Evaluating the Role of SURGical TElementoring in Acquisition of Surgical Skills of Laparoscopic CHolecystectomy (SURGTEACH). Protocol for a Pilot Randomized Controlled Trial.

Khayam But, Knut-Magne Augestad, Bjørn von Gohren Edwin, Gunnar Hartvigsen, Ole Sjo

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Khayam But[1] MD; Knut-Magne Augestad[2] Prof Dr Med; Bjørn von Gohren Edwin[3] MD, Prof Dr Med; Gunnar Hartvigsen[4] Prof Dr; Ole Sjo[5] MD, PhD

[1] Nordland Hospital Trust Bodø NO
[2]Department of surgery Akershus University Hospital Lillestrøm NO
[3]The intervention center Medical Faculty Oslo University Hospital Oslo NO
[4] UiT The Arctic University of Norway Tromsø NO
[5] Oslo University Hospital Oslo NO

Corresponding Author:
Knut-Magne Augestad Prof Dr Med
Department of surgery
Akershus University Hospital
Sykehusveien 25, 1478 Nordbyhagen
Lillestrøm
NO

Abstract

Background: Developing surgical skills among residents requires time and resources, often in conflict with the goals of efficiency and hospital economics in surgical practice. It is necessary to optimize resident training to prevent a decline in quality. Skilled surgeons are vital for effective and safe performance, yet the training path for surgical residents is often inefficient, especially in the minimally invasive surgery era.
Establishing a framework that efficiently disseminates surgical skills is essential to cultivate skilled future surgeons within an acceptable timeframe. Surgical telementoring (ST) aligns well with minimally invasive surgery since the operating mentee shares the same perspective of the operating field as the telementor. Despite growing experience with telemedicine, data on educational outcomes is still under evaluation.

Objective: The efficiency and safety of ST as a skill development tool will be evaluated for selected residents performing laparoscopic cholecystectomy (LC). Technical and non-technical surgical skills of included surgical registrars will be evaluated in addition to the satisfaction scores of patients, registrars, and mentors.

Methods: In this pilot randomized controlled trial (RCT), eligible residents will be assigned in a 1:1 ratio to either the intervention group (real-time ST and postoperative coaching) or the control group (traditional intraoperative hands-on teaching). This research adheres to the extended CONSORT statements for pilot RCTs and follows the intention-to-treat principle (ITT).
The residents in both groups will perform five consecutive procedures under standardized intraoperative conditions. The primary outcomes are the global assessment tool for evaluating Laparoscopic Skills (GOALS-score) and a score assessing non-technical surgical skills (NOTSS-score). We hypothesize skill enhancement in the intervention group by 3–5 points on the GOALS score compared to the control group.
Secondary outcomes will be satisfaction scores of patients, included registrars and mentors in both groups.
For the definite RCT to attain 0.8 statistical power, a p-value of less than 0.05, and a 20% dropout rate, 12 residents per group are needed. However, the trial's novelty requires a pilot study to clarify the premises of a future definite RCT.

Results: Before the trial begins, all telementors and on-site consulting surgeons will participate in a LapCo TT course (LapCo train the trainer course). The configuration of the telementoring system was finalized in December 2023. All residents, consulting surgeons, and telementors were instructed on how to set up and use the telementoring system.
The recruitment commenced in spring 2024. Due to licensing issues, the MedPrescence equipment was replaced by Proximie in the summer of 2025 after the recruitment of 4 residents in the study. The telementors underwent a course for acquaintance with the new telementoring software system before the remaining inclusions commenced in August 2025, scheduled for three months.

This will enable data analysis in the fall of 2025, and findings should be submitted for publication in an international peer-reviewed journal by spring 2026.

Conclusions: The SURGTEACH trial is the first known trial that evaluates surgical telementoring as an educational method in a pilot-RCT assessing both technical and nontechnical surgical skills. Globally and domestically, there are constraints on the number of surgeons available and a strain on the surgical education system. The Norwegian healthcare system needs help adequately training enough surgeons, mainly due to geographical obstacles and limitations in the educational system. Therefore, there is a need for a fundamental change in surgical education, and surgical telementoring has the potential to overcome these obstacles. This study has the potential to provide substantial evidence that may be used to enhance surgical education, particularly in rural healthcare facilities. Clinical Trial: Trial registration: ClinicalTrial.gov NCT06421584

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Original Manuscript

Evaluating the Role of SURGical TElementoring in Acquisition of Surgical Skills of Laparoscopic Cholecystectomy (SURGTEACH). Protocol for a Pilot Randomized Controlled Trial.

Khayam Butt [1], MD; Laurent Olivier Trichet [2], MSc, PhD; Gunnar Hartvigsen [3], MSc, PhD; Ole Sjo [4], MD, PhD; Bjørn Edwin [5], MD, PhD; Knut Magne Augestad [6], MD, PhD.

[1] Department of Gastrointestinal Surgery, Nordlandssykehuset Bodø, Bodø, Norway
[2]Department of Research and Statistics, Nordlandssykehuset Bodø, Bodø, Norway
[3] Department of Computer Science, University of the Artic, Tromsø, Norway
[4] Department of Gastrointestinal Surgery, Ullevål University Hospital, Oslo, Norway
[5]Department of HPB Surgery, Oslo University Hospital, Oslo, Norway
[6] Department of Gastrointestinal Surgery, Akershus University Hospital, Lørenskog, Norway.

