



## Cyanoacrylate glue for hernia mesh fixation

**NICE** National Institute for  
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#### How MIBs are produced

MIBs are commissioned by NHS England and produced in support of the NHS 5-Year Forward View, as one of a number of steps which will accelerate innovation in new treatments and diagnostics.

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# Technology

Cyanoacrylate glue is a synthetic adhesive with various uses.

This briefing reviews cyanoacrylate glue for mesh fixation in hernia repair.

Several cyanoacrylate glues are currently available on the market: Ifabond® (Peters Surgical), Glubran® 2 (GEM), Histoacryl® (B Braun Surgical), LiquiBand® Fix8 (Advanced Medical Solutions)...

These cyanoacrylate glues are incompatible with certain types of mesh (such as biological or bioabsorbable meshes).

## Methodology

A literature search was carried out in accordance with the interim process and methods statement for medtech innovation briefings. This briefing reviews the most relevant or best available published evidence relating to the clinical effectiveness of the technology.

### NUMBER OF STUDIES SUMMARISED

5 studies focused on inguinal hernia repair including:

- 2 systematic reviews and 1 RCT for laparoscopic procedures
- 1 systematic review and 1 RCT for open procedures

### COMPARATORS ARE

- mechanical fixation methods (sutures, tacks, staples and self-gripping mesh)
- fibrin-based glues
- no fixation

→ 15 RCT with cyanoacrylate glue as 1 of the treatment groups

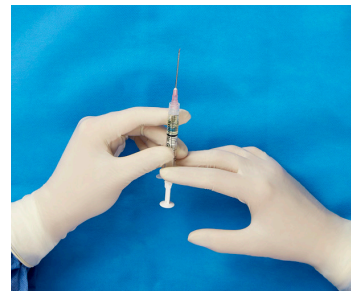
→ 3,807 patients followed

→ 1,374 patients in a protocol using cyanoacrylate glue

4 experts opinions and 6 ongoing studies were considered in the analysis

### OVERALL ASSESSMENT OF THE EVIDENCE

- The overall quantity of evidence (number and size of studies) is good
- Formal quality assessment has not been carried out
- The availability of multiple systematic reviews with meta-analyses provides some assurance of reliability and generalisability



## POTENTIAL BENEFITS OF USING CYANOACRYLATE GLUE

### COMPARED WITH MECHANICAL MESH FIXATION:

- Reduced postoperative and chronic pain
- Fewer postoperative complications, such as seroma formation or nerve injury
- Reduced risk of hernia recurrence
- Reduced length of hospital stay
- Earlier return to work and usual activities
- Improved patient quality of life.

### COMPARED WITH FIBRIN-BASED (BIOLOGIC) GLUES:

- Reduced quantity of glue needed
- Less restrictive storage and preparation conditions

## SELECTION OF PUBLISHED EVIDENCES

	Authors (year of publication)	Procedures	No. of studies		No. of patients in CYA glue RCT		Median follow-up (mths)	Products (number of studies)	Objective
			Total	CYA glue	Total	CYA glue			
LAPAROSCOPIC PROCEDURES	Habib Bedwani et al. (2021)	TAPP/TEP	15 RCT	5 RCT	552	275	12	Histoacryl®(2), Glubran®(1), Endocryl®(1), Ifabond®(1)	To compare all types of glue (including cyanoacrylate glue) with mechanical mesh fixation (sutures, tacks or staples).
	Tavares et al. (2020)	TAPP/TEP	13 RCT	5 RCT	1947	275	12	Histoacryl®(2), Glubran®(1), Endocryl®(1), Ifabond®(1)	To compare cyanoacrylate-based glue with fibrin-based glue.
	Habeeb et al. (2020)	TAPP	1 RCT		798	266	18	Histoacryl®	To compare mesh fixation using Histoacryl cyanoacrylate glue with tacks and with no fixation.
OPEN PROCEDURES	Van Steensel et al. (2019)	Open	23 RCT	8 RCT	1832	833	12	Histoacryl®(3), Glubran®(1), Glubran®2(1), Indermil(1), Ifabond®(1), Compont®(1)	Main objective: to compare adhesional or self-gripping fixation methods (including cyanoacrylate glue, fibrin glue and self-gripping mesh) with sutures. Subgroup analysis: to compare cyanoacrylate glue with sutures for postoperative pain, chronic pain and rate of recurrence.
	Matikainen et al. (2020)	Lichtenstein hernioplasty	1 RCT		625	216	60	Histoacryl®	To compare cyanoacrylate glue for mesh fixations with sutures (n=216) or self-gripping mesh (n=202).

RCT: Randomized Controlled Trial. CYA: Cyanoacrylate. TAPP: transabdominal preperitoneal. TEP: total extra-peritoneal

## EXPERTS COMMENTS

Comments on this technology were invited from clinical experts working in the field. The comments received are individual opinions and do not represent NICE's view. All 4 experts had used this technology before.

- One expert described **mesh fixation using cyanoacrylate glue as a major innovation** compared with tacking devices. Another described it as **a novel approach that enables a move away from traumatic, mechanical mesh fixation methods**.
- All experts agreed that there would be a **reduced risk of complications compared with mechanical mesh fixation methods**. Three of the experts noted the **reduced risk of chronic pain**, with 2 commenting that the incidence of nerve damage would be reduced. One also mentioned that **immediate postoperative pain was likely to be reduced**. Two experts advised that **the risk of hernia recurrence is reduced** when using glue.
- One expert thought that **thin patients** who have a low body mass index **may particularly benefit from glue use**, because they have a greater risk of nerve damage from mechanical mesh fixation methods.
- Another expert commented that **young patients** tend to have a higher rate of chronic pain, and probably **have more chance of benefit from cyanoacrylate glue use**.





## Summary

- The innovative aspects are that the use of glue limits trauma to surrounding tissues. Innovative applicators have also been developed for precise and accurate placement of the adhesive.
- These studies show that cyanoacrylate glue is as effective as alternative methods of mesh fixation, such as mechanical methods (sutures, staples and tacks) or fibrin glue.

→ The cost of cyanoacrylate glue (including applicators) for hernia mesh fixation ranges **from £97 to £230** per unit (excluding VAT) for laparoscopic procedures, and **from £65 to £230** per unit (excluding VAT) for open procedures. There is no consensus about standard mesh fixation methods in the NHS. Clinical expert advised an estimated cost of tacking devices was **appropriately £206 (ranging from £160 to £241)**. Companies and experts estimated that the cost of a box of 12 sutures ranged **from £23 to £92**.

// *There are millions of pounds of savings to be made nationally by preventing patients returning to GPs or hospitals with pain caused by the tackers put in their bodies during a hernia operation... That improves the lives of patients but also has financial savings from the prevented repeat appointments and frees up the time of those clinicians to deal with other patients. //*

Ian Dodd, Clinical Engagement and Implementation Manager, NHS Supply Chain

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