Cover page protocol

Study protocol with Statistical Analysis Plan

NCT: 987718 (Regional ethics committee Norway)

Study title: A prospective cohort study with emphasis on patient reported outcomes and different renal artery clamping techniques during robot assisted kidney resection – the RAPTOR study

Date: 15.06.2026

A prospective cohort study with emphasis on patient reported outcomes and different renal artery clamping techniques during robot assisted kidney resection – the RAPTOR study

RAPTOR «**R**obot **A**ssisted **P**artial kidney resection with **T**ransperitoneal **O**r **R**etroperitoneal access»

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I have read and approved this protocol. My signature, in conjunction with the signature of the investigator below, confirms the agreement of both parties, that the clinical study will be conducted in accordance with the protocol and all applicable laws and regulations including the ethical principles that have their origins in the Declaration of Helsinki, and applicable laws in the involved country.

_____

Bjarte Almås, Sponsor signature

INVESTIGATOR SIGNATURE

I have read and approve this protocol. My signature, in conjunction with the signature of the sponsor above, confirms the agreement of both parties, that the clinical study will be conducted in accordance with the protocol and all applicable laws and regulations including the ethical principles that have their origins in the Declaration of Helsinki, and applicable laws in my country. Nothing in this document is intended to limit the authority of a physician to provide emergency medical care under applicable regulations.

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Investigator name (print) Investigator signature Date of signature (DD MM YYYY)

SUMMARY:

Title	Retroperitoneal versus transperitoneal resection of renal tumours – The RAPTOR study. A prospective cohort study with emphasis on patient reported outcomes and different renal artery clamping techniques. RAPTOR «**R**obot **A**ssisted **P**artial kidney resection with **T**ransperitoneal **O**r **R**etroperitoneal access»
Sponsor	Bjarte Almås, MD, PhD Department of Urology, Haukeland University Hospital
Research objectives	Comparison of the short- and long term postoperative recovery after robot assisted kidney resection comparing two different surgical methods. The study also includes a randomized arm comparing two different clamping techniques during kidney resection.

Selection criteria (inclusion and exclusion)	Inclusion Criteria 1. Signed written informed consent obtained prior to any study specific procedures 2. Patient must be willing and able to comply with the protocol 3. Age ≥18 4. Patients scheduled for robot-assisted partial kidney resection with either the trans- or retroperitoneal access **5.** Other patients scheduled for surgery for kidney cancer, to be included as control group Exclusion criteria 6. Previous kidney surgery on the affected side 7. Preexisting extensive intraabdominal adhesions preventing the use of the transabdominal access 8. Preexisting severe pain condition requiring regular use of opioids adding up to more than equivalent of 10mg po morphine daily 9. Any other physical or mental illness that according to the treating surgeon makes the patient unfit for inclusion in the study 10. Confirmed metastatic renal cancer or any other metastatic cancer.

Study treatment	The study consists of two cohorts of patients treated with robot assisted kidney resection. An additional cohort of will serve as a control group. Cohort A will consist of patients treated with a transabdominal access (t-RARP) Cohort B will consist of patients treated with a retroperitoneal access (r-RARP) Cohort C will consist of all other patients treated surgically for kidney cancer with open, laparoscopic or robot-assisted nephrectomy. Regarding the arm studying clamping techniques, a stratified randomization will be performed to ensure equal number of patients from cohort A and B in this part of the study.
Number of patients	Minimum 88. As the inclusion will continue until minimum 44 patients is included in both cohort A and B, and the study will include all nephrectomies as a control group, it is probable that the entire study population will consist of 130-150 patients at end of inclusion.
Duration of the study	4 years inclusion + 5 years follow-up. Final date of study analysis is 31 decembers 2036.
Methodology	Prospectiveand observational cohort study

Primary and secondary endpoints For a detailed description of the variables and statistical methods used, see section 7, Statistical considerations and analytical plan	Primary endpoints: PROMS arm: The primary endpoint is postoperative pain the first post-operative day (1POD) comparing t-RAPN to r-RAPN. The pain will be measured as the difference between baseline (before surgery) to pain measured the first post-operative day using items 3-6 in the BPI form. Clamping arm: The primary endpoint is intraoperative bleeding during kidney resection comparing the two different clamping strategies. The bleeding will be measured as ml bleeding Secondary endpoints: • To detect whether there is difference between the groups in opioid use during the first 24 hours after surgery. We will converse opioid use to morphine equivalents using table in attachment 5 in the protocol. Total opioids use the first 24 hours after the patient arrived in the recovery unit will be the variable used for analysis. • To detect potential differences in pain between the groups at 6 weeks and one year after surgery. Potential differences will be measured as difference between baseline and follow up at 6 weeks or one

	year. For this endpoint, the average score of the BPI form (items 3-6 + 9-15) will be used. • To detect potential differences in recovery between the groups at first post-operative day, 6 weeks and one year after surgery. Potential differences will be measured calculating the total score (0-150 points) of the Quality of Recovery 15-NO (QoR-NO) form. The score will be calculated as the difference will between baseline and follow up at 1 POD, 6 weeks or one year. • To detect potential differences in Quality of life (QoL) between the groups at 6 weeks and one year after surgery. Potential differences will be measured using the EORTC-QLQ-30 comparing baseline to 6 weeks or 1 year after surgery. The variables used for analysis will be the averages of the total score, but sub-analyses will also be performed for the different functional and symptom scales within the form • To detect potential differences in sick leave between the groups at 6 weeks and one year after surgery. Sick leave will be calculated counting the total days of kidney surgery related sick leave

	from discharge to follow up at 6 weeks and 1 year. • To detect potential differences between the groups in surgical margins, postoperative complications and bleeding, warm ischaemia time, operation time and length of stay. Warm ischaemia time and operation time will be measured in minutes. Complications will be measured and compared using the Clavien-Dindo scale (attachment 6) and bleeding will be measured in units transfusions given. Length of stay will be measured as days between admission and discharge. • To detect potential differences in the relevant groups regarding recurrence free, disease specific and overall survival outcomes at 1,3- and 5-years follow-up. All survival outcomes will be measured using the Kaplan-Meier method • To detect potential differences in kidney function after 1,3- and 5-years follow-up. Potential differences will be measured comparing the e-GFR measured preoperatively to e-GFR at 1,3 and 5-years follow-up

Power calculation and statistical analyzis	• We intend to include patients prospectively until we have minimum 44 patients in both groups A and B, potentially resulting in one group being larger than the other. We expect the control group (group C, other patients surgically treated for kidney cancer) to consist of fewer patients at the end of inclusion.

Main abbreviations

r-RAPN	Robot assisted partial nephrectomy with retroperitoneal access
t- RAPN	Robot assisted partial nephrectomy with transperitoneal access
WIT	Warm ischaemia time
EBL	Estimated blood loss
PROMs	Patient reported outcome measures
BPI	Brief pain index form
QoR-n	Quality of recovery – Norwegian version
LOS	Length of stay
QoL	Quality of Life
RFS	Recurrence free survival
DSS	Disease free survival
OS	Overall survival

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1. Background and rationale

1.1. Treatment of renal cell carcinoma

Renal tumours can be treated with surgical excision, observation or ablative techniques [1]. Historically, tumours were treated with open radical nephrectomy, but advances in surgery have led to widespread use of kidney resection using mini-invasive techniques such as laparoscopic or robot-assisted resection for T1 renal cancers [2-6]. Partial nephrectomy aims to preserve renal function with equivalent oncological outcomes and perioperative complications compared with radical nephrectomy. Both transperitoneal and retroperitoneal laparoscopic partial nephrectomy have been in use since early 2000s[7].

1.2. Surgical access during partial nephrectomy

During a transperitoneal laparoscopic or robot-assisted kidney resection, the patient is placed in an oblique position, with the trocars placed intra-abdominally in a paramedian line on the affected side[8, 9]. The advantages with this access include a large surgical space with several known anatomical landmarks making the surgery more familiar to the surgeon. Access to ventral tumours would normally be easier with this access. Potential disadvantages to this access include the risk of unintentional injury to the intra-abdominal organs such as the bowel, spleen or liver. The access to the renal hilum requires dissection of the colon as this lies in front of the kidney. Furthermore, access to posterior renal tumours might require the complete mobilization of the kidney to access the posterior side. This can be challenging and time consuming. During a retroperitoneal laparoscopic or robot-assisted kidney resection, the patient is placed in the lateral position [10]. A special balloon is used to develop the retroperitoneal space, and all trocars are placed retroperitoneally. The advantages include that the intraabdominal organs are avoided, and direct access to the renal hilum can be readily achieved. The posterior surface of the kidney is easily dissected to access posterior tumours. An additional advantage could be that mini-invasive surgery is feasible even in cases where the abdominal cavity in inaccessible to surgery due to intra-abdominal adhesions. A disadvantage could be a smaller surgical space with fewer anatomical landmarks possibly resulting on a longer learning curve for the surgeon.