Corresponding Author:
Khayam Butt, MD
Department of Gastrointestinal Surgery
Nordlandssykehuset Bodø
Parkveien 95
8005 Bodø
Phone: +47 995 60 985
Email : Khayam.Ashraf.Butt@nordlandssykehuset.no

Keywords :
Interprofessional education, competency-based education, videoconferencing, surgical education, laparoscopic cholecystectomy, pilot randomized controlled trial.

Abstract

Background:

Developing surgical skills among residents requires time and resources, often in conflict with the goals of efficiency and hospital economics in surgical practice. It is necessary to optimize resident training to prevent a decline in quality. Skilled surgeons are vital for effective and safe performance, yet the training path for surgical residents is often inefficient, especially in the minimally invasive surgery era. Establishing a framework that efficiently disseminates surgical skills is essential to cultivate skilled future surgeons within an acceptable timeframe. Surgical telementoring (ST) aligns well with minimally invasive surgery since the operating mentee shares the same perspective of the operating field as the telementor. Despite growing experience with telemedicine, data on educational outcomes is still under evaluation.

Objective:

The efficiency and safety of ST as a skill development tool will be evaluated in selected residents performing laparoscopic cholecystectomy (LC). In this pilot randomized controlled trial (RCT), eligible residents will be assigned in a 1:1 ratio to either the intervention group (real-time ST and postoperative coaching) or the control group (traditional intraoperative hands-on teaching). This research adheres to the extended CONSORT statements for pilot RCTs and follows the intention-to-treat principle (ITT).

The residents in both groups will perform five consecutive procedures under standardized intraoperative conditions. The primary outcomes are the global assessment tool for evaluating Laparoscopic Skills (GOALS-score) and a score assessing non-technical surgical skills (NOTSS-score). We hypothesize skill enhancement in the intervention group by 3–5 points on the GOALS score compared to the control group.

For the definite RCT to attain 0.8 statistical power, a p-value of less than 0.05, and a 20% dropout rate, 12 residents per group are needed. However, the trial's novelty requires a pilot study to clarify the premises of a future definite RCT.

We present a pilot RCT involving five residents per group. We will report on challenges faced during the trial and suggest amendments to assess the need for a future definitive RCT.

Results:

The primary outcomes will be technical and non-technical surgical skills.

Patient-reported experience measures (PREMs) and satisfaction scores of eligible mentees and mentors will be analyzed as secondary outcomes.

Conclusions:

The SURGTEACH trial is the first clinical study piloting a randomized trial evaluating ST for educational outcomes. This research may provide high-quality evidence to improve surgical

education, especially in rural hospitals.

Trial registration: ClinicalTrial.gov NCT06421584

Introduction

Developing surgical skills among residents is a time- and resource-consuming process (1). Increasing demands of efficiency and hospital economy in surgical practice have contributed to the decreasing number of surgeons per capita (2). Concerning reports show increasingly limited access to the operating room (OR) during a surgical resident's educational path (3).

Efficient training trajectories for general surgeons are needed to ensure educational quality and efficiency (4).

Geographical challenges with long distances and harsh weather conditions in a Northern Norwegian setting require complicated transport measures to reach the hospital. A healthcare policy with rurally located institutions providing basic surgical care within acceptable proximity to the patients has been established (5). These institutions, however, possess limited access to surgical expertise, which may contribute to the hampered quality of OR resident training. The Norwegian National Medical Association has already taken this fact into account. This is one of the leading reasons for the reduced number of surgical procedures required in the Norwegian national requirements for achieving specialty in general- and colorectal surgery.

LC is a technically challenging procedure that residents get acquainted with early under supervision. Potential complications may pose serious hazardous consequences for the patient in case of major bile duct injury. Substantial hands-on supervision in initial phases of the learning curve (LC) with gradual achievement of independence is expected.

Laparoscopic surgical procedures have a complex LC, affecting clinical and financial outcomes (6). However, expertise in laparoscopic surgery is not readily available, constituting a challenge in training of residents specifically in smaller hospitals with limited volume of surgical procedures. The mentioned aspects call for optimizing the training period of surgical residents. There is some evidence for the cost-effectiveness and safety of telementoring systems (7).

Despite technological advances over recent time and mounting experience with telecommunication and telementoring in the health sector, there still is insufficient data for educational outcomes (8-10).

To our knowledge, no randomized controlled trial has evaluated the educational benefits of ST. We

aim to conduct a pilot RCT to collect data assessing amendments and necessity for a future full-scale RCT.

Methods

This study is a parallel, 2-group, assessor-blind, multicenter, pilot RCT.

Participating surgical residents are allocated in a 1:1 ratio to the intervention group, receiving real-time intraoperative telementoring and postoperative coaching, or to the control group receiving traditional intraoperative mentoring. The intention-to-treat (ITT) principle will be applied. The study adheres to the CONSORT and SPIRIT 2013 Statements.

