施。《儿童深Ⅱ度烧伤创面处理专家共识（2023版）》^[3]全面梳理了儿童深Ⅱ度烧伤创面处理相关问题，明确提出一系列创面处理原则、综合抗瘢痕治疗、坚持定期随访等意见。本指南延续该共识内容，进一步聚焦儿童瘢痕防治时的创面处理原则。建议对于儿童偏浅的深Ⅱ度烧伤创面，应尽早清除创面坏死组织，使用生物敷料或功能性创面敷料覆盖创面，以加速创面愈合和降低瘢痕增生风险；对于深Ⅱ度或Ⅲ度创面，当预估愈合时间超过3或4周，或功能部位创面可能因瘢痕影响功能，应考

虑尽早行皮片移植手术以完成创面覆盖^[4-5]；对创面进行缝合处理时，应考虑采用减张缝合等方法减少张力影响，并在创面愈合后采用适当的外减张方法治疗3~6个月。该推荐意见首次明确将瘢痕治疗时间关口前移至创面形成之初而非创面愈合后，强调良好的创面处理在瘢痕防治中的重要性。

2.2 儿童外用抗瘢痕药物的选择

围绕该问题共形成2条推荐意见，其中1条为强推荐，1条为中推荐。外用药物操作简便、无创，是儿童瘢痕防治的常用方法。应以安全优先、精准选择为药物使用原则。硅酮凝胶、硅凝胶片和硅酮胶带等硅酮制剂，具有方便、无创、不良反应少等特点，相关专家共识^[3,6]均强烈推荐在儿童瘢痕防治中使用该类药物。除推荐儿童创面上皮化完成后使用，每日使用时长超过12 h，直至瘢痕成熟外，指南还根据专家

临床经验,提出基于创面愈合质量采用不同硅酮类药物剂型。对于新生皮肤菲薄、创面愈合质量较差的创面,建议先选用硅酮凝胶,以避免长时间应用硅酮贴片导致皮肤浸渍、破溃、湿疹等情况的发生,后根据创面情况再逐渐过渡至硅凝胶片或胶带。这种分阶段使用不同剂型硅酮制品的治疗方法,可以提高患者的治疗依从性。含酯化维生素C的硅酮凝胶能更好地改善色素沉着和红斑,指南在证据介绍中对其进行了推荐^[7]。此外,指南推荐在儿童瘢痕表面外用含洋葱提取物药物,该药物可作为硅酮制剂的替代或补充,长期应用于儿童瘢痕治疗。

2.3 儿童瘢痕的压力治疗

围绕此问题共形成3条推荐意见,其中2条强推荐,1条中推荐。对压力治疗可能影响儿童肢体骨骼、肌肉发育的顾虑,是影响治疗依从性,直接影响治疗效果的重要因素。该指南指出,目前尚无临床证据显示压力治疗对儿童肢体的骨骼、肌肉发育会造成长期影响。但指南也较为谨慎地提出,应在专业指导下定制和优化压力治疗方案,避免束缚过紧导致血液循环障碍或影响儿童身体生长发育^[8-10]。对于压力范围,建议维持在2.00~5.33 kPa,并提倡遵循“早、久、紧”的原则;其中,2.00 kPa是起效阈值。指南针对传统织物面罩难以贴合面部凹凸轮廓、压力不均、患儿耐受差的难题,提出需对面部压力治疗进行精准化升级。推荐在儿童面部瘢痕预防与治疗中使用扫描打印的三维透明压力面罩,联合硅胶增加特殊位置压力及保护皮肤,以更好地贴合面部,在充分施压的同时又可减少对面部骨骼及牙齿生长发育的影响^[11-13]。

对于已经完成上皮化的儿童创面,指南强推荐采用压力治疗联合硅酮类药物或光电治疗的综合干预方案,但应注意该综合干预方案的治疗时机。非剥脱性光电治疗后1~3 d内可开始压力治疗,剥脱性光电治疗则应适当延长至治疗后3~7 d内开始。硅酮药物剂型也应根据部位特点选择,如凹凸不平或活动部位,选用硅酮凝胶,平坦部位则选择硅酮贴,并可适当剪裁以更好地贴合瘢痕。