Numerous papers have been published regarding the comparison of the methods. One early, randomized study comparing laparoscopic retroperitoneal and transabdominal access concluded that the retroperitoneal access was faster, but that the outcomes otherwise were similar [7]. Several later studies comparing robot-assisted kidney resection (r-RAPN) with the transperitoneal approach (t-RAPN) conclude in much the same way. A retroperitoneal approach seems to result in shorter operation time, shorter hospital stays and possibly less intraoperative complications [11, 12]. Oncological short – and long-term results are however described to be similar. Altogether, the literature concludes that both the transperitoneal and retroperitoneal access are feasible and good surgical options, and that the choice of access is at the discretion of the surgeon depending on tumour location and surgeon experience [1, 13].

1.3. Resection and suturing during partial nephrectomy

Another issue that is debated during kidney resections, are different clamping and suturing techniques, and its potential effect on warm ischemia time and post operative kidney function. Clamping of the arterial blood supply to the kidney is performed with a bulldog clamp that closes the lumen of the artery without causing injury to the vessel after removal. The goal of such a clamping is to minimize blood loss during resection and improve visibility during resection to ensure a radical and safe resection.

During a standard kidney resection, the renal hilum is first dissected. The renal artery or arteries and often the renal vein is exposed and secured for clamping. The tumour is then identified, and the kidney is mobilised sufficiently to facilitate resection. After the tumour resection, the suturing is typically performed in a two - step process. First the resection surface is sutured to close the larger vessels and the collecting system, and after that a renorraphy is performed to adapt the resection edges and to stop potential remaining bleeding. Finally, some haemostatic agent is commonly distributed to the area.

1.4. Different methods for clamping and declamping during kidney resection

Most often, some sort of clamping of the renal artery (ies) is performed before resection. This minimizes blood loss during the resection and ensures sufficient visibility for a safe and accurate resection. A pure *off clamp* technique is described where no such clamping is performed [14]. This would avoid renal ischaemia but would also increase the bleeding during resection and can be technically challenging. The results are varying, but some authors have described acceptable results[15, 16]. A *selective clamping*, where only the vessels supplying the tumour are clamped, is also described. This would require a more meticulous dissection of the renal hilum and can also be technically challenging [17]. The most used technique is a total clamping of all arteries supplying the entire kidney. The clamping is placed before resection and stays on until the first suturing in the renal parenchymal after resection is performed. One option is then to declamp the renal artery before the described renorraphy is performed. This is in the literature called an ***early declamping*** [18]. The other option is to let the clamp stay on until after the renorraphy, called a ***standard declamping***. The early declamping technique would reduce warm ischaemia time (WIT) but might cause increased bleeding compared to standard declamping.

The question about what duration of ischaemia is acceptable is controversial and under debate. Some authors advocate the importance of a short ischaemia time while others claim the time in itself is less important, and achieving the surgical *trifecta* should always be first priority [19]. Surgical trifecta is used as a quality benchmark during kidney resection, and is defined as negative surgical margins, absence of major surgical complications and preservation of kidney function after surgery. It is commonly agreed that a normal kidney can withstand up to 20 minutes WIT without sustaining permanent injury, but a longer ischaemia time could cause permanent damage to the remaining part of the kidney and thus affect the mentioned surgical trifecta.

1.5. Rationale for PROMS arm of the study

Existing literature has focused on perioperative outcomes, such as perioperative complications, blood loss, length of stay or warm ischaemia time during surgery. Focus has also been on oncological outcomes, such as surgical margins and survival results. Much less focus has been on the post-operative period including postoperative pain and recovery or quality of life measured using patient reported outcome measures (PROMs). To our knowledge, the only study specifically looking at these factors is a single centre study from Japan. The authors used QoR40, a survey assessing recovery from surgery. They used this survey to compare patients treated with r-RAPN compared to t-RAPN. The patients filled in forms only in the perioperative phase, and last time at day of discharge. No follow-up on these factors after discharge from hospital was performed. The authors concluded that recovery for the retroperitoneal access was superior to the transabdominal access. [20].
At HUS we have taken up kidney resection with a retroperitoneal access since April 2024. The impression in the department is that this access provides a beneficial addition to the existing surgical methods we have used, especially regarding posterior tumours. Currently, about 40-50% of the patients are selected for retroperitoneal access. Our impression is further that these patients experience less postoperative pain, shorter time before bowel movement and perhaps shorter hospital stays. There is a lack of high-level evidence on potential differences in postoperative outcomes regarding pain and recovery using PROMs outcomes, and we see the possibility to perform a study where we look at these factors. We plan to perform a prospective study to address this existing knowledge gap regarding postoperative recovery after kidney surgery.

1.6. Rationale for the declamping arm of the study

In the present study, we aim to prospectively include patients scheduled for kidney resection. We see here an opportunity to compare different clamping strategies. We plan to randomize the patients to either early or standard declamping. Since another aim of the study is to compare retro and abdominal access, we plan to perform a stratified randomization to ensure equal distribution of the declamping strategies in the two main groups. An illustration of the plan is shown in figure 1 in section 3 below. When discussing different clamping strategies during kidney resection, critical parameters to consider is the WIT, bleeding during resection and the incidence of post-operative complications. Estimated blood loss (EBL) during resection varies greatly between publications, but a recent systematic review on all relevant publication on the topic showed an EBL of 162 ml during robot assisted kidney resection and an incidence of major complications of 2,9% [21]. The two largest most recent publications on robot assisted kidney resections found an EBL of 47ml and 158ml with a standard deviation of 67 and 49ml (n= 804 and 784) accordingly [22, 23]. Previous studies have found that early declamp can reduce WIT without causing increased bleeding or complications [18, 24]. Indeed, a recent study from Japan showed that early declamping strategy reduced WIT with 9 minutes and reduced declined renal function post-operatively [25]. The authors of that study found a moderate increased bleeding of 50ml in the early declamping group. The two different clamping strategies and their potential effect on WIT is illustrated in figure 2. below.

At our institution, we are currently practicing both early and standard declamping strategies during kidney resection. A survey performed asking centres performing renal surgery in Norway shows that indeed different declamping strategies are in use (unpublished data), so a well-designed study comparing these two methods could shed light on an issue under debate and might be practice changing regarding contemporary kidney surgery in Norway. It is our impression that early declamping can reduce WIT without increased bleeding. As far as we know, these clamping strategies have never been examined in a randomized study before. There are currently no definitive guidelines on different clamping strategy and though data suggest better outcomes with an early declamping strategy, there is a lack of high-level evidence to support this approach. In performing a randomized prospective study, we hope

to provide high-level evidence to fill this knowledge gap and help kidney surgeons in their decision making on clamping strategies in the future.

2. Trial Objectives

2.1. Primary endpoints and endpoint measures

- PROMS arm: To detect whether there is a difference in postoperative pain at 24 hours comparing t-RAPN to r-RAPN. The pain will be measured as a difference between baseline (before surgery) to pain measured the first post-operative day. The pain will be measured using the Brief Pain index (BPI) form and the variable used for calculation will be the average of items 3-6 in the form.
- Clamping arm: The primary endpoint is intraoperative bleeding during kidney resection comparing the two different clamping strategies. Potential differences in blood loss will be measured in ml bleeding comparing the two groups.

2.2. Secondary endpoints and endpoint measures

- To detect whether there is difference between the groups in opioid use during the first 24 hours after surgery. We will converse opioid use to morphine equivalents using table in attachment 5 in the protocol. Total opioids use the first 24 hours after the patient arrived in the recovery unit will be the variable used for analysis.
- To detect potential differences in pain between the groups at 6 weeks and one year after surgery. Potential differences will be measured as difference between baseline and follow up at 6 weeks or one year. For this endpoint, the average score of the BPI form (items 3-6 + 9-15) will be used.
- To detect potential differences in recovery between the groups at first post-operative day, 6 weeks and one year after surgery. Potential differences will be measured calculating the total score (0-150 points) of the Quality of Recovery 15-NO (QoR-NO) form. The score will be calculated as the difference between baseline and follow up at 1 POD, 6 weeks or one year.

