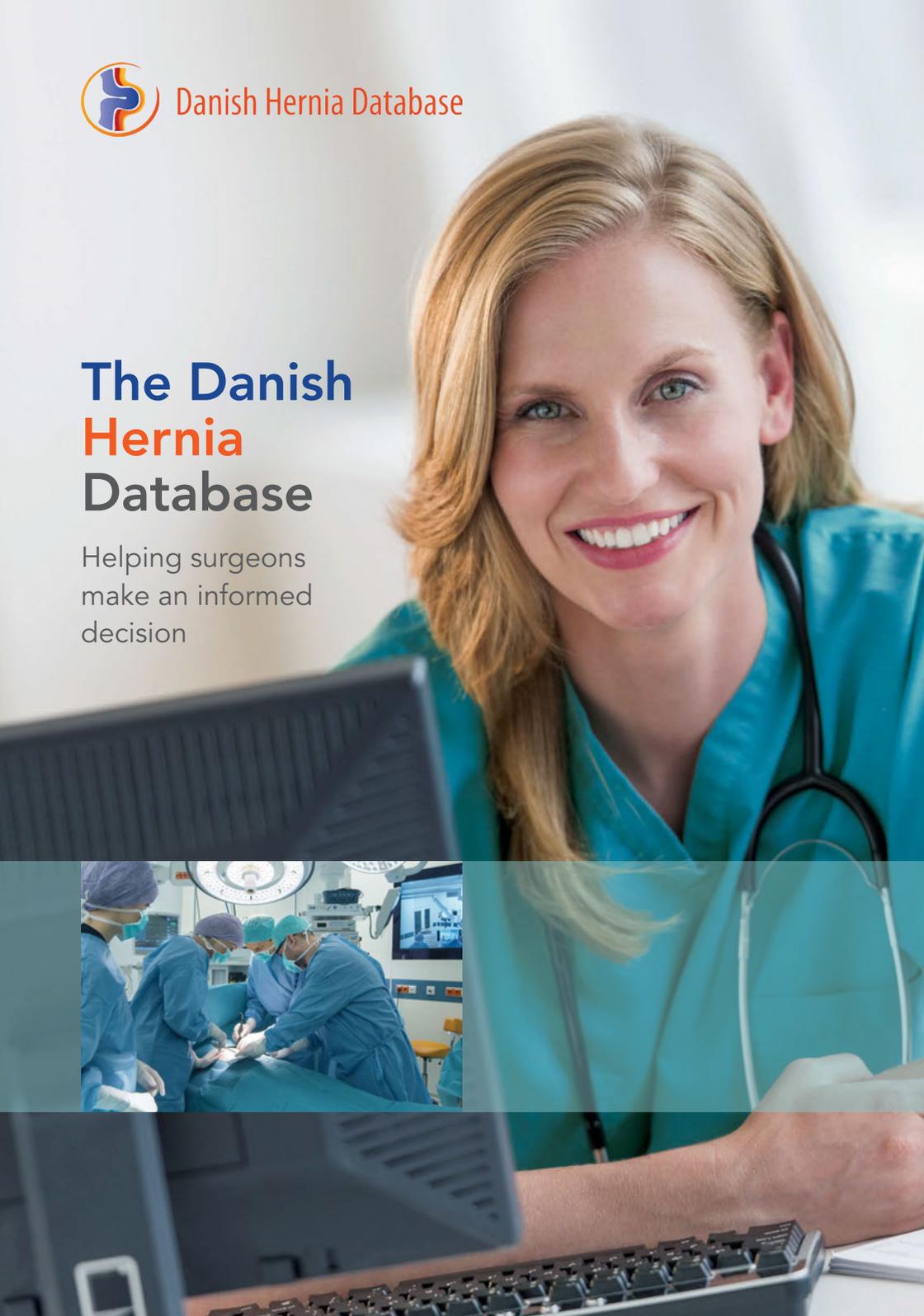![Danish Hernia Database]