Setting and study design

The Northern Norwegian Health Care Trust consists of 11 hospitals, consisting of one University hospital and ten local hospitals. Two of these local hospitals, Sandnessjøen and Mo I Rana, will be study sites. Both locations have surgical residency training programs teaching laparoscopic cholecystectomy.

Inclusion criteria:

Residents

- General surgery residents in years 1 to 6 of their specialty education having partially or completely performed more than 10 laparoscopic procedures.
- Stratification according to experience.
- Having passed the prerequisite mandatory national course of general laparoscopic principles and the mandatory laparoscopic cholecystectomy course.
- Agreement with the mentor about the communication model during surgery. This model is derived from LapcoNor principles (11). Residents in the intervention group underwent an additional introduction to the principles of communication through telementoring at the OR. They were also introduced to the telementoring equipment.

Mentors

- Consultant surgeon with more than 5 years of experience with independently performing laparoscopic cholecystectomies.
- Having acquaintance with the assessment of videos for GOALS-score (12).
- Both telementors and on-site mentors had to attend the national LapCo-Nor “train the trainer” course and followed standardized communication norms with the mentee during surgical

mentoring thus diminishing bias of communicative difference.

Patients

- Gallstone disease without clinical history of cholecystitis
- BMI < 38
- No previous history of upper abdominal laparotomy
- No previous history of percutaneous gallbladder drainage
- Patient provided informed consent.

Interventions

The residents will be randomized into two groups. The control group will follow traditional OR-supervision in all consecutive procedures with onsite mentoring by an experienced surgeon. The intervention group will receive guidance from a distantly located telementor. A skilled surgeon will attend all procedures in the intervention group in case of unexpected events during surgery needing onsite assistance. Secondly, the residents will receive postoperative coaching according to the Lapco TT principles and the GROW model (13). The mentors and mentees will sign a contract accepting the educational setting and the prerequisites before participating in the trial.

Coaching: The GROW model

The GROW-model was used as a coaching modality in training all included residents. This goal-oriented coaching model guides a coaching conversation through 4 stages:

1. Goals – focuses on specific targets that the resident wishes to achieve.
2. Reality – explores the true nature of the problem (performance review)
3. Options – formulation of effective solutions, particularly to the issues that prevent the resident from achieving their goals.
4. Wrap-up – develops an action plan for the candidates to move toward their originally stated goals and examines potential obstacles and implementation strategy to overcome them.

Each telementoring procedure will be followed by a coaching session asking the mentee to describe his/her performance (opportunity for self-reflection). Performance enhancing feedback will be provided by the telementor, attempting to formulate a take-home message. Both the GROW model and the Lapco TT model for postoperative coaching will be used.

Lapco TT principles of intraoperative communication

All telementoring sessions will follow the learner-focused framework described by McKenzie et al. (14). The principles of the intraoperative communication are:

1. Stop word: the trainer prompts the trainee to stop the procedure.
2. Identify: The trainer asks the trainee to identify the problem
3. Explain: Trainee informs the trainer about the problem
4. Instruct: trainer informs the trainee what needs to be done to proceed
5. Check: trainer check the trainees understanding and the next step to action
6. Judge: trainer judges the capability of the trainee to proceed

The surgical procedure

The laparoscopic cholecystectomy procedure will be standardized with a stepwise approach using the principles of creating the critical view of safety (CVS) before transecting any structure in the Calot's triangle (15, 16). All included residents will be instructed in intraoperative communication according to LapCo and GROW principles. The stepwise procedure description will be provided for both mentees and mentors and adherence will be required.

The technical setup of the telementoring system

Both hospitals, including patients for the study have implemented surgical telementoring systems in the operating rooms. MedPrescence© provides a telementoring system that utilizes voice instruction via headphones to assist the mentee throughout the laparoscopic surgery. At the same time, the telementor observes the procedure in real-time through a live stream. Telestration may be used to provide annotations on a static picture of the ongoing surgical procedure. The telestration session begins when the telementor instructs the mentee to cease surgery and directs their attention to the visual aspect. Telementors may demonstrate surgical planes and strategize dissection. The telementor may alternate between the external camera, providing an overview of the laparoscopic trocars and the spatial position of the OR- and anesthesia nurse, and the laparoscopic camera. The system captures audio from the mentor-mentee dialogue and footage from the laparoscopic surgery and external cameras.

Figure X shows the OR-setup during the telementored sessions.

Outcomes

Primary outcomes

The primary outcomes are the GOALS- and NOTSS scores (Figure 1, 2). The GOALS score is the only global rating scale developed and validated for assessing laparoscopic surgery. Five subscales are assessed: depth perception, bimanual dexterity, efficiency, tissue handling, and autonomy. Each subscale is scored from 1 to 5, giving a maximum score of 25 when assessing laparoscopic technical skills of the resident. The NOTSS score assesses the non-technical surgical skills of the operating surgeon by evaluating defined parameters (17)

The NOTSS score will be obtained from video recording the interactions between the operating telementee and the rest of the OR team . An evaluating group of 3 specialized OR-nurses is established for NOTSS score assessment of each procedure by viewing the video footage of the room camera.