- To detect potential differences in Quality of life (QoL) between the groups at 6 weeks and one year after surgery. Potential differences will be measured using the EORTC-QLQ-30 comparing baseline to 6 weeks or 1 year after surgery. The variables used for analysis will be the averages of the total score, but sub-analyses will also be performed for the different functional and symptom scales within the form
- To detect potential differences in sick leave between the groups at 6 weeks and one year after surgery. Sick leave will be calculated counting the total days of kidney surgery related sick leave from discharge to follow up at 6 weeks and 1 year.
- To detect potential differences between the groups in surgical margins, postoperative complications and bleeding, warm ischaemia time, operation time and length of stay. Warm ischaemia time and operation time will be measured in minutes. Complications will be measured and compared using the Clavien-Dindo scale (attachment 6) and bleeding will be measured in units transfusions given. Length of stay will be measured as days between admission and discharge.
- To detect potential differences in the relevant groups regarding recurrence free, disease specific and overall survival outcomes at 1,3- and 5-years follow-up.
- To detect potential differences in kidney function after 1,3- and 5-years follow-up. Potential differences will be measured comparing e-GFR comparing the e-GFR measured preoperatively to e-GFR at 1,3 and 5-years follow-up

3. Trial design

3.1. Overview of trial design and timelines

We intend to perform a study where we prospectively enrol patients scheduled for kidney surgery, both nephrectomies and kidney resections. The study has two arms – the aim of the first arm (the PROMS arm) is to evaluate if one surgical access is superior to another regarding pain, recovery and quality of life. The main aim of the other arm (the clamping arm) is to evaluate if an early declamping strategy during kidney resection can reduce WIT without causing significant increased bleeding or complications.

Since the target population, inclusion – and exclusion criteria and most of the follow-up is the same for both arms – we plan to perform this as one study with one ethical application and one informed consent form for each patient.

Potential candidates for the study will be identified at the MDT meeting where the cases are first discussed. The patient will then meet at the outpatient clinic, where the patient will be informed about the study. An initial assessment of inclusion – and exclusion criteria will then be considered. If the patient is a candidate for the study, and is interested in participation, written information about the study is given to the patient, and a screening visit is scheduled. In the screening visit, all inclusion - and exclusion criteria are considered again, and the patient has the possibility to ask questions about the study. If all criteria are met and the patient is willing to participate, written consent is signed, and the patient is formally included in the study. The medical history, demographics and performance status along with relevant blood tests and radiological data will be registered. The patient will at this visit be given the PROMS forms (BPI, QoR15-NO, QLQ – EORTC30) to bring home and fill in. These forms will constitute the baseline for the PROMS forms and will be handed over to study personnel at admission for surgery.

The indication for surgical access during kidney resection will be dependent on the anatomical placement of the tumour and surgeon preference. Therefore, we do not intend to initially randomize the patients to a specific treatment, but rather to follow both patient groups as two different cohorts. These cohorts are named cohort A (the patients scheduled for a transperitoneal approach – t-RARP) and cohort B (Patients scheduled for a retroperitoneal approach – r-RARP). In addition, we intend to include all other patients treated for renal cancer at our hospital and use these as a control group in the study. These patients will constitute the patients in cohort C – the control arm. The patients in arm C will be included as a control group in the PROMS study and will be used for analyses in the PROMS arm of the study but will not be included in the data analysis in the clamping arm of the study since no resections will be performed in these patients.

For the PROMS arm, we plan to use specific patient reported outcomes forms translated and validated into Norwegian. For pain measurements, we plan to use the Brief Pain Inventory (BPI, attachment 2 in protocol). The BPI was translated and validated in 2002 and has later been validated for use in Norwegian surgical patients [26, 27]. It has also previously been used

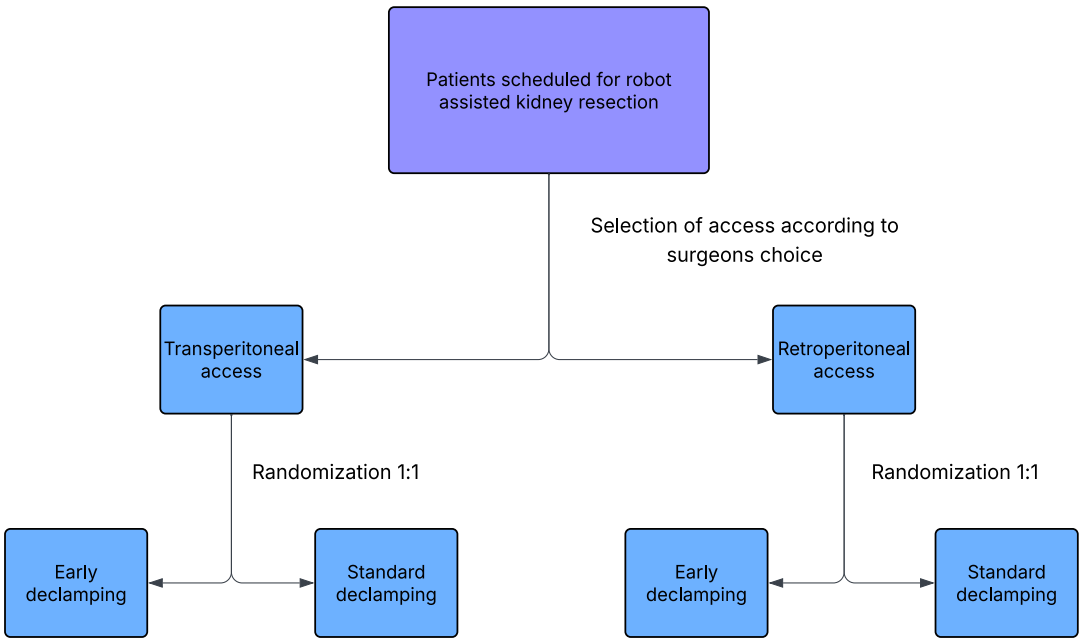
in a postoperative setting [28]. For assessment of recovery, we plan to use the Norwegian version of the Quality of recovery 15 (QoR-15NO) form. (attachment 3 in protocol). The form was translated and validated for Norwegian in a study on recovery after day surgery[29]. For quality of life, we plan to use the well-known Norwegian version of EORTC QLQ-C30. (attachment 4 in protocol). We plan to give these forms for the participants to fill in preoperatively at the inclusion visit, at the first day postoperatively, then at follow-up after 6 weeks and 1 year after surgery.

When the patient is admitted for surgery, the treating surgeon will inform the patient about the surgery and what can be expected post-operatively. The surgeon will then receive the PROMS forms the patient has filled in preoperatively.

3.2. Randomization in the declamping arm of the study

After the selection of surgical access is made by the surgeon, a stratified block randomization into early or standard declamping will be performed for both accesses. The selection and randomization process is illustrated in fig.1. This method will ensure an equal distribution of patients randomized to the two clamping strategies in both the r-RARP and the t-RARP group and ensure sufficient patient numbers to meet the requirements from the power analyses.

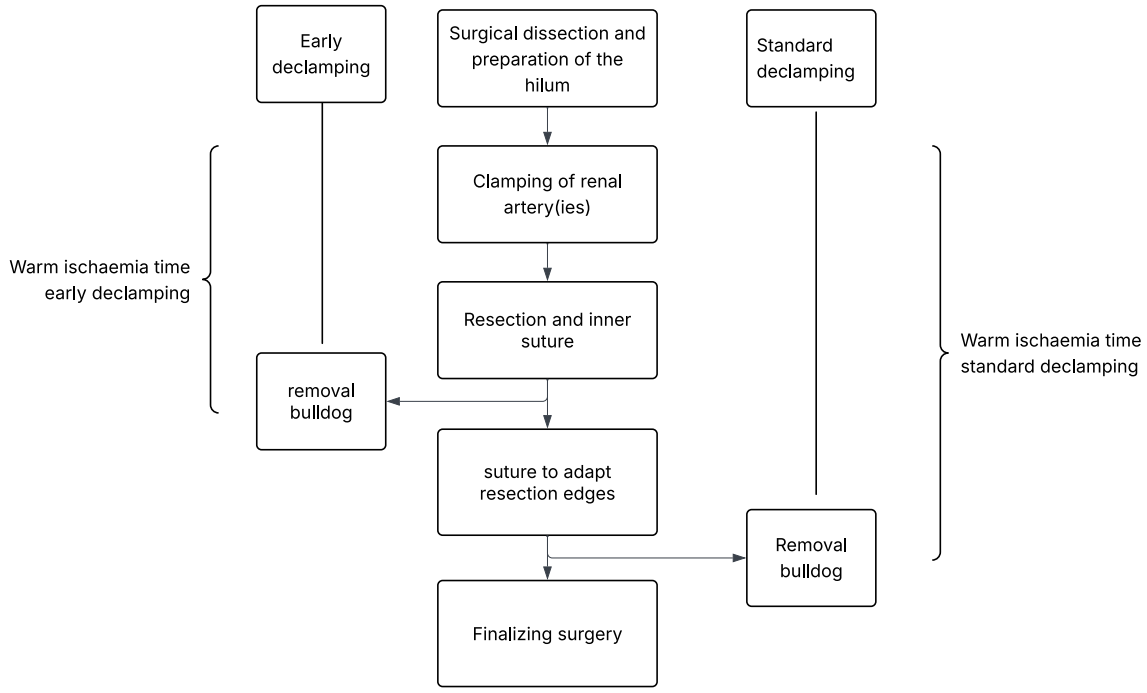
Figure 1. Illustration of the selection and randomization process for the different arms of the study. This design will ensure equal distribution of the declamping strategies for both surgical accesses.



