

# Early or late drain removal after pancreatic surgery

<b>Submission date</b>	<b>Recruitment status</b>	<input checked="" type="checkbox"/> Prospectively registered
10/04/2018	No longer recruiting	<input type="checkbox"/> Protocol
<b>Registration date</b>	<b>Overall study status</b>	<input type="checkbox"/> Statistical analysis plan
11/05/2018	Completed	<input type="checkbox"/> Results
<b>Last Edited</b>	<b>Condition category</b>	<input type="checkbox"/> Individual participant data
08/06/2023	Surgery	<input type="checkbox"/> Record updated in last year

## Plain English summary of protocol

### Background and study aims

Abdominal drains are sometimes placed during surgery in order to minimize the risk from bowel contents or other dangerous fluids collecting in the abdomen. This practice has been reduced in many branches of surgery during the last decades as the benefit of this treatment is questionable and the risk associated with having drains (plastic tubes) inside the abdomen is inevitable. When it comes to pancreatic surgery the risk from leakage of pancreatic juice into the abdominal cavity is high and the routine use of drains is therefore the standard of care. The drains are usually left in place for a minimum of 3 days after surgery and then removed if no signs of leakage are found. There are results available from earlier research indicating that drains can safely be removed as early as one day after surgery if no leakage is present. The aim of this study is to find out whether early drain removal after pancreatic surgery shortens hospital stay.

### Who can participate?

Patients undergoing removal of the pancreatic head and associated tissue (Whipple operation) and with normal concentration of drain amylase (pancreatic enzyme) the day after surgery

### What does the study involve?

Participants are randomly allocated to undergo either early drain removal (one day after surgery) or conventional drain removal (at earliest three days after surgery). Their treatment is otherwise according to hospital standards and the follow up (within the study) is 90 days. Length of hospital stay is measured at discharge.

### What are the possible benefits and risks of participating?

The possible benefits of participating are that early drain removal may shorten hospital stay and reduce the risk of drain-associated complications. The main risk is that the normal drain amylase on the day after surgery may not completely exclude leakage and therefore longer drain treatment could be of value.

### Where is the study run from?

1. Linköping University Hospital (Sweden)
2. Skånes University Hospital (Sweden)

3. Sahlgrenska University Hospital (Sweden)

4. Oslo University Hospital (Norway)

When is the study starting and how long is it expected to run for?

April 2017 to December 2025

Who is funding the study?  
Investigator initiated and funded

Who is the main contact?

Dr Berghor Björnsson  
bergthor.bjornsson@liu.se

## Contact information

### Type(s)

Scientific

### Contact name

Dr Berghor Björnsson

### Contact details

Linköping University Hospital

Linköping

Sweden

58185

+46 (0)703766890

bergthor.bjornsson@liu.se

## Additional identifiers

### Protocol serial number

DrainRemovalStudy1.1

## Study information

### Scientific Title

Post-operative drainage after pancreaticoduodenectomy: a randomized controlled trial of early drain removal vs late drain removal

### Study objectives

Early drain removal after pancreaticoduodenectomy shortens hospital stay.

### Ethics approval required

Old ethics approval format

### Ethics approval(s)

Regional Ethical Review Board, Linköping, Sweden, 16/10/2017, ref: Dnr 2017/310-31

### Study design

Prospective randomized study

## Primary study design

Interventional

## Study type(s)

Treatment

## Health condition(s) or problem(s) studied

Pancreatic disease treated with pancreateoduodenectomy

## Interventions

The randomisation will be by online websolution after the results of drain amylase POD 1 are known and within the inclusion limits of the study. There are two treatment arms:

1. Early drain removal (POD 1)
2. Conventional drain removal earliest on POD 3 when no pancreatic fistula exist according to the definition of POPF (postoperative pancreatic fistula)

The treatment will otherwise be according to hospital standards and the follow up (within the study) is 90 days.

## Intervention Type

Procedure/Surgery

## Primary outcome(s)

Hospital stay, measured at discharge

## Key secondary outcome(s)

1. Overall morbidity rate classified as Clavien-Dindo  $\geq 3a$  within 90 days
2. Mortality rate (in-hospital, 30 and 90 days)
3. Overall morbidity rate as classified by Clavien-Dindo within 90 days
4. Fistula rate according to ISGPF (grade B and C fistulas) within 90 days
5. Intraabdominal abscess rate within 90 days
6. Wound infection rate within 90 days
7. Delayed gastric emptying according to ISGPF within 90 days
8. Postpancreatectomy bleeding according to ISGPF within 90 days
9. Need of interventional radiology within 90 days
10. Need for reoperation within 90 days
11. Readmission rate within 90 days

## Completion date

31/12/2025

## Eligibility

### Key inclusion criteria

Patients planned for pancreateoduodenectomy with high risk for anastomosis leakage

### Participant type(s)

Patient

**Healthy volunteers allowed**

No

**Age group**

Adult

**Sex**

All

**Key exclusion criteria**

Low risk for anastomosis leakage

**Date of first enrolment**

01/09/2018

**Date of final enrolment**

31/08/2025

## Locations

**Countries of recruitment**

Norway

Sweden

**Study participating centre**

**Linköping University Hospital**

Linköping

Sweden

58185

**Study participating centre**

**Skånes University Hospital**

Lund

Sweden

22242

**Study participating centre**

**Sahlgrenska University Hospital**

Gothenburg

Sweden

41345

**Study participating centre**  
Oslo University Hospital  
Oslo  
Norway  
0372

## Sponsor information

**Organisation**  
Region Östergötland

**ROR**  
<https://ror.org/0326gsy75>

## Funder(s)

**Funder type**  
Other

**Funder Name**  
Investigator initiated and funded

## Results and Publications

### Individual participant data (IPD) sharing plan

The data sharing plans for the current study are unknown and will be made available at a later date. Additional documents (such as study protocol, statistical analysis plan) will not be made available online at this time.

### IPD sharing plan summary

Data sharing statement to be made available at a later date

### Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Participant information sheet</a>	Participant information sheet	11/11/2025	11/11/2025	No	Yes