Medtronic
Engineering the extraordinary

Permacol™ surgical implant
The biological choice for chest wall reconstruction

Apply the (bio)logic

Resistant and durable[1-3,†]

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The biological choice for chest wall reconstruction

Permacol™ is a well-proven biologic implant that has been used globally in more than 350,000 patients over 12 years.[1-7]

However, in cases of chest wall resection and reconstruction caused by pulmonary disease, infection, trauma, oncologic treatment or tumours, there are still risks for patients.

What are the risks of thoracic surgery?

Even if a patient is undergoing minimally invasive thoracic surgery, there are several complications that could potentially occur including:

Infection, including pneumonia.[8]

Pain.[8]

Bleeding.[8]

Air leakage from lungs.[8]

Which patients are most at risk?

Each patient will be reviewed for thoracic surgery based on their own individual risks. However, some main risk factors include:[9]

- **Pre-existing lung diseases or cancer.**
- **Pre-existing heart diseases or conditions.**
- **Age.**
- **Male sex.**
- **Being overweight.**
- **Being a smoker.**

Permacol™ surgical implant (HDMI cross-linked acellular porcine dermis) has been associated with reliable clinical outcomes in contaminated or infected fields compared to non-crosslinked biologic meshes currently available in the market. [1,2,4,5,†]

†Use of Permacol™ surgical implant in a contaminated or infected field may lead to a weakening or breakdown of the implant. Treat any existing or suspected infection according to accepted medical practice before implanting the device.

Care for the thoracic wall

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Whether it's as a result of trauma, oncological treatment, infection or disease, thoracic surgery requires making insertions into the chest wall. Even in the case of minimally invasive surgery, some incisions will need to be made.

Typically, incisions of less than 5 cm do not require any form of reconstruction,[10] although this might not be the case depending on the patient and location or specificity of surgery required. In the case of larger incisions, mesh may be required to support the soft tissue in the chest wall.

Meshes present the advantages of easy manipulation and handling and comply with the characteristics of ideal prosthetic material as determined by Le Roux and Sherma:[10]

- **rigidity** to abolish paradoxical movement
- **inertness** to allow in-growth of fibrous tissue and decrease the likelihood of infection
- **malleability** to fashion to the appropriate shape at the time of operation
- **radiolucency** to create an anatomic reference to do a better follow up and identify a possible local neoplastic relapse

Using synthetic meshes in thoracic surgery

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Typically, synthetic mesh has been the material of choice for thoracic surgery because it's simple to use and usually well-tolerated.[10]

However, biological mesh has been shown to hold less risks:

1. **Use biological implants for soft tissue and chest wall reconstruction in thoracic surgery.**
2. **Biological mesh allows for native tissue re-growth.[10]**
3. **The ability to revascularize.[10]**
4. **One study showed that infection rates were low even when procedures were carried out in a contaminated field.[11,†]**
5. **One of the main characteristic of biological materials is the possibility to be used in contaminated or infected fields.[†,12]**

Studies show that using biological patch material for reconstruction of the thoracic wall is feasible and reliable. Excellent wound healing, long-term stability, low complication, and good pulmonary function were achieved even in large defects.[11-13,†]

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Using bioprosthetic meshes in thoracic surgery

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Bioprosthetic meshes have been shown to be beneficial in chest wall resection and reconstruction surgery.[11-13,†]

Permacol™ surgical implants in a challenging environment:

Although bioprosthetic meshes can be more expensive and difficult to handle, they do have significant benefits when used in thoracic surgery, including:

The ability to revascularize and integrate quickly into native tissues.[1-3]

Infection resistance.[10,†]

Effective wound healing and long-term stability, even in large surgeries.[1-3,13]

A crosslinked structure that provides strength, durability and flexibility thanks to their micr ofibrils made of chemically connected collagen molecules.[1-3]

In short, choosing bioprosthetic meshes rather than synthetic meshes for chest wall reconstruction, particularly in large or contaminated cases, can improve patient outcomes.[1,2,6,14]

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Make the (bio)logical choice

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Choose Permacol™ surgical implant

A Permacol™ surgical implant is a tough and flexible fibrous flat sheet of crosslinked acellular porcine dermal collagen and constituent elastin fibres.†

An alternative to synthetic meshes, Permacol™ is a well-proven biologic implant that has been used globally in a range of surgical procedures, including for hernia and abdominal wall repair.[1,2]

Available in a range of sizes and with no rehydration or refrigeration required, Permacol™ surgical implant is ready to use when needed and will provide dimensional stability, whatever the size of the defect.