After randomization, two boxes with numbered envelopes, one for each access, will be placed in the operating theatre. In the envelopes, there will be a sheet with either early or standard declamping written. The envelopes will be numbered so that the surgeon will pick the lowest number available from the correct box. Directly before surgery, the surgeon will pick the correct envelope according to access revealing if the patient will have an early or standard declamping during the resection. The surgery will then proceed as scheduled according to surgical access. If the patient is randomized to ***early*** declamping, the resection of the tumour will pursue as planned. The inner suturing of the resection surface is then performed before the bulldog clamp at the renal artery(ies) are removed. WIT is then recorded. After declamping, further suturing of the resection surface is possible before a suture to adapt the resection edges is performed.

If the patient is randomized to ***standard*** declamping strategy, the resection and suture of the resection surface is performed in the same way. In this group, the surgeon will now adapt the resection surface and complete all suturing *before* the bulldog clamp is removed. WIT is then recorded. The different declamping strategies are illustrated in figure 2.

Fig.2. Illustration of the different clamping strategies and their potential effect on warm ischaemia time.



Before closing the surgical wounds, all visible blood due to surgery will be suctioned from the patient. Immediately following surgery, the surgeon will manually measure the blood loss as ml bleeding. The surgeon will in the surgery report describe the declamping strategy used, the amount of bleeding, WIT and total surgery time used.

3.3. Post operative period

At the first post-operative day, the BPI and the QoR15-n forms will be given to the patient to fill in at the ward and deliver to study personnel at the latest at the day of discharge. At discharge, the patient will receive new PROMS forms (BPI, QoR-15-NO and EORTC30) to fill in the week before the six weeks follow-up.

We further intend to calculate total opioid use during the first 24 hours postoperatively starting from end of surgery and 24 hours forward. We will convert opioid use to morphine equivalents using table in attachment 5 in protocol. We as surgeons will prescribe a standardized postoperative opioid regimen for all patients to receive after surgery. We will in this way try to make the conditions for the patients as equal as possible, regardless of access or clamping strategy. For men, this will consist of 10mg oxycodone in the evening same day as surgery and

10mg oxycodone the morning after surgery, and for women 5mg oxycodone at the evening of surgery, and 5mg oxycodone the morning after surgery.

At the 6 weeks follow-up at the out-patient clinic, new blood samples will be taken and registered along with blood samples taken the first postoperative day. Potential complications will be recorded using the Clavien-Dindo scale (Attachment 6 in the protocol). Potential transfusions given post-operatively and length of stay (LOS) will be registered. Results from the pathology report will be described including tumour type, size and risk group. Potential early recurrences though unlikely, will also be registered. At this visit, the PROMS forms given at discharge will be collected.

We further intend to ask the patients about sick leave at the 6 weeks follow-up. At discharge from hospital, the default sick leave period for patients who need this, will be 2 weeks for patients with light work and 4 weeks for patients with strenuous physical work requiring heavy lifting etc. At follow-up at 6 weeks and 1 year, we will register this sick leave and potential additional sick leave the patient has received that can be related to the kidney surgery, added up to days in total.

At the 1-year visit, radiological and clinical data will be analysed with respect to potential recurrences and analysed regarding recurrence free, disease free and overall survival (RFS, DFS and OS). New blood samples will be taken and registered, and potential sick leave related to kidney surgery will be registered. At this visit, the patients will receive the PROMS forms (BPI, QoR-15-NO and EORTC30) for the last time, to fill in during or directly after the appointment and deliver to study personnel.

At the 3- and 5-year follow-up radiological data will again be considered regarding recurrences and relevant new blood samples will be taken and registered. Potential pathological verification of recurrences will also be recorded.

For a full and detailed description of variables gathered from the medical records and PROMS and scheduled visits in the study see attached complete variable list according to follow up and table 1 included in the protocol.

The study will be initiated at Haukeland University hospital but with the possibility of participation of other centres as we move forward with the study. Firstly, ethical approval will

be applied for, and after approval, we will consider seeking collaboration with hospitals performing both methods with a significant volume of patients. In case collaboration with other centres are sought later, an amendment to the protocol will be written and an approval of this amendment will be sought at the regional ethics committee.

3.4. Number of patients

For the PROMS arm, inclusion of patients is planned until we have at least 44 patients in both cohort A (t-RARP) and B (r-RARP), for details see power calculation in section 7.3. Since the selection of patients to trans – or retroperitoneal access is based on tumour location and surgical preference, it is likely that one group will be larger than the other at the end of inclusion. Based on access selection in our department the last 12 months, it is likely that cohort A will be larger than cohort B, and we estimate that this group will constitute 50-60 patients before the requirement of 44 patients in arm B is reached. All other patients scheduled for kidney surgery will be sought included in control arm C consecutively. Based on our experience, it is likely that this group will be smaller than the other two groups and will probably consist of 20-30 patients at end of inclusion. Based on these estimates we expect total patient numbers at end of inclusion to be 120 – 150 patients.

For the clamping arm, a a minimum of 88 patients are required according to the power calculation, see section 7.3. Since a stratified 1:1 randomization will be performed in both cohort A and cohort B, equal patient numbers in the two groups are ensured. At the end of inclusion for the PROMS study, the 88 patients patients necessary for the clamping study will be included.

In 2025, we did 73 robot assisted kidney resctions at HUS, and we estimate a patient accrual period of 2-3 years before end of inclusion. After that, a follow-up time of 5 years from end of inclusion is planned.

3.5. Randomization and stratification

The patients will be selected for trans or retro access at the surgeon’s discretion. Since no randomization will be performed at this point, some differences in the two groups will

inevitably result. Because of this a stratified randomization will be performed. The randomization process will be performed using google sheets.

4. Intervention

The patients included in the study will constitute the patient material for two arms of one study. For the first arm, the PROMS arm, the intervention is a kidney resection with a retro – or transperitoneal approach. The approach will be selected at the surgeon's discretion, and the patients will be included in two cohorts consecutively. The aim of this study is to assess whether one access is superior to the other regarding postoperative pain, recovery or quality of life. For the second arm, the clamping arm, the intervention is to compare early with standard declamping during kidney resection. The difference is described in detail in section 3.2. The hypothesis is that early declamping can reduce WIT without causing significant increased bleeding during resection or increased postoperative complications.

4.1. Target population

All patients scheduled for kidney resection or nephrectomy at Haukeland University Hospital.

4.2. Inclusion criteria

1. Signed written informed consent obtained prior to any study specific procedures
2. Patient must be willing and able to comply with the protocol
3. Age $\geq$18
4. Patients scheduled for robot-assisted partial kidney resection with either the trans- or retroperitoneal access
5. Other patients scheduled for surgery for kidney cancer, to be included as control group

4.3. Exclusion criteria

6. Previous kidney surgery on the affected side

7. Preexisting extensive intraabdominal adhesions preventing the use of the transabdominal access

8. Preexisting severe pain condition requiring regular use of opioids adding up to more than equivalent of 10mg po morphine daily

9. Any other physical or mental illness that according to the treating surgeon makes the patient unfit for inclusion in the study.

