

## **PICO SEARCH ASSIGNMENT WORKSHEET**

### **Brief description of patient problem/setting (summarize the case very briefly)**

Patient is a 17 y/o male with no significant PMHx presents to ED for finger lacerations x 1 day. He reports last night he lifted his right hand and hit a light bulb which shattered on his hand. He endured multiple cuts on his fingers. On observation, two lacerations were noted – one on the tip of the 3<sup>rd</sup> digit and another over the dorsal metacarpophalangeal joint of 2<sup>nd</sup> digit. Denies radiation of pain. Xray of his hand were unremarkable. No evidence of fracture, dislocation or foreign bodies noted on imaging. Denies numbness, tingling, fever, or difficulty moving his fingers. The patient states he does not want stiches unless “absolutely necessary”. He requested glue instead. Two sutures were placed for the dorsal laceration, and Dermabond was applied on the distal phalanx of the 3<sup>rd</sup> digit.

**Search question:** Clearly state the question (including outcomes or criteria to be tracked)

In children with traumatic skin lacerations, does tissue adhesive compared to sutures result in similar cosmetic outcomes, infection rates, and wound healing times?

**Question type:** What kind of question is this?

Prevalence

Screening

Diagnosis

Prognosis

Treatment

Harm

**Assuming that the highest level of evidence to answer your question will be meta-analysis or systematic review, what other types of study might you include if these are not available (or if there is a much more current study of another type)? Please explain your choices.**

If meta-analyses and systematic reviews are not available, I would include randomized controlled trials (RCTs), as they minimize bias and confounding variables through randomization and provide strong comparisons between tissue adhesives and sutures for outcomes such as cosmetic results, infection rates, and healing time. If RCTs are unavailable or outdated, prospective cohort studies may be useful, as they follow patients over time and provide clinically relevant, real-world data on intervention outcomes and complications in larger patient populations. Case-control studies may be considered as a last option if RCTs and prospective cohort studies are unavailable. Although they have a higher susceptibility to bias, they can still offer more recent data and valuable insights. Overall, systematic reviews, meta-analyses, and RCTs are preferred, as they represent the highest levels of evidence.

### **PICO search terms:**

<b>P</b>	<b>I</b>	<b>C</b>	<b>O</b>
Skin lacerations	Tissue adhesives	Sutures	Healing time
Traumatic lacerations	Dermabond	Stiches	Cosmetic outcome
Pediatrics	Adhesives glue	Nylon suture	Infection rate
Adolescents	Cyanoacrylate		Would complications
			Scarring

			Efficacy
			Treatment outcome

**Search tools and strategy used:**

Please indicate what databases/tools you used, provide a list of the terms you searched together in each tool, and how many articles were returned using those terms and filters. Explain how you narrowed your choices to the few selected articles. For example, if your search returned 25 articles among the several databases used, what was the process used to determine which four articles to use?

Database	Search terms used	# or results	Filters applied
PubMed	("skin laceration" OR "pediatric") AND ("dermabond" OR "adhesives") AND ("suture" OR "stiches") AND ("outcome) OR (cosmetic")	10	Last 10 years, full text, meta-analysis, randomized controlled trial, systematic review, English, Humans, Children: birth - 18, MEDLINE
EBSCO	("children" OR "skin laceration") AND ("adhesive" OR "dermabond") AND ("stiches" OR "sutures") AND ("outcomes" OR "complications" OR "cosmetic")	25	Past 10 years, English, All Child: 0-18 years, Database: Medline, CINAHL, Academic Search, Academic Journal, etc.
Google scholar	("children" OR "skin laceration" OR "trauma") AND ("adhesive" OR "dermabond") AND ("stiches" OR "sutures") AND ("outcomes" OR "complications" OR "cosmetic")	3,110	Time range: 2021-2026, Review articles, sort by relevance

For this PICO question, I used the following databases: PubMed, EBSCO, and Google Scholar. In the PubMed database, I applied the search terms and filters listed above, which resulted in 10 articles. I reviewed each title to gain a general understanding of each study's focus. I then read

the abstracts of articles that were relevant to my PICO question, which compared tissue adhesives with sutures for the management of lacerations. In the end, I selected one article from PubMed that was a systematic review and meta-analysis comparing treatment outcomes among tissue adhesives, adhesive strips (tape), and sutures in surgical wounds and lacerations in pediatric patients.