Thanks to the unique crosslinking technology, which is formed in a chemical process using HMDI (Hexamethylene Diisocyanate), Permacol™ surgical implant offers advantages over other collagen-based implants which are not crosslinked for hernia and abdominal wall repair.[2,3,15]

† See IFU_PT00099456 Permacol

‡ Use of Permacol™ surgical implant in a contaminated or infected field may lead to a weakening or breakdown of the implant. Treat any existing or suspected infection according to accepted medical practice before implanting the device.

There are three main advantages that Permacol™ provides over biosynthetic implants:

Biocompatibility

Studies have shown that Permacol™ has good fibroblastic and neovascular infiltration, excellent biocompatibility and resistance to degradation in potentially contaminated sites.[1-3,‡]

Strength and durability

Permacol™ has shown greater tensile strength compared to non-crosslinked implants. While human cadaveric grafts and other non-crosslinked grafts may initially be successful, many lose tensile strength and have increased tissue laxity over time.[16-20]

Dimensional stability

Optimal cross-linking and gentle processing methods means the Permacol™ surgical implant offers long-lasting dimensional stability. This ensures the integrity of the collagen graft through the body's wound healing process.[1-3]

To find out more about the benefits Permacol™ surgical implant can offer you and your patients, head to **www.medtronic.com/covidien/en-gb/products/hernia-repair/permacol-surgical-implant.html**

Order code	Description	Thickness	Dimensional area	Quantity
5220-100	Permacol™	1.0 mm	2 × 20 cm	1
5033-100	Permacol™	1.0 mm	3 × 3 cm	1
5416-100	Permacol™	1.0 mm	4 × 16 cm	1
5418-100	Permacol™	1.0 mm	4 × 18 cm	1
5000-100	Permacol™	1.0 mm	5 × 5 cm	1
5001-100	Permacol™	1.0 mm	5 × 10 cm	1
5616-100	Permacol™	1.0 mm	6 × 16 cm	1
5816-100	Permacol™	1.0 mm	8 × 16 cm	1
5110-100	Permacol™	1.0 mm	10 × 10 cm	1
5115-100	Permacol™	1.0 mm	10 × 15 cm	1
5210-100	Permacol™	1.0 mm	10 × 20 cm	1
5152-100	Permacol™	1.0 mm	15 × 20 cm	1
5120-100	Permacol™	1.0 mm	18 × 28 cm	1
5230-100	Permacol™	1.0 mm	20 × 30 cm	1
5033-150	Permacol™	1.5 mm	3 × 3 cm	1
5063-150	Permacol™	1.5 mm	3 × 6 cm	1
5000-150	Permacol™	1.5 mm	5 × 5 cm	1
5001-150	Permacol™	1.5 mm	5 × 10 cm	1
5110-150	Permacol™	1.5 mm	10 × 10 cm	1
5115-150	Permacol™	1.5 mm	10 × 15 cm	1
5152-150	Permacol™	1.5 mm	15 × 20 cm	1
5120-150	Permacol™	1.5 mm	18 × 28 cm	1
5230-150	Permacol™	1.5 mm	20 × 30 cm	1
5240-150	Permacol™	1.5 mm	20 × 40 cm	1
5250-150	Permacol™	1.5 mm	20 × 50 cm	1
5284-150	Permacol™	1.5 mm	28 × 40 cm	1

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Important: Please refer to the package insert for complete instructions, contraindications, warnings and precautions.

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