10. Confirmed metastatic renal cancer or any other metastatic cancer.

5. SCHEDULE OF ASSESSMENT AND PROCEDURES

5.1. Study procedures

The study specific procedures are outlined in table 1 below. This table is also included in attachment 1 in the protocol

	Scr[10]	Preop[11]	Surg[12]	1.POD[13]	6 wks	1 yr	3 yr	5 yr
Informed consent	x							
Medical history[1]	x							
Demographical data[2]	x							
ECOG	x							
Radiological data[3]	x					x	x	x
Blood samples[4]		x		x	x	x	x	x
Ischaemia time			x					
Surgery time			x					
Blood loss			x					
Opioid use				x				
Sick leave					x	x		
Length of stay					x			

Transfusions				x	x			
Pathological data[5]					x	(x)	(x)	(x)
Complications[6]					x	x		
Survival outcomes[7]					x	x	x	x
PROMS								
BPI[8]		x		x	x	x		
QoR-n[9]		x		x	x	x		
QLQ-EORTC30		x			x	x		

[1] Comorbidities, Charlson comorbidity index, height, weight,

[2] Gender, age

[3] Findings at CT thorax, abdomen with contrast. Tumour size, radiological stage, PADUA score

[4]eGFR, Hb

[5] Pathological classification, stage, grade (Fuhrman), size, presence of necrosis or sarcomatoid differentiation, (x) is registered if pathological verified recurrence

[6] Complications registered using the Clavien-Dindo classification. Complications grade 1-2 is minor complications, grade 3-5 major complications

[7] Recurrence free survival, disease specific survival and overall survival. Date of recurrence registered

[8]Brief pain index, attachment 2

[9]Quality of recovery, Norwegian version, attachment 3

[10]Screening

[11]Preoperatively, 1-3 days before surgery

[12] Day of surgery

[13] First post-operative day

5.2. Screening/baseline

At screening, informed consent is obtained. The medical history together with clinical and radiological data is obtained and registered. Relevant PROMS forms are handed out to the patient to be gathered by study personnel at admission to hospital prior to surgery.

5.3. Perioperative procedures

The day before surgery, the patients is informed about the surgery by the treating surgeon, baseline PROMS forms are gathered, and standard blood samples are taken. After surgery, the surgery report is filled in including the amount of bleeding, WIT and total surgery time. On the first post-operative day, the relevant PROMS forms are handed out to the patient to fill in. These are collected latest at discharge.

5.4. Follow-up procedures

At 6 weeks follow-up, relevant blood samples are gathered and the pathology report after surgery is registered. Relevant PROMs forms are gathered during this visit. Length of stay, potential complications, transfusions and sick leave and survival outcomes are registered. At 1, 3 and 5-years follow-up, relevant PROMs forms are registered, relevant blood samples are taken, radiological results and survival outcomes are registered.

6. Safety issues

6.1. Complications to surgery

All surgery related adverse events will be recorded in the surgery survey and will be handled according to normal practice. All complications will be registered according to the Clavien-Dindo classification (attachment 6). All potential transfusions will be registered. We plan to register complications at 6-weeks and 1 year follow-up.

6.2. Radiation of computed tomography (CT) scans

All CT-scans taken both preoperatively and after surgery will be according to standard practice at the department. No extra examinations with ionizing radiation will be performed in the study.

6.3. Criteria for withdrawal

All participants can withdraw from the study at any point without any reason. As the study after surgery is purely observational, no criteria for withdrawal set from investigator will be set.

7. Statistical considerations and analytical plan

7.1. Primary variables

The pain will be measured as a difference between baseline (before surgery) to pain measured the first post-operative day. The pain will be measured using the Brief Pain index (BPI) form and the variable used for calculation will be the average of items 3-6 in the form. We assume normal distribution of the data, and plan to compare the groups using Students t-test. I case of very skewed data, non-parametric tests such as the Mann- Whitney U-test can be performed. Regarding bleeding, the same assumption of normally distributed data is made, and analyses using Students t-test is planned.

7.2. Secondary variables

Statistical analysis regarding all secondary endpoints:

Regarding all the following continuous secondary variables, we assume normal distribution of the data, and plan to compare the groups using Students t-test. I case of very skewed data, non-parametric tests such as the Mann- Whitney U-test can be performed. For categorical variables, we plan to analyse the data using the Chi – square test. Potential differences in survival outcomes will be analysed using the Kaplan-Meier method. P-values < 0.05 will be considered statistically significant.

To detect whether there is difference between the groups in opioid use during the first 24 hours after surgery. We will converse opioid use to morphine equivalents using table in attachment 5 in protocol. Total opioids use the first 24 hours after the patient arrived in the recovery unit will be the variable used for analysis.

To detect potential differences in pain between the groups at 6 weeks and one year after surgery. Potential differences will be measured as difference between baseline and follow up at 6 weeks or one year. For this endpoint, the average score of the BPI form (items 3-6 + 9-15) will be used.

To detect potential differences in recovery between the groups at first post-operative day, 6 weeks and one year after surgery. Potential differences will be measured calculating the total score (0-150 points) of the Quality of Recovery 15-nor (QoR-NO) form. The score will be calculated as the difference will between baseline and follow up at 1 POD, 6 weeks or one year.

To detect potential differences in Quality of life (QoL) between the groups at 6 weeks and one year after surgery. Potential differences will be measured using the EORTC-QLQ-30 comparing baseline to 6 weeks or 1 year after surgery. The variables used for analysis will be the averages of the total score, but sub-analyses will also be performed for the different functional and symptom scales within the form.

To detect potential differences in sick leave between the groups at 6 weeks and one year after surgery. Sick leave will be calculated counting the total days of kidney surgery related sick leave from discharge to follow up at 6 weeks and 1 year.

To detect potential differences between the groups in positive surgical margins, postoperative complications, warm ischaemia time, operation time and length of stay. The potential positive surgical margin will be registered and analysed as a categorical variable and the length of the positive surgical margins will be registered in mm according to the pathology report. Potential postoperative complications will be registered using the Clavien-Dindo scale, attachment 6. Warm ischaemia and surgery time will be measured in minutes and length of stay in days.

To detect potential differences in recurrence and survival outcomes and kidney function after 5 years follow-up. Recurrence and survival outcomes will be measured as months from surgery to survival event or to the patient is censored from analysis due to end of follow up. Potential differences in kidney function will be registered in difference in eGFR comparing baseline to 5-year follow-up.

7.3. Sample size and power calculation

We have chosen pain at the first day postoperatively after surgery as the primary outcome of the study. The primary research question will be answered by calculating the mean change in the pain severity score, comparing preoperative status to the first day post-operatively. The pain severity score will be calculated as the average of the 4 main BPI pain items (items 3-6) in the form used. The mean change will be calculated and compared for the two groups. The hypothesis is that the patients treated with r-RAPN will experience less postoperative pain compared to the patients treated with t-RAPN. There is no defined consensus in the literature regarding the minimal clinical important difference (MCID) for pain [30-32]. Several studies have chosen 15mm at a 100 mm scale, equivalent to a difference in 1,5 points as a VAS scale as a sensible cutoff. Using this threshold, we come up with the following power calculation:

Using a two-sided t-test, a power of 90%, and a significance level (α) of 0.05, the required sample size was calculated as 38 participants per group (76 total) to detect a 15 mm difference. To account for potential dropout or loss to follow-up, an additional 15% was added, resulting in a final recruitment target of 44 participants per group, or 88 total.

☑ Summary with Dropout Consideration:

Parameter	Value
Effect size (Δ)	15 mm
Standard deviation (SD)	20 mm
Power	90%
Alpha	0.05 (two-tailed)
Required sample/group	38

Parameter	Value
Dropout adjustment (15%)	+6 per group
Final sample/group	44
Total sample size	88

Since no randomization to each treatment will be performed, we intend to include patients until we have 44 pateints in each group, potentially resulting in one group being larger than the other. We expect the control group (other patients surgically treated for kidney cancer) to consist of fewer patients at the end of inclusion. Since these are controls in the study and not part of the primary aims, the number of patients included in this group at end of inclusion will be registered and considered adequate.

Regarding the randomized arm of the study, a non-inferiority design is chosen. We hypothesize that an early declamping strategy will result in shorter WIT without causing significant increased bleeding or complication rates. We define the non-inferiority margin to be 75ml bleeding. We argue that an increased bleeding of less than 75ml using early declamping compared to standard declamping in not clinically relevant. Using the literature quoted in the introduction we estimate a median blood loss of 100ml with a standard deviation of 100ml. With 90% power and 15% dropout rate this results in a total sample size of 88 patients.