In the EBSCO database, using the search terms and filters listed above resulted in 25 articles. Similar to my approach in PubMed, I first reviewed the titles to determine which studies were relevant to my PICO question. I specifically focused on studies involving traumatic skin injuries or lacerations, excluding those related to only surgical wounds. This narrowed my results to 5 relevant articles. From there, I read each articles' abstract and selected 2 articles: a randomized controlled trial and prospective cohort study that compared the interventions of interest in my PICO.

Similar to my approach with EBSCO, I focused on studies involving traumatic skin lacerations rather than only surgical wounds when searching in Google Scholar. However, the initial search yielded 3,110 results, even after applying filters such as "sort by relevance" and limiting publication dates to the past five years. Ultimately, I did not select any articles from this database, as many were narrative reviews or focused on surgical wounds rather than traumatic lacerations. These studies did not represent the highest level of evidence or directly address the intervention of interest in my PICO.

**Results found:**

Identify at least 3 articles (or other appropriate reputable sources) that answer your specific question with the highest available level of evidence (you will probably need to look at more than 3 articles to get the 3 most focused and highest-level articles to address your question). Please make sure that they are Medline indexed.

**Article 1**

**Citation:**

Tandon, S., Smale, M., Pacilli, M., & Nataraja, R. M. (2021). *Tissue adhesive and adhesive tape for pediatric wound closure: A systematic review and meta-analysis*. *Journal of Pediatric Surgery*, 56(6), 1020–1029. <https://doi.org/10.1016/j.jpedsurg.2020.07.037>

**Type of article:** Systematic review and meta-analysis

**Abstract:**

## A B S T R A C T

**Background:** Tissue adhesive (TiA), adhesive tape (AdT), and sutures can be used to close surgical wounds and lacerations in children. However, it is unclear which technique produces the best results.

**Methods:** In this prospectively registered study, the PubMed, Ovid MEDLINE, Cochrane Library, Centre for Reviews and Dissemination Database, and ScienceDirect databases were searched. English language studies published between January 1980 and August 2017 evaluating TiA and/or AdT for primary skin closure of surgical wounds or lacerations in patients aged  $\leq 18$  years were included. Study endpoints included clinician-rated wound cosmesis and incidence of wound complications.

**Results:** Thirty-one studies were included in the systematic review and 16 studies in the meta-analysis. Amongst heterogeneous studies, AdT yielded marginally better cosmetic outcomes than TiA ( $p = 0.04$ ). There was no difference in cosmesis between sutured wounds and those closed with TiA ( $p = 0.2$ ). No difference in overall risk of wound infection or dehiscence was identified when comparing TiA with AdT ( $p = 0.3$ ), and TiA with sutures ( $p = 0.9$  and  $0.3$  respectively).

**Conclusions:** TiA, AdT, and sutures can all be used for wound closure with equivalent risk of wound infection and dehiscence. AdT appears to convey better cosmesis. Further adequately powered studies directly comparing techniques are required.

### Key findings:

- No significant difference between tissue adhesives and sutures in terms of cosmetic outcomes. Adhesive tape showed slightly better cosmetic outcomes than tissue adhesive.
- No significant differences between tissue adhesive and sutures in infection rates. Infection rates were low across all methods of laceration repair. Tissue adhesive (~1%). Adhesive tape (~2.1%). Sutures (~1.8%)
- Wound dehiscence rate across all methods were (~0.5 – 1%)

**Why I chose this article:** I chose this article because it directly addresses my PICO question by comparing tissue adhesives and sutures in pediatric wound closure while evaluating outcomes such as cosmetic appearance, infection rates and wound healing complications. The study is a systematic review and meta-analysis, representing the highest level of evidence. Even though the study did not compare healing time, it did include outcomes such as wound dehiscence and overall complication rates, which provides a more comprehensive understanding of wound healing beyond just cosmetic results. Thus, this can aid in better clinical decision making when choosing between the two interventions for a laceration repair. Overall, this study provides strong, high level and evidence-based data that supports tissue adhesives as a possible safe and effective alternative to suture in pediatric patients.