The GOALS score assessment will be obtained by video recording the laparoscopic camera footages of each of the procedures conducted by the included registrars. An evaluating group of 3 expert laparoscopic surgeons is established for GOALS score assessment of each procedure by viewing the video footage of the laparoscopic camera, including the verbal communication between the mentee and the mentor.

Both evaluating groups were presented with the video footages for each included mentee in a randomized fashion to obtain a blinded evaluation of the GOALS and NOTSS scores.

Secondary outcome measurements

Satisfaction of surgical residents and mentors

Residents in both groups were presented with a satisfaction score scheme after each procedure, providing a self-assessed satisfaction score of the learning outcome.

The satisfaction survey was based on a 5-point Likert scale with 1=strong disagreement with the statement and 5=strong agreement with the statement. A similar satisfaction survey was applied for the mentors in each group.

Patient-related outcomes and complications

All preoperative, operative, and postoperative patient data will be collected. The videos were evaluated for minor intraoperative complications such as bleeding and gallbladder perforation, and how these were handled. Major intraoperative complications such as common hepatic, bile

duct and bowl injury were noted for each procedure. Interventions by the attending consultant surgeon were noted. Conversion to laparotomy is also assessed. Recorded complications will be scored according to Clavien-Dindo Classification of Surgical Complications (18).

Figure 1. Global Operative Assessment of Laparoscopic Skills (GOALS)

Figure 2. NOTSS scoring scale (non-technical surgical skills)
The 4 assessed categories are each scored from 1 to 4. Each category contains 3 elements, each of which is scored from 1-4.

Figure 3. Resident satisfaction survey. The satisfaction survey was based on a 5-point Likert scale with 1=strong disagreement with the statement and 5=strong agreement with the statement.

Figure 4. Telementor satisfaction survey.
The satisfaction survey was based on a 5-point Likert scale with 1=strong disagreement with the statement and 5=strong agreement with the statement.

Participant timeline

The trial design is summarized according to the CONSORT flow chart in figure 5. The timeline showing the inclusion of surgical residents in both groups is shown. The consented residents for inclusion will be informed about the randomization 1 week before the planned procedures and standardized information concerning communication during the telementoring procedure in addition to the planned stepwise procedure description will be provided.

Figure 5. Design of the SURGTEACH Trial: CONSORT Flow and Participant Timeline. The intention to treat (ITT) principle will be applied.

Sample size

This pilot RCT is designed to investigate challenges and unforeseen pitfalls in conducting a proper RCT. Given the novelty of the theme and the resources needed for an RCT it seems necessary to conduct a piloting study to investigate the necessity for a proper RCT.

This piloting study is designed as a superiority trial to demonstrate the superiority of telementored resident skill acquisition in the operating room (OR) compared to standard training methods. Previous investigations have shown that the standard deviation of the GOALS score is 2.5. Our hypothesis posits that the intervention group will exhibit a significant clinical improvement in their skills, as measured by a 3–5-point rise in the GOALS score, compared to the control group. To achieve a statistical power of 0.8, a significance level (p-value) of less than 0.05, and accounting for an expected dropout rate of 20%, it is necessary to enroll 12 residents per group for an RCT,

This piloting study will include five residents in the experimental and the control arm. The included residents will be stratified into two groups based on the number of previously performed laparoscopic cholecystectomy procedures.

Recruitment

Recruitment of research participants (surgical residents) will primarily occur at their local hospitals. During 2024 and 2025, individuals diagnosed with gallstone disease and booked for laparoscopic cholecystectomy will be included as patients. Study residents will be scheduled for 5 laparoscopic cholecystectomies within 3 days. If not able to attract enough residents at the local hospitals, the recruitment efforts were extended to include residents from other hospitals.

Allocation and blinding

The randomization process will use a predetermined statistical sequence by an external researcher who was not directly engaged in the study. All individuals actively participating in the experiment will be given access to the allocation codes after randomization. Computer-generated stratification is used for randomization to create balanced and unpredictable groups. To ensure balance across groups

concerning significant confounders, the randomization process will be stratified based on the trainees' experience, explicitly distinguishing between those who had performed 5-10 laparoscopic cholecystectomies and those who had performed 10-20.

Blinding the trainees is not possible due to the characteristics of the intervention. Nevertheless, the evaluators who assessed performance needed to be aware of the assignment of individuals to specific groups. All instances of unintentional unmasking will be documented.

Data management and collection methods

Each video record will be saved on the recording system in the OR. The video records will be edited by KB (corresponding author) into predefined parts of the surgical procedure as defined in the stepwise procedure description and annotated in the edited video records. These standardized edited records will be anonymized and randomized for each resident, and distributed to the evaluating group for GOALS and NOTSS score assessment.

The project secretary will provide each evaluating group with a Questback questionnaire for collection of their assessments. The assessments will subsequently be collected and decoded by the project secretary possessing the anonymization and randomization key.

The results will be collected by Surveymonkey© and uploaded to a secure server. Data items (resident satisfaction, mentor satisfaction) were collected immediately after each procedure.

GOALS scores and NOTSS scores will be collected by giving the mentor group a time frame of 1 moth to assess the videorecords. Patient-related data will be collected retrospectively by assessing the electronic health record. The timeline of data collection is shown in Figure 6.