Sample Size Summary with Dropout Consideration

Parameter	Value
Outcome	Intraoperative blood loss (ml)
Expected median blood loss	100 ml
Standard deviation (SD)	100 ml

Parameter	Value
Non-inferiority margin (Δ)	75 ml
Power	90%
Alpha	0.025 (one-sided)
Required sample/group	38
Dropout adjustment (15%)	+6 per group
Final sample/group	44
Total sample size	88

8. Study duration

Since we do not plan to randomize the patients, we plan to include patients consecutively until we have at least 44 patients in each group, see power calculation. Depending on accrual rate we expect to reach this in 2-3 years after study start. After the necessary permissions have been granted, we plan to start inclusion during 2026. We plan for the inclusion period to last 2-3 years but wish to have a security margin in case inclusion takes longer than expected, so we seek permission to include patients until 31.12.2031. A late follow-up regarding recurrence, kidney function and survival outcomes are planned after 5 years follow-up, so we seek permission to keep registering data until 31.12.2036

9. Gathering and management of data

All data will be entered into a database. We use SPSS (IBM) version 30 (with possible upgrades to newer versions later). The database will be stored in a separate server approved by the local authorities (Helse vest IKT), dedicated for research data. All data will be stored and analysed without personal identifiers like name or social security number. The identification code between identity and participant number will be stored in a separate server area only accessible by the project leader and other authorized personnel.

10. Handling of biological material

We do not plan to gather biological material for translational research in this study. The only biological samples that will be taken, are blood samples taken for routine analyses.

11. Ethical aspects

11.1. Local regulations/declaration of Helsinki

The investigator will ensure that this study is conducted in full conformance with the principles of the "Declaration of Helsinki" or with the laws and regulations of the country in which the research is conducted, whichever affords the greater protection to the individual.

11.2. Informed consent

Written, informed consent will be gathered from all study participants. Potential candidates for the study will be identified at the MDT meeting where the cases are first discussed. The patient will then meet at the outpatient clinic, where the patient will be informed about the study. If the patient is a candidate for the study, and is interested in participation, written information about the study is given to the patient, and a screening visit is scheduled. In the screening visit, all inclusion - and exclusion criteria are considered again, and the patient has the possibility to ask questions about the study. If all criteria are met and the patient is willing to participate, written consent is signed, and the patient is formally included in the study.

12. Risks and benefits for the patients

- Regarding the PROMS arm of the study, the study is purely observational and there will be no particular medical risks for the patient. The patients will meet at an extra screening visit at the clinic, and they will be required to use some time to fill in the PROMS forms. We estimate that the patient will use 10-20 minutes on the forms each time, and since the forms is planned to be filled in a total of four times during the study period, a total time of 1-2 hours for the forms are estimated per patient.
- Regarding the clamping arm of the study, the patients will be randomized to one of two different declamping strategies. Both the arms have potential benefits and risks.

The patients randomized to early declamping will have the clamping bulldog removed before adaptation of the resection edges. This will probably reduce WIT and potentially prevent damage to the remaining renal tissue. However, it is possible that this strategy can cause increased bleeding during resection. Conversely, a standard declamping will probably increase WIT and potentially cause increased damage to the renal tissue, but it is probable that this declamping strategy will result in less bleeding during resection. According to existing literature, it is not likely that the difference in bleeding between the strategies are substantial enough to be clinically relevant. The cited cohort study from Japan [25], found a mean difference of 50ml bleeding between early and standard declamping, this is in accordance with our impression from using this method at our department.

13. Conditions for terminating the study

Since a randomized arm comparing two clamping strategies is planned – an interim analysis is planned halfway – when 22 patients have been included in both the early and standard declamping group. If the results of this interim analysis should show unexpected results indicating that one method is superior to the other by a wide margin, necessary measures will be discussed.

14. Study documentation, CRFs and record keeping

The Investigator must maintain adequate and accurate records to enable the conduct of the study to be fully documented.

The Investigator's Study File will contain the protocol/amendments, and case report forms, Independent Ethics Committee and governmental approval with correspondence, sample informed consent, staff curriculum vitae and authorization forms and other appropriate documents/correspondence etc.

Where source documents are required for the continued care of the patient, appropriate copies should be made for storing outside of the site.

Confidentiality of trial documents and patient records

The investigator must assure that the patients' anonymity will be maintained and that their identities are protected from unauthorized parties. On CRFs or other documents submitted to the sponsor, patients should not be identified by their names, but by an identification code. The investigator should keep a patient enrolment log showing codes, names and addresses. The investigator should maintain documents not for submission to the sponsor, e.g. patients' written consent forms, in strict confidence.

15. Publication of data

The results of this study will be published and presented at scientific meetings.

Since the study has two arms, at least two separate publications are planned.

When the results of this trial are published in a scientific journal, patients will not be possible to identify by name, picture, or any other identification. Pseudonomized data will be published. Positive, negative and inconclusive results will be published.

Authorships will be granted according to the Vancouver criteria.

16. Financing

Patient insurance is according to relevant national laws. The study implies no specific costs, and no financing of the study is regarded necessary.

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18. Attachments

18.1. Attachment 1 Study specific procedures

Detailed description of all study specific procedures according to time

	Scr[10]	Preop[11]	Surg[12]	1.POD[13]	6 wks	1 yr	3 yr	5 yr
Informed consent	x							
Medical history[1]	x							
Demographical data[2]	x							
ECOG	x							
Radiological data[3]	x					x	x	x
Blood samples[4]		x		x	x	x	x	x
Ischaemia time			x					
Surgery time			x					
Blood loss			x					
Opioid use				x				
Sick leave					x	x		
Length of stay					x			
Transfusions				x	x			
Pathological data[5]					x	(x)	(x)	(x)
Complications[6]					x	x		
Survival outcomes[7]					x	x	x	x
PROMS								
BPI[8]		x		x	x	x		
QoR-n[9]		x		x	x	x		
QLQ-EORTC30		x				x		

[1] Comorbidities, Charlson comorbidity index, height, weight,

[2] Gender, age

[3] Findings at CT thorax, abdomen with contrast. Tumour size, radiological stage, PADUA score

[4]eGFR, Hb

[5] Pathological classification, stage, grade (Fuhrman), size, presence of necrosis or sarcomatoid differentiation, (x) is registered if pathological verified recurrence

[6] Complications registered using the Clavien-Dindo classification. Complications grade 1-2 is minor complications, grade 3-5 major complications

[7] Recurrence free survival, disease specific survival and overall survival. Date of recurrence registered

[8]Brief pain index, attachment 2

[9]Quality of recovery, Norwegian version, attachment 3

[10]Screening

[11]Preoperatively, 1-3 days before surgery

[12] Day of surgery

[13] First post-operative day

18.2. Attachment 2 Norwegian version of Brief Pain index (BPI) form

Smerteregistrering hos kreftpasienter

Smerteskjema (BPI/1)

Fylles ut av pasienten 3 ganger ifm. sykehusopphold

Utfylt dato

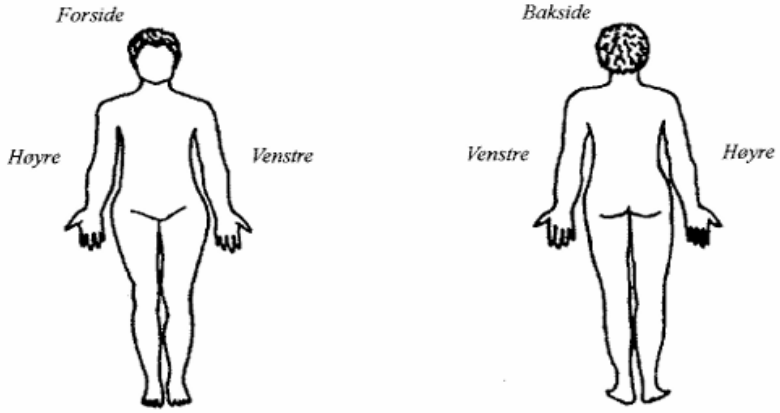
Pasientens navn

Skjemaet er utfylt ☐ **ved innleggelse** ☐ **ved utskrivning** ☐ **1 måned etter utskrivning**

Hvis *1 måned etter utskrivning* er fylt ut over, har du vært til kontroll hos din fastlege? ☐ **Ja** ☐ **Nei**

1. Gjennom livet har de fleste av oss hatt smerter (som lett hodepine, forstuelser eller tannpine). Har du i dag smerter av et annet slag enn slike dagligdagse smerter? ☐ **Ja** ☐ **Nei**

2. Skraver de områdene på kroppen hvor du har smerter. Marker med et kryss der du har mest vondt.



3. Vennligst sett ring rundt det tallet som best beskriver de sterkeste smertene du har hatt i løpet av de siste 24 timer.

0 1 2 3 4 5 6 7 8 9 10

Ingen smerter — *Verst tenkelige smerter*

4. Vennligst sett ring rundt det tallet som best beskriver de svakeste smertene du har hatt i løpet av de siste 24 timer.