The Danish Hernia Database

Helping surgeons make an informed decision

The Danish Hernia Database

Recommendations for the treatment of ventral hernia anno 2018
Nadia A. Henriksen, MD, PhD & Frederik Helgstrand, MD, DMSc

Introduction

The Danish Hernia Database (DHD) provides national surveillance of current surgical practice and clinical postoperative outcomes. The intention is to reduce postoperative morbidity and hernia recurrence, evaluate new treatment strategies, and facilitate nationwide implementation of evidence-based treatment strategies.
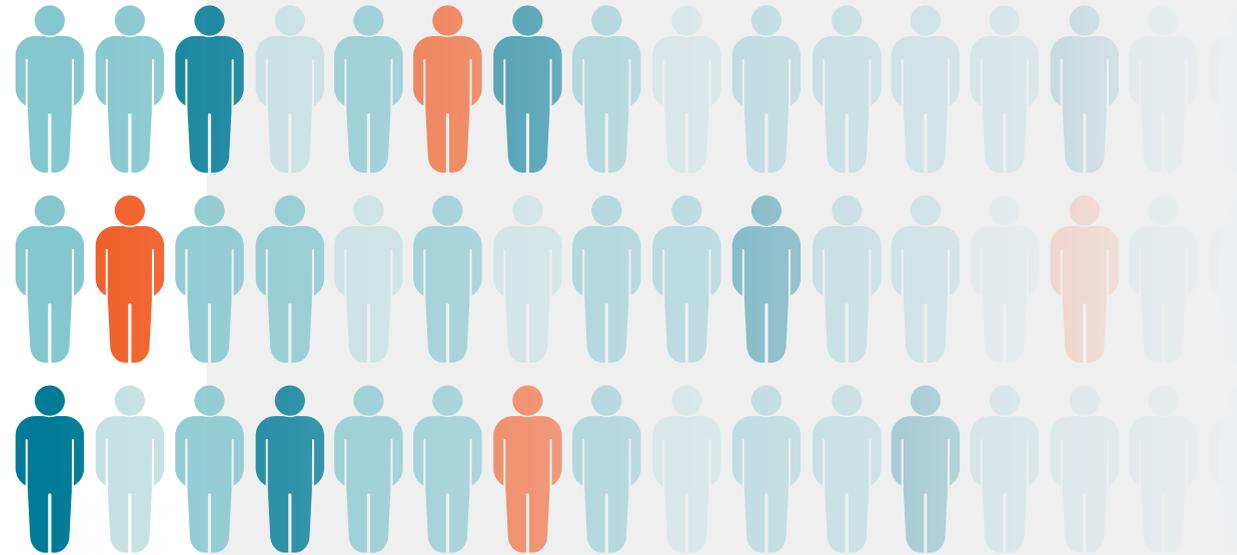
It is mandatory for all surgeons to register their hernia repairs (elective or emergent) in the DHD, regardless if operated in a public or private setting. By using patients unique civil registration number a continuous follow-up is performed by a preprogrammed and automatic merge of data with data from the Danish National Patient Register (DNPR), which holds data from all patient contacts with the Danish health care providers (private and public), including operations.

Results from DHD along with current evidence from other studies are presented to the Danish surgical society at two annual meetings. At these meetings guidelines and recommendations are discussed and continuously revised.

The guidelines are published on the website of the hernia database
www.herniedatabasen.dk

Keep up to date with twitter
@DanishHernia

Since most surgical departments are represented in the meetings, implementation of new guidelines and recommendations are adopted almost instantaneously. Based on current evidence from the literature and DHD, Danish surgeons agreed on the following guideline for the treatment of ventral hernias in December 2017.

The choice of treatment always depends on the individual patient. Therefore, the present guideline is meant as a tool to support the clinical decision making and for some patients, deviations from the guideline can be a better solution.

To make an informed decision

Ventral hernia classification

Ventral hernias can be divided into primary hernias including umbilical, epigastric and Spigellian hernias and secondary hernias occurring in a former incision (incisional hernias). The European Hernia Society (EHS) classifies ventral hernias according to the location, defect width and whether they are primary or secondary.