Figure 6. Trial data collection

Statistical methods

The t-test will be applied to compare the mean GOALS scores between the intervention and control groups. Paired t-tests will compare each group's initial and final performance. The impact of telementoring on the GOALS score will be evaluated using multivariate analysis while considering the initial GOALS score. The data will be presented as the mean with the standard deviation. The demographic data and interquartile range (IQR) will be presented as medians. A p-value of 0.05 is deemed statistically significant.

Data monitoring

Data and study monitoring will be performed after 10 residents are recruited in the trial. Monitoring

will be performed by the principle investigator, the telementors and on-site consultant surgeon in a separate meeting. Technical issues of telementoring, mentoring framework and coaching will be addressed. Due to the novelty of the study, adjustments of the telementoring framework may be necessary.

Ethics and dissemination

The study was approved by the ethical committee (REK HELSE NORD 32592) and the data protection officer (PVO) at Nordlandssykehuset Bodø.

Surgical residents will be informed that their participation is entirely optional, that there will be no repercussions if they choose to withdraw, and that they can withdraw without providing a reason. Upon signing in, all surgical residents must sign an electronic permission document and a mentee-mentor contract (intervention arm). Participation in the research does not include any pay.

Patients will be asked for informed consent. The study group cannot see any ethical implications for patient participation, as the telementoring (intervention arm) will provide increased surgical expertise in the OR.

Results

Before the trial begins, all telementors and on-site consulting surgeons will participate in a LapCo TT course (LapCo train the trainer course). The configuration of the telementoring system was finalized in December 2023. All residents, consulting surgeons, and telementors were instructed on how to set up and use the telementoring system.

The recruitment of surgical residents will start after the evaluation and acceptance of this research protocol for publication to accommodate any required modifications before the initiation of the study. The protocol is now in its latest version as of May 9th, 2024. The final version will be designated as 1.0.

The recruitment commenced in spring 2024. Due to licensing issues the MedPrescence equipment was replaced by Proximie in summer 2025 after recruitment of 4 residents in the study. The telementors underwent a course for acquaintance with the new telementoring software system before the remaining inclusions commenced in August 2025 scheduled for three moths. This will enable data analysis in the fall of 2025, and findings should be submitted for publication in an international peer-reviewed journal by spring 2026.

Discussion

Surgical training develops theoretical and practical skills during education throughout the trainee's learning time. The rate at which skilled surgical professionals are produced is not sufficient. There is a need for ongoing quality improvement in surgical education. The COVID-19 epidemic has underscored the need for improved surgical education and collaboration among surgeons, given the high benchmarks of surgical treatment. The limitations on travel and in-person training in the surgical disciplines have emphasized the need for more efficient approaches to sharing information and skills among surgical professionals. This is crucial to deliver broader and higher-quality surgical care for patients. This is particularly problematic in regions with high population density and disparities in the skill levels of surgical healthcare practitioners.

Telecommunication technology has significantly influenced hospital services in recent years and is increasingly used in operating rooms. Telementoring has been evaluated as a dependable and practical approach for distributing surgical information and therapy. Significant advancements have occurred in communications, providing healthcare practitioners with technologies that may be used in clinical practice. Using communications technology in clinical practice has also raised concerns about patient data security and risk management. Although there have been advancements in this field, more rigorous studies that demonstrate the effectiveness of telementoring and telecommunication in surgical education still need to be conducted. Additionally, surgical telementoring has yet to be widely adopted.

Every study, including the one outlined in this protocol, inevitably has limitations. Utilizing an innovative research design and being at the forefront of technological integration in the operating room, the primary anticipated constraint is that the telementoring group will be compared to a control group (which receives traditional hands-on training) using a standardized training approach and a solid mentor-mentee relationship. Introducing a distant telementor may create a stressful time in the teaching process. Another constraint pertains to the computations of sample size. This randomized controlled trial has been planned as a superiority study, hypothesizing that the intervention group would substantially improve their surgical abilities. There are ambiguities in this hypothesis, but they are inevitable owing to the trial's novelty. Finally, technological constraints may be present since it is recognized that surgical telementoring is linked to challenges in communication proficiency during surgical procedures. Nevertheless, the use of the LapCo TT principles for intraoperative communication may prevent this issue.

Conclusion

The SURGTEACH trial is the first known trial that evaluates surgical telementoring as an

educational method in a piloting randomized manner. Globally and domestically, there are constraints on the number of surgeons available and a strain on the surgical education system. The Norwegian healthcare system needs help adequately training enough surgeons, mainly due to geographical obstacles and limitations in the educational system. Therefore, there is a need for a fundamental change in surgical education, and surgical telementoring has the potential to overcome these obstacles. This study has the potential to provide substantial evidence that may be used to enhance surgical education, particularly in rural healthcare facilities.

Acknowledgements

Olympus Norway has supported the study with the installation and configuration of the telementoring system at Sandnessjøen, Mo I Rana and Stokmarknes local hospitals.

Proximie has also supported the study by providing the Cloud solution enabling the last part of the inclusions to the study.

Conflicts of Interest

The authors declare that they have no conflict of interest.

Appendix 1

SPIRIT checklist

Appendix 2

The stepwise approach for laparoscopic cholecystectomies.