0 1 2 3 4 5 6 7 8 9 10

Ingen smerter — *Verst tenkelige smerter*

5. Vennligst sett ring rundt det tallet som best angir hvor sterke smerter du har i gjennomsnitt.

0 1 2 3 4 5 6 7 8 9 10

Ingen smerter — *Verst tenkelige smerter*

6. Vennligst sett ring rundt det tallet som best angir hvor sterke smerter du har akkurat nå.

0 1 2 3 4 5 6 7 8 9 10

Ingen smerter — *Verst tenkelige smerter*

7. Hvilken behandling eller medisiner får du for å lindre smertene dine?

Vennligst snu arket!

Smerteregistrering hos kreftpasienter – Et pilotprosjekt i samarbeid mellom Tone Nordøy ved Kreftavdelingen på UNN og medisinstudent Trude Mortensen (epost trude@digitus.no – tlf 92205609)

Smerteregistrering hos kreftpasienter

Smerteskjema (BPI/2)

Fylles ut av pasienten 3 ganger ifm. sykehusopphold

8. I hvor stor grad har behandling eller medisiner lindret smertene dine de siste 24 timene?
Vennligst sett en ring rundt det prosenttallet som viser hvor stor smertelindring du har fått.

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Ingen lindring — *Fullstendig lindring*

Sett en ring rundt det tallet som for de siste 24 timene best beskriver hvor mye smertene har virket inn på:

9. Daglig aktivitet

0 1 2 3 4 5 6 7 8 9 10

Ikke påvirket — *Fullstendig påvirket*

10. Humør

0 1 2 3 4 5 6 7 8 9 10

Ikke påvirket — *Fullstendig påvirket*

11. Evne til å gå

0 1 2 3 4 5 6 7 8 9 10

Ikke påvirket — *Fullstendig påvirket*

12. Vanlig arbeid (gjelder både arbeid utenfor hjemmet og husarbeid)

0 1 2 3 4 5 6 7 8 9 10

Ikke påvirket — *Fullstendig påvirket*

13. Forhold til andre mennesker

0 1 2 3 4 5 6 7 8 9 10

Ikke påvirket — *Fullstendig påvirket*

14. Søvn

0 1 2 3 4 5 6 7 8 9 10

Ikke påvirket — *Fullstendig påvirket*

15. Livsglede

0 1 2 3 4 5 6 7 8 9 10

Ikke påvirket — *Fullstendig påvirket*

16. Hva er din hovedbekymring?

17. Kommentarer

Tusen takk for hjelpen!

Skjemaet er utfylt i samarbeid med ☐ **lege** ☐ **student** ☐ **sykepleier** ☐ **annen** ☐ **ingen**

Årsak hvis skjemaet ikke er utfylt

Smerteregistrering hos kreftpasienter – Et pilotprosjekt i samarbeid mellom Tone Nordøy ved Kreftavdelingen på UNN og medisinstudent Trude Mortensen (epost trude@digitus.no – tlf 92205609)

18.3. Attachment 3. Norwegian version Quality of recovery form (QoR-NO)

QoR-15NO

Dato: _ _ / _ _ / _ _ kl: _ _

Preoperativt ☐ Postoperativt ☐

DEL A

Hvordan har du følt deg det siste døgnet?

(på en skala fra 0 til 10, der 0 = ikke i det hele tatt [dårlig] og 10 = hele tiden [utmerket] Sett ring rundt tallet som stemmer for deg)

1.	Har kunnet puste lett	Ikke i det hele tatt 0 1 2 3 4 5 6 7 8 9 10 Hele tiden
2.	Har hatt matlyst	Ikke i det hele tatt 0 1 2 3 4 5 6 7 8 9 10 Hele tiden
3.	Har følt meg uthvilt	Ikke i det hele tatt 0 1 2 3 4 5 6 7 8 9 10 Hele tiden
4.	Har sovet godt	Ikke i det hele tatt 0 1 2 3 4 5 6 7 8 9 10 Hele tiden
5.	Har klart å ivareta personlig hygiene uten hjelp	Ikke i det hele tatt 0 1 2 3 4 5 6 7 8 9 10 Hele tiden
6.	Har klart å kommunisere med familie og/eller venner	Ikke i det hele tatt 0 1 2 3 4 5 6 7 8 9 10 Hele tiden
7.	Har fått støtte fra leger og sykepleiere på sykehuset	Ikke i det hele tatt 0 1 2 3 4 5 6 7 8 9 10 Hele tiden
8.	Kunne ha gjenopptatt arbeid eller vanlige gjøremål i	Ikke i det hele tatt 0 1 2 3 4 5 6 7 8 9 10 Hele tiden hjemmet
9.	Har følt meg vel og at jeg har kontroll	Ikke i det hele tatt 0 1 2 3 4 5 6 7 8 9 10 Hele tiden
10.	Har følt meg i fin form	Ikke i det hele tatt 0 1 2 3 4 5 6 7 8 9 10 Hele tiden

DEL B

Har du opplevd noe av det følgende det siste døgnet?

(på en skala fra 10 til 0, der 10 = ikke i det hele tatt [utmerket] og 0 = hele tiden [dårlig] Sett ring rundt tallet som stemmer for deg)

11.	Moderate smerter	Ikke i det hele tatt 10 9 8 7 6 5 4 3 2 1 0 Hele tiden
12.	Sterke smerter	Ikke i det hele tatt 10 9 8 7 6 5 4 3 2 1 0 Hele tiden
13.	Kvalme eller oppkast	Ikke i det hele tatt 10 9 8 7 6 5 4 3 2 1 0 Hele tiden
14.	Vært bekymret eller engstelig	Ikke i det hele tatt 10 9 8 7 6 5 4 3 2 1 0 Hele tiden
15.	Vært trist eller deprimert	Ikke i det hele tatt 10 9 8 7 6 5 4 3 2 1 0 Hele tiden

18.4. Attachment 4 Norwegian EORTC QLQ-C30 quality of life form

NASQ
EORTC QLQ-C30

Skjema nr. ☐☐

Pas.ID: ☐☐☐

Utfylt dato:

☐☐ . ☐☐ . ☐☐☐☐
Dag Måned År

Vi er interessert i forhold vedrørende deg og din helse. Vær så vennlig å besvare hvert spørsmål ved å sette et kryss x i den boksen som best beskriver din tilstand. Det er ingen «riktige» eller «gale» svar. Alle opplysningene vil bli behandlet konfidensielt.

	Ikke i det hele tatt	Litt	En del	Svært mye
1. Har du vanskeligheter med å utføre anstrengende aktiviteter, slik som å bære en tung handlekurv eller en koffert?	☐	☐	☐	☐
2. Har du vanskeligheter med å gå en lang tur?	☐	☐	☐	☐
3. Har du vanskeligheter med å gå en kort tur utendørs?	☐	☐	☐	☐
4. Er du nødt til å ligge til sengs eller sitte i en stol i løpet av dagen?	☐	☐	☐	☐
5. Trenger du hjelp til å spise, kle på deg, vaske deg eller gå på toalettet?	☐	☐	☐	☐

I løpet av den siste uka:	Ikke i det hele tatt	Litt	En del	Svært mye
6. Har du hatt redusert evne til å arbeide eller utføre andre daglige aktiviteter?	☐	☐	☐	☐
7. Har du hatt redusert evne til å utføre dine hobbyer eller andre fritidsaktiviteter?	☐	☐	☐	☐
8. Har du vært tung i pusten?	☐	☐	☐	☐
9. Har du hatt smerter?	☐	☐	☐	☐
10. Har du hatt behov for å hvile?	☐	☐	☐	☐
11. Har du hatt søvnproblemer?	☐	☐	☐	☐
12. Har du følt deg slapp?	☐	☐	☐	☐
13. Har du hatt dårlig matlyst?	☐	☐	☐	☐
14. Har du vært kvalm?	☐	☐	☐	☐

Bla om til neste side

Skjema nr. ☐☐ Pas.ID: ☐☐☐

I løpet av den siste uka:	Ikke i det hele tatt	Litt	En del	Svært mye
15. Har du kastet opp?	☐	☐	☐	☐
16. Har du hatt treg mage?	☐	☐	☐	☐
17. Har du hatt løs mage?	☐	☐	☐	☐
18. Har du følt deg trett?	☐	☐	☐	☐
19. Har smerter påvirket dine daglige aktiviteter?	☐	☐	☐	☐
20. Har du hatt problemer med å konsentrere deg, f.eks. med å lese en avis eller se på TV?	☐	☐	☐	☐
21. Har du følt deg anspent?	☐	☐	☐	☐
22. Har du vært engstelig?	☐	☐	☐	☐
23. Har du følt deg irritabel?	☐	☐	☐	☐
24. Har du følt deg deprimert?	☐	☐	☐	☐
25. Har du hatt problemer med å huske ting?	☐	☐	☐	☐
26. Har din fysiske tilstand eller medisinske behandling påvirket ditt familieliv?	☐	☐	☐	☐
27. Har din fysiske tilstand eller medisinske behandling påvirket dine sosiale aktiviteter?	☐	☐	☐	☐
28. Har din fysiske tilstand eller medisinske behandling gitt deg økonomiske problemer?	☐	☐	☐	☐

Som svar på de neste spørsmålene, sett et kryss i den boksen fra 1 til 7 som best beskriver din tilstand.