In Denmark, we agreed on a simpler classification based on the suggested treatment strategy described below and depending primarily on the width of the defect. A defect width of 0-2 cm are small hernias, >2-6 cm are medium sized and >6-10 cm are considered large hernias. Hernias with a defect width >10 cm, loss of domain, flank, subcostal and parastomal hernias, are considered complex hernias.

Preoperative optimization

Patients who smoke, are obese or have poorly regulated diabetes, have an increased risk of getting postoperative complications such as surgical site infection and hernia recurrence. Therefore, smoking cessation is recommended 6 weeks prior to surgery. Weight loss to a body mass index of less than 35 kg/m^2 is encouraged. Diabetes treatment should be optimized to a glycated haemoglobin A1C (HbA1C) level of 60 mmol/mol or 7.5%. For complex hernias preoptimization is considered mandatory.

Choice of surgery, laparoscopic or open approach

Open approach is suitable for small hernias. Medium sized hernias may be repaired laparoscopically or by open approach. Choice of approach should always depend on surgeon's expertise. Further, laparoscopic approach is associated with fewer wound complications, but the severity of complications may be higher than with the open technique.

Nevertheless, laparoscopic repair seems to be a better solution for especially obese, smokers and diabetic patients. Laparoscopic surgery may also have advantage for repairing non-midline hernias. Although data from DHD shows no differences in reoperation rate and recurrence rate when comparing laparoscopic and open surgery regardless of the defect size, it is suggested that patients with large hernias are operated by an open approach. The reason for this is, that it is difficult to close the defect and achieve sufficient mesh overlap laparoscopically. More data are warranted to support the use of robots as an alternative to open surgery for large hernias.

Complex hernias should be repaired by open approach and only in expert centers. In Denmark it is mandatory to refer complex hernia patients (elective or emergent) to one of the five expert centers in the country.

Sutured repair or mesh repair

There is no doubt that mesh repair reduces recurrence rate when compared to sutured repair for all types of ventral hernia repairs including small hernias. For small hernias, mesh repair leads to a slightly increased rate of readmissions, however, the rate of re-operation and chronic pain is not increased.

Thus, it is recommended to use mesh reinforcement regardless of hernia size. For fertile women, it is recommended that small umbilical and epigastric hernia repairs are postponed until after last pregnancy. If surgery is required prior to that, sutured repair may be a good choice, since mesh repair before pregnancy does not decrease the risk of recurrence during pregnancy or after delivery.

Closure of defect

It is recommended that the defect is closed with a non-absorbable suture for both open and laparoscopic hernia repair. Data from DHD shows that the rate of re-operation for recurrence is decreased when the defect is closed. Further, studies indicate that bulging and seroma formation is decreased when the defect is closed laparoscopically.

Mesh position

It is recommended to place the mesh in a retromuscular or preperitoneal position if possible for medium sized and large defects. Inlay mesh placement is not recommended as it increases recurrence rate. Intraperitoneal mesh placement may be associated with adhesion formation and fistulation. Onlay mesh placement increases the risk of surgical site occurrences for large hernias, but data from DHD shows that it is safe to use for small and medium sized hernias. There is no difference in rate of re-operation for recurrence between onlay, preperitoneal, retromuscular and intraperitoneal mesh placement.

ONLAY — RETROMUSCULAR — INTRAPERITONEAL (IPOM) — PREPERITONEAL — SUBLAY
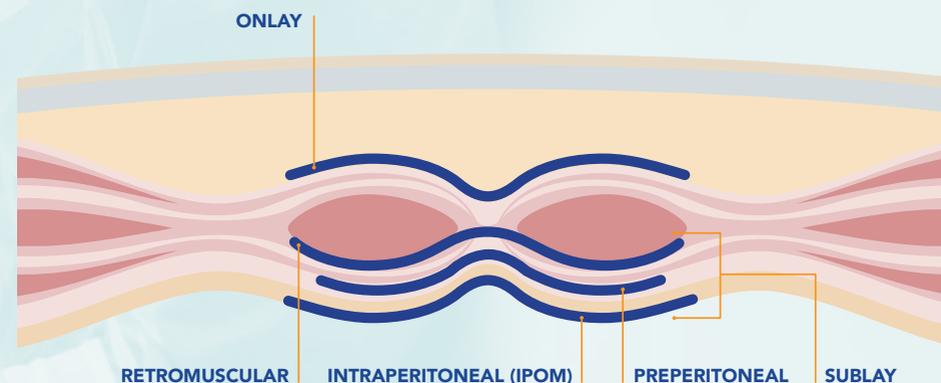
Mesh overlap