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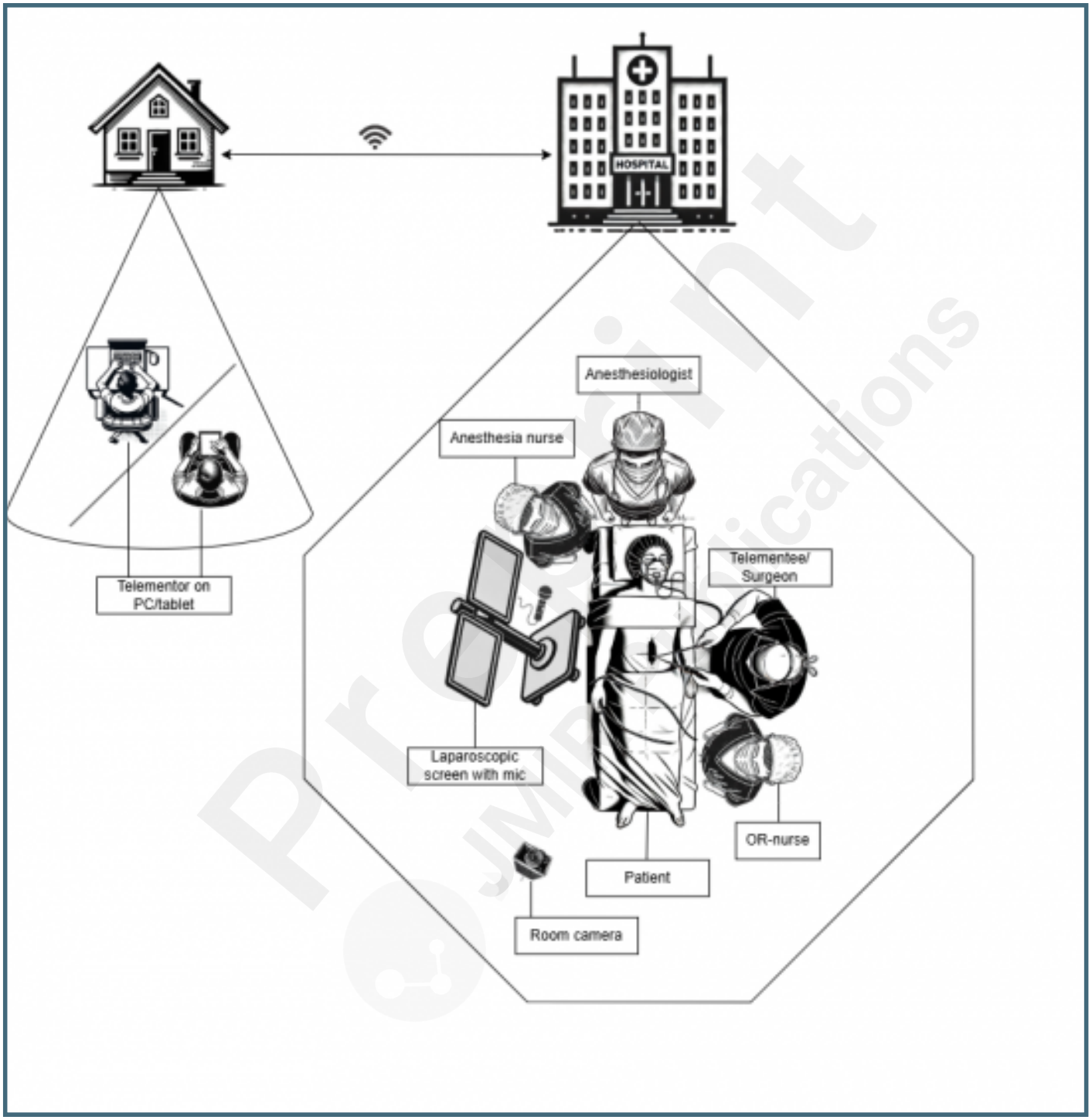
Supplementary Files

Figures

OR set up during the telementoring session. The telementee wears a headset for verbal communication with a remotely located telementor. An additional microphone placed in front of the operating screen catches verbal communication in the OR. The telementor can switch views between the laparoscopic footage and the footage from the room camera.



Global Operative Assessment of Laparoscopic Skills (GOALS).

DEPTH PERCEPTION

1. Constantly overshoots target, wide swings, slow to correct
2.
3. Some overshooting or missing target, but quick to correct
4.
5. Accurately directs instruments in the correct plane to target

BIMANUAL DEXTERITY

1. Uses only one hand, ignores non dominant hand, poor coordination between hands
2.
3. Uses both hands, but does not optimize interaction between hands
4.
5. Expertly uses both hands in a complementary manner to provide optimal exposure

EFFICIENCY

1. Uncertain, inefficient efforts, many tentative movements, constantly changing focus or persisting without progress
2.
3. Slow, but planned movements are reasonably organized
4.
5. Confident, efficient and safe conduct, maintains focus on task until it is better performed by way of an alternative approach

TISSUE HANDLING

1. Rough movements, tears tissue, injures adjacent structures, poor grasper control, grasper frequently slips
2.
3. Handles tissue reasonably well, minor trauma to adjacent tissue (i.e. occasional unnecessary bleeding or slipping of the grasper)
4.
5. Handles tissues well, applies appropriate traction, negligible injury to adjacent structures

AUTONOMY

1. Unable to complete entire task, even with verbal guidance
2.
3. Able to complete task safely with moderate guidance
4.
5. Able to complete task independently without prompting

Total Score _____/25

NOTSS scoring scale (non-technical surgical skills).