### Article 2

#### Citation:

Barton, M. S., Saint Georges Chaumet, M., Hayes, J., Hennessy, C., Lindsell, C., Wormer, B. A., Kassis, S. A., Ciener, D., & Hanson, H. (2024). *A randomized controlled comparison of guardian-perceived cosmetic outcome of simple lacerations repaired with either Dermabond™, Steri-Strips™, or absorbable sutures*. *Pediatric Emergency Care*, 40(10), 700–704.  
<https://doi.org/10.1097/PEC.0000000000003244>

**Type of article:** Randomized controlled trial

**Abstract:**

**Abstract**

**Objectives**—The aim of this study was to compare the guardian-perceived three-month cosmetic outcome for pediatric lacerations repaired with absorbable sutures, Dermabond™, or Steri-Strips™. Secondly, pain and satisfaction with the procedure from both guardian and provider perspectives were compared.

**Methods**—In this randomized controlled trial, we enrolled a convenience sample of children aged 0 to <18 years who presented with simple linear lacerations (≤5 cm in length, ≤0.5 cm in width, and less than 12 hours old) to a pediatric Emergency Department. Children were

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Barton et al.

Page 2

randomized to receive laceration repair with absorbable sutures, Dermabond™, or Steri-Strips™. Topical L.E.T. solution (lidocaine, epinephrine, tetracaine) was applied to wounds which were then closed by the primary team. Guardians and providers completed questionnaires regarding perceived pain and satisfaction with the procedure. Guardians were contacted 3 months after the repair and asked to email a picture of the scar with their perception of cosmesis rated on a visual analogue scale from 0–100.

**Results**—Fifty-five patients were enrolled, of whom 30 completed three-month follow-up (12 suture, 7 Dermabond™, 11 Steri-strips™). There was no statistical evidence of an association between scar appearance and closure method based on medians and interquartile ranges for cosmetic ratings of scar: suture median 70.5 [IQR 59.8–76.8], Dermabond™ median 85 [IQR 73–90], Steri-strips™ median 67 [IQR 55–78], (p=0.254). Guardian satisfaction with length of stay, guardian and physician satisfaction with the procedure, and guardian and physician-perceived pain also showed no difference.

**Conclusions**—No differences were observed in guardian-perceived cosmesis of simple lacerations repaired with sutures, Dermabond™, or Steri-Strips™ when evaluated three months after intervention. Additionally, there were no differences in guardian or physician-perceived pain or satisfaction with the closure methods. The results of this study suggest that all three closure methods appear to be clinically equivalent, which is largely consistent with other evidence. Further study should be expanded to a larger demographic.

**Key findings:**

- No statistically significant difference between all methods of closing
- Adhesive glue (dermabond) had the lowest pain score (16.5) compared to sutures (26.7) and adhesive strips (23.9)
- Participants satisfaction among all methods of closing were similar. Dermabond (99.5%), sutures (99.5%), steri-strips (99%)
- No reported difference in treatment complications between groups, suggesting similar healing outcome.

**Why I chose this article:** I chose this article because this study is a randomized controlled trial, which represents a high level of evidence because it minimizes bias and allows for a direct comparison between different wound closure methods. Additionally, the study specifically focuses on simple traumatic lacerations in pediatric patients, making it highly relevant to my clinical question and patient. The findings demonstrated no statistically significant difference in

cosmetic outcomes between tissue adhesive, sutures, and adhesive strips, supporting the idea that tissue adhesives provide comparable results. Furthermore, there were no differences in perceived pain or satisfaction, suggesting that tissue adhesives may offer a less invasive and equally effective alternative to sutures. Although the study did not directly measure wound healing time, the comparable cosmetic outcomes and lack of complications suggest similar healing processes.

### **Article 3**

#### **Citation:**

Fontana, S., Schiestl, C. M., Landolt, M. A., Staubli, G., von Salis, S., Neuhaus, K., Mohr, C., & Elrod, J. (2021). *A prospective controlled study on long-term outcomes of facial lacerations in children*. *Frontiers in Pediatrics*, 8, 616151. <https://doi.org/10.3389/fped.2020.616151>

**Type of article:** Prospective controlled cohort study

#### **Abstract:**

**Background:** Although skin adhesives have been used for decades to treat skin lacerations, uncertainty remains about long-term results, and complications.

**Methods:** In this prospective, controlled, single-blinded, observational cohort study, outcomes were assessed by five plastic surgeons with standardized photographs at 6–12 months using a modified Patient and Observer Scar Assessment Scale (POSAS) and Vancouver Scar Scale (VSS); additionally, the POSAS was performed by the patients/caregivers and the physician; pain, requirement of anesthesia, treatment time, costs, complications, and quality of life (QoL) were assessed.