The evidence for best mesh overlap is limited. For a long time, a mesh overlap of at least 5 cm has been suggested irrespective of the size of the defect. However, based on the law of Laplace it is recommended that the overlap increases with the size of the defect, and a mesh to defect ratio above 14-16 has been suggested. There is no evidence in the literature or data from DHD to suggest best mesh overlap to date. Thus, in Denmark we pragmatically agreed on the recommendations described.

Mesh fixation

For laparoscopic intraperitoneal mesh placement, it is recommended to use non-absorbable tacks or sutures, as the use of absorbable tacks increase the recurrence rate. In open repair, mesh fixation depends on the position of the mesh. In sublay position, mesh fixation may not be necessary as long as the mesh is smoothened out on the surface and cannot move out of position. In onlay position, some kind of mesh fixation is recommended in order to maintain the mesh position.

Ventral Hernia Algorithm

Preoperative optimization
- Smoking cessation 6 weeks before surgery
- Weight loss to BMI < 35 m^2/kg
- Diabetes control, HbA1C < 60 mmol/mol

Defect width	Type of repair	Mesh placement	Mesh overlap
0-2 cm	open	onlay/ sublay	min. 1 cm
2-6 cm	open	sublay	min. 3 cm
	laparoscopic	IPOM	min. 5 cm
6-10 cm	open	sublay	min. 5 cm

0-2 cm small hernias

It is recommended to repair small hernias with an open approach with the mesh placed preperitoneally or in an onlay position with a mesh overlap of minimum 1 cm. The defect should be closed with non-absorbable suture. For women of childbearing age, a sutured repair is an option.

2-6 cm medium sized hernias

A Rives-Stoppa approach with retromuscular mesh placement is an option in the larger midline defects, but onlay, preperitoneal or intraperitoneal mesh position can also be considered for open repairs. The mesh overlap is suggested to be minimum 3 cm.

For laparoscopic repair, the defect is closed with a non-absorbable suture and the mesh is placed intraperitoneally (IPOM) and fixated with non-absorbable tacks. The mesh overlap is suggested to be minimum 5 cm. A robot-assisted approach may be used, but there is not yet enough data from the DHD or the literature to support this.

6-10 cm large hernias

A Rives-Stoppa repair is suggested with retromuscular mesh placement. In order to close the anterior and posterior rectus sheath, it may be necessary to add botox injections to the lateral abdominal muscles 4 weeks prior to surgery and/or use transversus abdominus release (TAR) or endoscopic/open anterior component separation.

Complex hernias

The rate of wound complications, reoperations and mortality is increased for patients with complex hernias (defect width >10 cm, loss of domain, flank, subcostal and parastomal hernias), and it is therefore suggested that complex hernias are repaired at a specialized hernia center, with perioperative expertise and setup for the treatment of these complicated patients.

Should be referred to specialized hernia center

Table showing the level of evidence behind the recommendations

	Level of evidence
Smoking cessation 6 weeks before surgery	2a
Weight loss to a body mass index < 35 kg/m^2	2a
Diabetic control, HbA1C < 60 mmol/mol	2a
Surgical approach based on defect width	5
Choice of laparoscopic or open approach	5
Mesh repair for umbilical and epigastric hernias	1a
Mesh repair for incisional hernias	1a
Defect closure for laparoscopic repair	3a
Mesh position	2b
The size of mesh overlap	3a

INTERNATIONAL HERNIA CONGRESS
HERNIA 2021

26 - 29 MAY 2021
Copenhagen - Denmark

Produced in association with

Medtronic