2.4 儿童瘢痕的瘢痕内注射治疗

围绕此问题共形成1条中推荐意见。瘢痕内注射疗法是瘢痕预防与治疗的常用手段,但儿童瘢痕采用注射治疗,应特别考虑儿童生理机能及药物代谢能力的特殊性。指南强调在选择儿童瘢痕内注射药物时,

应将药物的不良反应作为重要考量因素,遵循个体化、精准化原则,制定适宜的用药方案。糖皮质激素瘢痕内注射治疗一般仅用于瘢痕范围较小、瘢痕控制不良或痛痒症状明显的患儿。治疗剂量应根据瘢痕厚度、面积和严重程度进行个体化选择。

5-氟尿嘧啶(5-fluorouracil, 5-FU)被纳入“儿童瘢痕预防与治疗尚存争议问题”部分,可见临床对其不良反应的担忧明显甚于糖皮质激素。目前,5-FU注射治疗非瘢痕一线治疗方式,需严格控制适应证和剂量,仅建议在复发性、病情进展极为迅猛,且对糖皮质激素注射治疗无效的增生性瘢痕和瘢痕疙瘩患者中谨慎实施。

2.5 光电技术在儿童瘢痕预防与治疗中的应用

光电技术近年来在儿童瘢痕防治中应用日渐广泛,其疗效也被多项临床研究证实。围绕此问题共形成7条推荐意见,其中1条为强推荐,5条为中推荐,1条为弱推荐。儿童处于快速生长发育阶段,且皮肤成纤维细胞活性强,皮肤附属器官密度高,导致瘢痕形成往往较成年患者更加严重^[14]。在光电治疗儿童瘢痕时,应该根据治疗目标(如红斑、增厚、色素异常、挛缩)合理选择光电类型,避免过度泛化使用光电治疗。指南中对不同类型创面的光电治疗时机提出了明确的推荐意见,在儿童非烧伤创面、烧伤创面和皮片移植创面,光电治疗的启动时间分别为愈合后1~2周、愈合后2周和皮片移植后2~4周。对于治疗方式,则建议优先采用脉冲染料激光(pulsed dye laser, PDL)、强脉冲光或联合点阵二氧化碳激光预防儿童瘢痕增生,以有效封闭瘢痕内微小血管,抑制血管形成,使局部微循环正常化^[15-16]。在创面完全上皮化、无明显炎症的瘢痕早期阶段,可使用点阵二氧化碳激光进行治疗;但应使用比成人更低的激光能量,具体参数还需考虑患儿年龄及依从性等因素。

对于已增厚且伴有疼痛、瘙痒症状的儿童瘢痕,指南强推荐优先选择低能量点阵二氧化碳激光进行治疗。同时,推荐采用点阵二氧化碳激光联合外用药物混悬液的治疗方案,或使用PDL联合点阵二氧化碳激光,也可联合压力治疗,以减轻瘢痕充血,改善其厚度及生物力学特性^[17-18]。

指南推荐将剥脱性点阵激光作为改善儿童轻度瘢痕挛缩的首选方案,并应依据瘢痕厚度选择适宜的激光能量。PDL与点阵二氧化碳激光可协同作用,对儿

童瘢痕增生与挛缩产生显著、持久的改善作用^[19-21]。同时,指南认为瘢痕挛缩的治疗是一个长期过程,弱推荐将光电治疗联合功能锻炼,用于儿童瘢痕挛缩的治疗,以预防瘢痕挛缩的复发。

儿童瘢痕光电治疗时的镇痛问题,也是临床关注的焦点。基于儿童创面愈合后初期的皮肤屏障功能尚未完全建立,局部麻醉药物吸收风险增大的考虑,指南推荐在激光治疗过程中利用局部镇痛药或冷风机实施镇痛,以减少局部麻醉药物过量导致的不良反应,增加儿童瘢痕光电治疗的安全性。

2.6 儿童瘢痕的手术治疗

对儿童生长发育的影响,尤其是对脑发育的影响,一直是治疗方案选择时的关键考量因素。对于手术治疗的选择,指南采取了较为谨慎的态度,仅推荐对存在重度功能受限、溃疡、影响生长发育和容貌损毁等问题的儿童瘢痕选择手术治疗。手术治疗应以瘢痕松解术为核心,以“功能恢复优先于外观改善”为原则,结合皮片移植、皮瓣移植等缺损重建方式的个性化设计方案,同时应尽可能避免医源性瘢痕的产生^[22-23]。唯一的强推荐意见既符合目前临床治疗的实际,也体现了指南制定者审慎、科学的态度。