Category	Category Rating	Elements	Element Rating
Situation Awareness	1-2-3-4	Gathering Information	1-2-3-4
		Understanding Information	1-2-3-4
		Projecting and Anticipating Future State	1-2-3-4
Decision Making	1-2-3-4	Considering Options	1-2-3-4
		Selecting and Communicating Options	1-2-3-4
		Implementing and Reviewing Decisions	1-2-3-4
Communication and Teamwork	1-2-3-4	Exchanging Information	1-2-3-4
		Establishing Shared Understanding	1-2-3-4
		Coordinating Team Activities	1-2-3-4
Leadership	1-2-3-4	Setting and Maintaining Standards	1-2-3-4
		Supporting Others	1-2-3-4
		Coping With Pressure	1-2-3-4

Resident satisfaction survey.

The quality of the overall teaching experience was good.
1----------2----------3----------4----------5

The proctor`s briefing informed me how to complete the surgical task/objective.
1----------2----------3----------4----------5

The proctor`s briefing made me familiar with using the tools that I was given and its uses.
1----------2----------3----------4----------5

I felt comfortable performing this procedure with remote/onsite mentor.
1----------2----------3----------4----------5

The setup and presence of the distant/onsite proctor did not interfere with me being able to perform the procedure.
1----------2----------3----------4----------5

The remote/onsite proctor enhanced the learning experience.
1----------2----------3----------4----------5

I felt that the telestration facilitated the proctoring experience.
1----------2----------3----------4----------5

Write any additional thoughts or ideas which you feel may improve on the experience on the back.

Telementor satisfaction survey.

The quality of the overall teaching experience was good.
1----------2----------3----------4----------5

I was able to give practical instructions on how to complete the surgical objective.
1----------2----------3----------4----------5

I was able to make the mentee familiar with using the tools that he/she was given and its uses.
1----------2----------3----------4----------5

I felt comfortable guiding the mentee from a remote location.
1----------2----------3----------4----------5

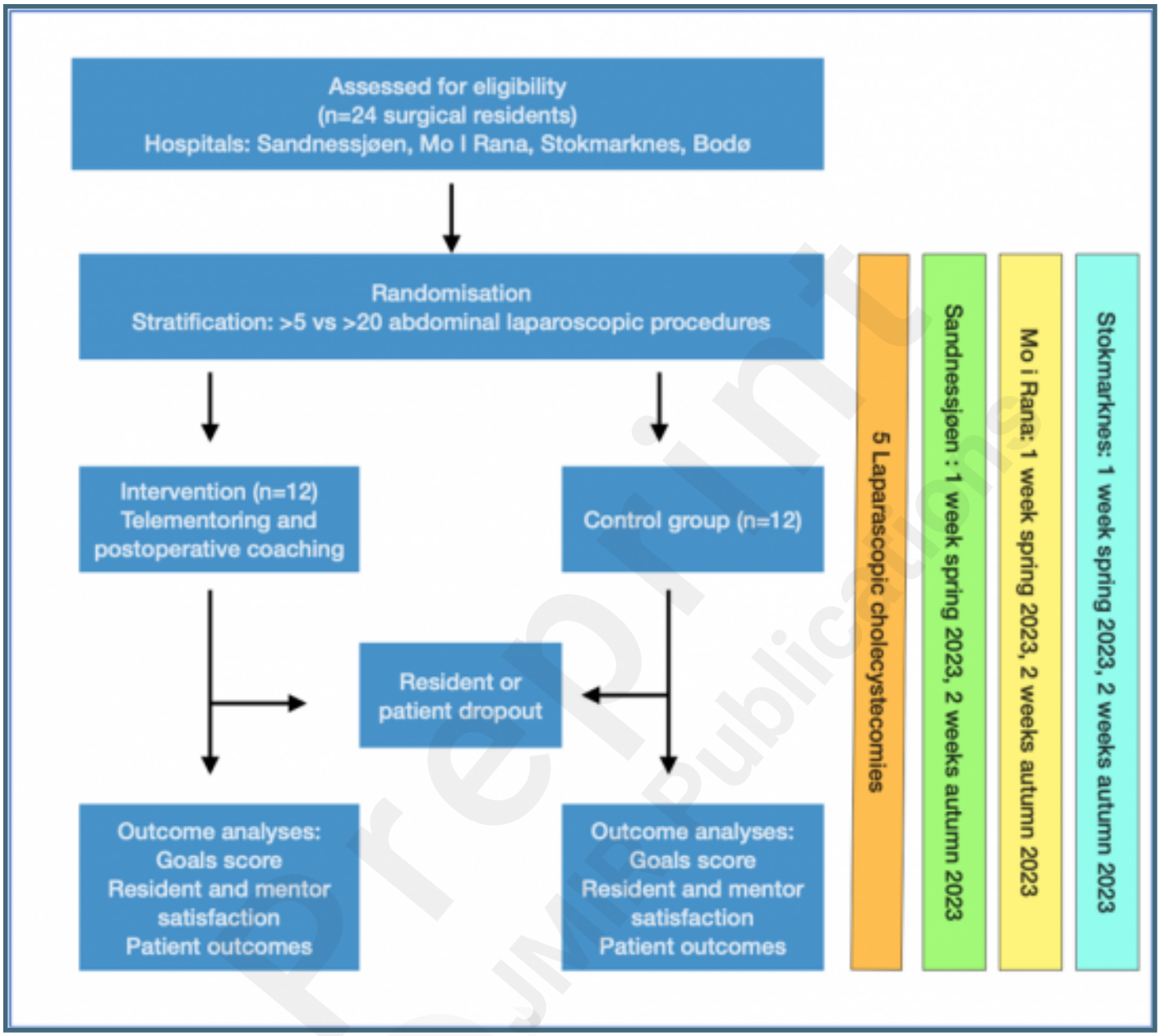
The setup and presence of the remote mentee did not interfere with me being able to guide the operating mentee.
1----------2----------3----------4----------5