**Results:** A total of 367 patients were enrolled; 230 were included in the main analysis; 96 wounds were closed using tissue adhesives (group 1); 134 were sutured (group 2). Assessment by the independent observers revealed an improved mean modified overall POSAS score in group 1 in comparison with group 2 [2.1, 95% CI [1.97–2.25] vs. 2.5, 95% CI [2.39–2.63];  $p < 0.001$ ,  $d = 0.58$ ] and mean VSS score [1.2, 95% CI [0.981–1.34] vs. 1.6, 95% CI [1.49–1.79],  $p < 0.001$ ,  $d = 0.53$ ]. At the early follow-up, dehiscence rate was 12.5% in group 1 and 3.7% in group 2 ( $p < 0.001$ ); later on, one dehiscence remained per group. Mild impairment of QoL was found at the early follow-up in both groups, with no impairment remaining later on. Duration of treatment and treatment costs were lower in group 1.

**Conclusion:** Both modalities of wound closure yield favorable esthetic results, and complications are rare. Adhesives are more cost-effective, and its application is less time-consuming; therefore, tissue adhesives offer considerable advantages when used appropriately.

#### **Key findings:**

- Tissue adhesives demonstrated slightly better cosmetic outcomes than sutures. The Patient and Observer Scar Assessment Scale (POSAS) and Vancouver Scar Scale (VSS)

were used to evaluate scar appearance. The mean POSAS scores were 2.1 for tissue adhesive and 2.5 for sutures, while VSS scores were 1.2 and 1.6, respectively.

- Infection rates were low and not statistically significant, with 1% for tissue adhesive and 2% for sutures.
- Wound dehiscence rates were higher in the tissue adhesive group (12.5%) compared to sutures (3.7%). However, overall complication rates were 14% for tissue adhesive and 7% for sutures, with no statistically significant difference.
- Pain scores were similar between groups, with a mean score of 1.7 in both groups
- Sedation requirements were significantly lower in the tissue adhesive group with approximately 3% requiring sedation compared to ~40% in the suture group
- Quality of life showed mild impairment initially but no long-term impairment following treatment
- Treatment time was significantly shorter with tissue adhesive (6.3 minutes) compared to sutures (11.6 minutes)
- Cost analysis showed tissue adhesive to be more cost effective (\$244 vs %367 for sutures)

**Why I chose this article:** This study is a prospective controlled cohort study, allowing for real-time data collection and comparison between interventions, with long-term follow-up at 6–12 months to assess cosmetic outcomes and healing. The results showed that tissue adhesives produced similar, and in some cases slightly better, cosmetic outcomes compared to sutures, with no significant difference in infection rates. Although there was a higher early dehiscence rate with tissue adhesives, these complications were minor and resolved without long-term consequences. Tissue adhesives also required less procedural sedation, were faster to apply, and were more cost-effective. Although this study focused on facial lacerations and my patient had a hand laceration, it still provides useful insight into the effectiveness of tissue adhesives in low-tension areas. Overall, this study supports tissue adhesives as a safe and effective alternative to sutures. However, as a non-randomized cohort study, it represents lower-level evidence compared to randomized controlled trials due to potential selection bias. Despite this, its large sample size and long-term follow-up strengthen its clinical relevance in answering my PICO.

#### **Clinical bottom line:**

In children with traumatic skin lacerations, tissue adhesives can be a safe and effective alternative to sutures. Recent evidence shows no significant differences in cosmetic outcomes or infection rates between tissue adhesives and sutures. Overall complication rates were low as well. Although one study reported a higher early rate of wound dehiscence with tissue adhesives, it was minor and did not impact long-term healing or cosmetic results. Additionally, tissue adhesives offer several advantages such as reduced procedure time, lower cost, and a significantly decreased need for procedural sedation. All of which are beneficial in pediatric patients. While none of the studies directly measured wound healing time, the comparable cosmetic outcomes and low complication rates may suggest similar overall healing processes. For my patient, the use of Dermabond on the distal finger laceration was appropriate because of its low-tension location, while sutures were reasonably used for the dorsal metacarpophalangeal

joint due to higher tension. However, pediatric patients may pick at tissue adhesives, making proper patient and caregiver education on wound care essential.