2.7 儿童瘢痕预防与康复治疗、心理治疗和家庭支持

围绕儿童瘢痕预防与康复治疗、心理治疗和家庭支持这3个临床问题,形成4条中推荐意见。

当前,尚无研究明确界定不同康复治疗方法的最佳启动时机,以及不同康复手段的理想组合方式。指南推荐贯彻“早期介入,综合干预,全程关注”的康复理念,采用运动疗法、瘢痕按摩、结合游戏疗法的方式尽早开展儿童瘢痕综合康复治疗。进行瘢痕按摩时,需对瘢痕施加充足压力以实现深层循环的作用。此外,对于康复治疗的场所,指南推荐在康复治疗师的指导下,既可在医疗机构,也可居家开展运动锻炼、瘢痕按摩等康复治疗,而非严格要求在医疗机构中实施^[24]。加强对瘢痕患儿家长的居家康复培训,是保证治疗效果的前提。

指南推荐医护人员密切关注瘢痕患儿心理状态,及时调节患儿情绪,帮助其树立信心,通过心理干预维护患儿心理健康。可通过优质护理、一对一心理教育、动画观看、联合认知行为干预等多种方式,帮助患儿缓解负面情绪,提升生活质量。

指南推荐医患双方利用互联网医院、微信等网络平台,为居家康复治疗的瘢痕患儿构建定期医患沟通渠道,及时给予针对性指导。还可为出院后瘢痕形成高风险患儿建立定期随访档案与配套机制,并借助上述手段为无法持续在院康复治疗的瘢痕患儿提供瘢痕康复的延续性治疗指导。

2.8 儿童瘢痕的治疗效果评估

既往临床瘢痕评估通常使用温哥华瘢痕量表(Vancouver Scar Scale, VSS),从色泽、血管分布、厚度、柔软度4个维度进行评估。除了VSS外,指南还建议使用患者与观察者瘢痕评估量表(Patient And Observer Scar Assessment Scale, POSAS),从疼痛程度、瘙痒程度、颜色、厚度、柔软度和自我观感6个维度,结合患儿主观感受和观察者(患儿家属)测量结果对儿童瘢痕治疗效果进行动态评价。POSAS综合了观察者的评价结果,可能更符合儿童这一特殊人群的瘢痕治疗效果评价需求。此外,联合多种测量工具(如超声、皮肤镜、激光多普勒血流仪)对儿童瘢痕的面积、厚度、色泽、血管分布和柔软度等进行客观化评价,提高评估准确性,也是未来瘢痕防治领域需进一步规范的内容。

3 儿童瘢痕预防与治疗的争议问题

临床实践中,仍存在诸多具有争议性的儿童瘢痕预防与治疗策略。尤其是出于儿童独特的生长发育特点考虑,很多治疗措施虽然临床效果显著,但因缺乏对其安全性的大样本长期跟踪研究,无法形成明确的推荐意见。瘢痕防治的复杂性和临床医师个人经验的差异,也使部分儿童瘢痕防治策略未得到广泛认可。指南将部分措施归入“尚存争议”的问题,既提出了未来值得研究的临床问题,也提醒了临床医师规避潜在医疗风险。

3.1 生长因子

生长因子(如表皮生长因子和成纤维细胞生长因子)在促进儿童创面愈合和减少瘢痕形成方面具有一定作用。但对于生长因子的安全性,尤其是长期使用安全性的相关研究还较少。

3.2 饮食管理

合理的饮食可通过调节炎症反应、促进组织修

复、抑制纤维化等多种机制,降低儿童瘢痕增生的风险,而辛辣刺激、高脂高糖饮食则被认为会加重瘢痕增生^[25]。指南仅建议将饮食管理作为瘢痕预防的重要环节,在避免致炎食物的基础上强化关键营养素的补充,无法形成儿童瘢痕预防与治疗的饮食标准共识。