29. Hvordan har din helse vært i løpet av den siste uka?

☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7

Svært dårlig — Helt utmerket

30. Hvordan har livskvaliteten din vært i løpet av den siste uka?

☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7

Svært dårlig — Helt utmerket

61925

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18.5. Attachment 5 Conversion table for opioids

Ekvipotenstabell for opioider *(veiledende ratioer)*

Viktige momenter ved forskrivning av opioider:

- Morfin er førstevalg ved behov for et sterkt opioid. Tramadol er lite egnet til behandling av kreftsmerter, spesielt på grunn av bivirkninger.
- Ved alvorlig nyresvikt (eGFR < 30 mL/min) bør man vurdere opioidene fentanyl, buprenorfin eller metadon.
- Behovsdose for gjennombruddssmerte skal alltid være tilgjengelig for pasienten og bør være 1/6 - 1/10 av fast døgndose.
- Ved konvertering (rotasjon) mellom ulike opioider og/eller administrasjonsveier må det utøves forsiktighet og tett klinisk oppfølging. Legg den nye dosen minst 20 – 30 % lavere enn ekvianalgetisk dose, og eventuelt titrer videre opp til effekt.

Ved omregning fra ett opioid til et annet bør man alltid konvertere til morfin først. For eksempler, se motsatt side.

Peroralt (po) <-> peroralt (po)	Ratio
Morfin po : Kodein po	1 : 10
Morfin po : Tramadol po	1 : 10
Morfin po : Oksykodon po	1,5 : 1
Morfin po : Hydromorfon po	5 : 1 til 7,5 : 1
Morfin po : Metadon po	Se tabell (*)

Peroralt (po) <-> parenteralt (sc/iv)	Ratio
Morfin po : Morfin sc/iv	3 : 1
Oksykodon po : Oksykodon sc/iv	2 : 1
Hydromorfon po : Hydromorfon sc/iv	2 : 1

Parenteralt (sc/iv) <-> parenteralt (sc/iv)	Ratio
Morfin sc/iv : Oksykodon sc/iv	1 : 1
Morfin sc/iv : Hydromorfon sc/iv	5 : 1 til 7,5 : 1

Peroralt (po) <-> transdermalt (td)	Ratio
Morfin po : Fentanyl td	100 : 1 (**)
Morfin po : Buprenorfin td	75 : 1 (***)

** Morfin po mg/døgn	Fentanyl td mcg/time
30	12
60	25
90	37
120	50
150	62
180	75
240	100
300	125
360	150
420	175
480	200
540	225
600	250
660	275
720	300
960	400
1200	500

** Morfin po mg/døgn til fentanyl td mcg/t

*** Morfin po mg/døgn	Buprenorfin td mcg/time
9	5
18	10
36	20
54	30

*** Morfin po mg/døgn til buprenorfin td mcg/t

Dosering av metadon er en spesialistoppgave

Morfin po mg/døgn	Ratio Morfin po : Metadon po
30 - 89	5 : 1
90 - 299	6 : 1
300 - 599	8 : 1
600 - 999	10 : 1
≥ 1000	12 : 1

* Konverteringsratio for metadon

Oslo universitetssykehus

Seksjon for lindrende behandling, Avdeling for kreftbehandling

Trykket dato: 25.10.2018, eHåndbok-ID: 131551. Vær oppmerksom på at tabellen kan være endret etter utskrift. Det er alltid siste versjon i eHåndboken som er gjeldene.

Eksempler på konvertering *(tar ikke hensyn til anbefalt dosereduksjon ved rotasjon)*

Peroralt (po) <-> peroralt (po)	Ratio	Eksempler og kommentarer
Morfin po : Kodein po	1 : 10	**(a)** 3 mg Morfin po = 30 mg Kodein po = 1 Paralgin Forte po **(b)** 4 Paralgin Forte po = 120 mg Kodein po = 12 mg Morfin po
Morfin po : Tramadol po	1 : 10	**(a)** 5 mg Morfin po = 50 mg Tramadol po **(b)** Nobligan Retard 200 mg po = 20 mg Dolcontin po
Morfin po : Oksykodon po	1,5 : 1	**(a)** 15 mg Morfin po = 10 mg OxyNorm po **(b)** 60 mg OxyContin po = 90 mg Dolcontin po
Morfin po : Hydromorfon po	5 : 1 til 7,5 : 1	**(a)** 20 mg Dolcontin po = 4 mg Palladon Depot po (*basert på ratio 5 : 1*) **(b)** 30 mg Dolcontin po = 4 mg Palladon Depot po (*basert på ratio 7,5 : 1*)
Morfin po : Metadon po	Se tabell (*)	**(a)** 50 mg Morfin po = 10 mg Metadon po (*basert på ratio 5 : 1*) *Ratio avhenger av døgndose morfinekvivalenter. Dosering er en spesialistoppgave.*

Peroralt (po) <-> parenteralt (sc/iv)	Ratio	Eksempler og kommentarer
Morfin po : Morfin sc/iv	3 : 1	**(a)** 60 mg Morfin po = 20 mg Morfin sc/iv **(b)** 5 mg Morfin sc/iv = 15 mg Morfin po
Oksykodon po : Oksykodon sc/iv	2 : 1	**(a)** 80 mg OxyContin po = 40 mg OxyNorm sc/iv **(b)** 10 mg OxyNorm sc/iv = 20 mg OxyNorm po
Hydromorfon po : Hydromorfon sc/iv	2 : 1	**(a)** 16 mg Palladon po = 8 mg Palladon sc/iv **(b)** 2 mg Palladon sc/iv = 4 mg Palladon po

Parenteralt (sc/iv) <-> parenteralt (sc/iv)	Ratio	Eksempler og kommentarer
Morfin sc/iv : Oksykodon sc/iv	1 : 1	**(a)** 5 mg Morfin sc/iv = 5 mg OxyNorm sc/iv
Morfin sc/iv : Hydromorfon sc/iv	5 : 1 til 7,5 : 1	**(a)** 5 mg Morfin sc/iv = 1 mg Palladon sc/iv *(basert på ratio 5 : 1)* **(b)** 7,5 mg Morfin sc/iv = 1 mg Palladon sc/iv *(basert på ratio 7,5 : 1)*

Peroralt (po) <-> transdermalt (td)	Ratio	Eksempler og kommentarer
Morfin po : Fentanyl td	100 : 1 (**)	**(a)** 240 mg Morfin po/24 timer = 100 mcg Fentanyl td/time *(240 mg morfin po/24t = 10 mg morfin po/t = 0,1 mg fentanyl td/t = 100 mcg fentanyl td/t)*
Morfin po : Buprenorfin td	75 : 1 (***)	**(a)** 18 mg Morfin po/24 timer = 10 mcg Norspan td/time *(18 mg morfin po/24t = 0,75 mg morfin po/t = 0,01 mg buprenorfin td/t = 10 mcg buprenorfin td/t)*

18.6. Attachment 6. Clavien – Dindo table for registering of surgical complications

Grade	
1	Any deviation from the normal postoperative course without the need for pharmacological treatment or surgical, endoscopic and radiological interventions. Acceptable therapeutic regimens are: drugs as antiemetics, antipyretics, analgetics, diuretics and electrolytes and physiotherapy. This grade also includes wound infections opened at the bedside.
2	Requiring pharmacological treatment with drugs other than such allowed for grade I complications. Blood transfusions, antibiotics and total parenteral nutrition are also included.
3	Requiring surgical, endoscopic or radiological intervention
3a	Intervention under regional/local anesthesia
3b	Intervention under general anesthesia
4	Life-threatening complication requiring intensive care/intensive care unit management
4a	Single organ dysfunction
4b	Multi-organ dysfunction
5	Patient demise