3.3 外用糖皮质激素

无法耐受瘢痕内注射的患儿,可外用糖皮质激素软膏,以缓解瘙痒、疼痛等症状。但需考虑长期使用对生长发育的影响,12岁以下儿童需慎用强效制剂。目前,外用糖皮质激素用于儿童瘢痕预防与治疗,仍存在较多争议。如日本将外用糖皮质激素软膏和霜剂作为儿童瘢痕防治的一线治疗方式,但指南编写组部分专家建议在儿童瘢痕预防与治疗时应谨慎考虑外用糖皮质激素。

3.4 中医治疗

中医有其独特的瘢痕预防与治疗理念,治疗方法主要包括口服药物、外用药物及针灸。部分临床研究报告中医治疗对儿童瘢痕有一定改善效果,但这些研究缺乏循证医学证据支撑,或药物有效成分不明确,且治疗可能存在潜在不良反应。因此,指南对中医治疗在儿童瘢痕预防与治疗中的应用,未形成推荐意见。

3.5 A型肉毒毒素注射治疗

A型肉毒毒素属于强效神经毒素,可减轻瘢痕形成过程中的张力,从而减轻瘢痕增生程度。然而,多次注射治疗时需注意A型肉毒毒素导致的中毒现象,如可能出现上睑下垂、头痛、远离治疗区域部位肌无力等不良反应。因此,指南认为需谨慎采用注射A型肉毒毒素的治疗方式。

3.6 5-FU注射治疗

5-FU是可抑制核酸合成和细胞增殖的抗肿瘤化学治疗药物。目前尚缺乏大规模、高质量的临床研究证实5-FU在儿童瘢痕治疗中的安全性与有效性,也未形成统一的使用方法。考虑到5-FU对儿童生长发育的潜在不良影响,指南建议仅针对复发性、病情进展极为迅猛,且对糖皮质激素注射治疗无效的增生性瘢痕和瘢痕疙瘩,谨慎考虑采用该方法。

3.7 放射治疗

因放射治疗可能对儿童未发育成熟的器官造成永

久性损伤,导致专家们对放射治疗在儿童瘢痕治疗中的应用存在较大分歧。部分专家认为,儿童瘢痕的放射治疗并非绝对禁忌,可基于利弊权衡,综合考虑放射治疗技术、剂量分割及治疗部位等因素的合理性,谨慎选择。而部分专家则持明确反对意见,认为烧伤、创伤后多形成增生性瘢痕而非瘢痕疙瘩,放射治疗的必要性较低,且目前缺乏放射治疗对儿童生长发育影响的长期跟踪研究。

3.8 瘢痕色素异常治疗

临床常用的治疗药物虽可一定程度改善色素异常状况,但其在儿童中应用的安全性尚未得到充分验证。此外,长期用药存在依从性的问题,且改善效果不明显。与之相比,光电治疗凭借患者易于接受、安全性高、疗效显著等特点,成为儿童瘢痕色素异常治疗的优选方案。然而,有关光电治疗在儿童瘢痕色素异常治疗中的应用,临床研究数量较少,尚无被广泛接受的标准化光电治疗方法。

4 总结

《儿童瘢痕预防与治疗临床实践指南(2025版)》是首部针对1~14岁儿童进行瘢痕预防和治疗临床实践指南,该指南的核心价值在于立足儿童特殊性,构建了科学、规范的全流程临床干预框架。本文通过对指南进行解读,指导临床医师理解指南的内在逻辑。但指南并未提出固定治疗路径,而是为临床决策提供参考框架。因此,临床医师在应用指南时,仍需结合患儿个体情况进行动态评估和调整,平衡治疗效果与安全性,同时关注患儿康复与心理支持。未来,随着循证医学证据的积累,儿童瘢痕防治将向精准化、个体化方向持续发展,进一步延续全流程干预理念,加强烧伤外科、儿科、康复科、心理科等多学科联动,构建全周期、多维度的儿童瘢痕防治体系,为瘢痕患儿身心健康提供更有力的保障。

利益冲突声明/Conflict of Interests

所有作者声明不存在利益冲突。
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作者贡献/Authors' Contributions

陈云生、原博负责文献检索和论文写作;邓丹、刘琰负责论文修改。所有作者均阅读并同意了最终稿件的提交。

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