The remote mentorship enhanced the learning experience.
1----------2----------3----------4----------5

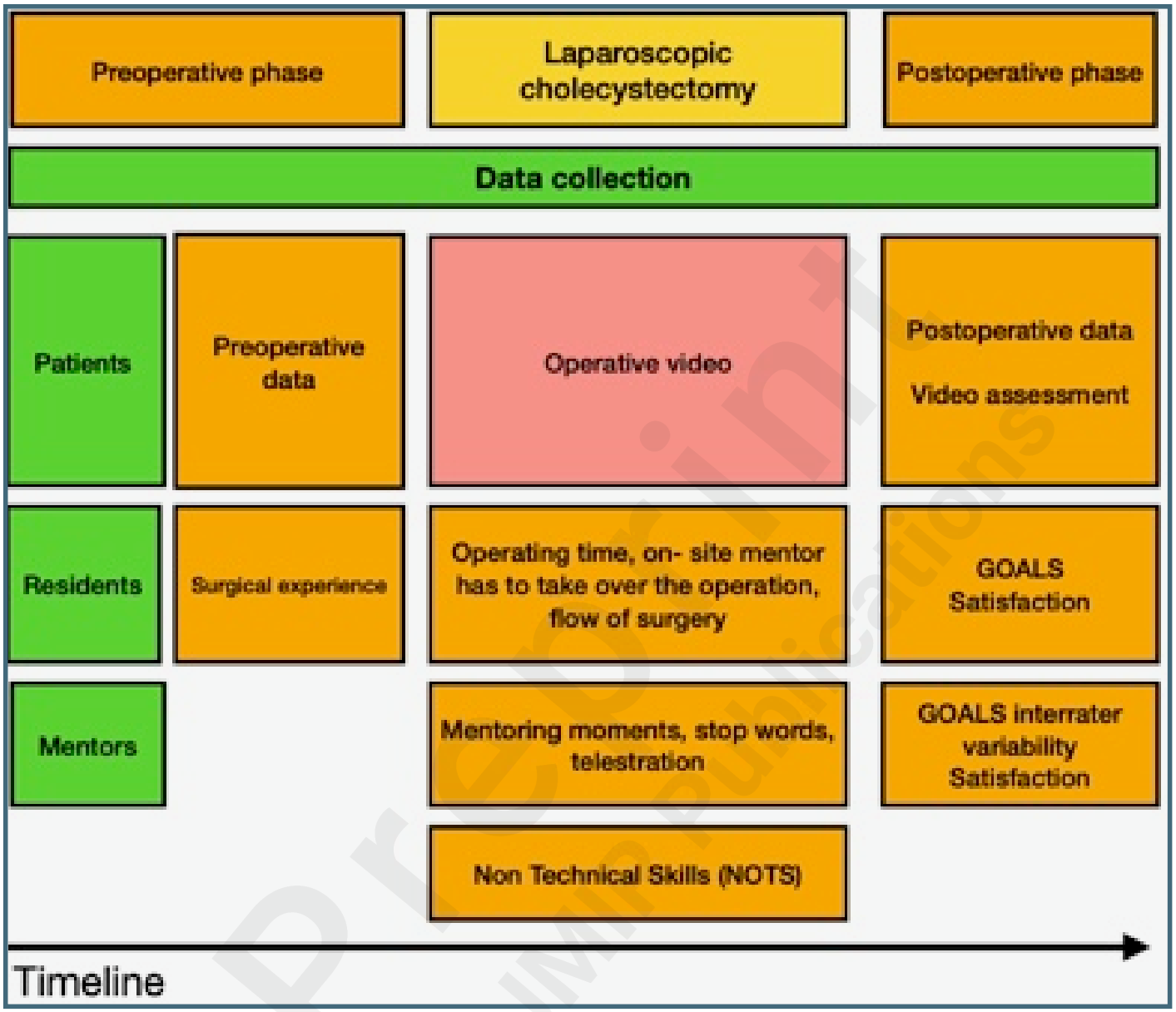
I felt that the telestration facilitated the mentoring experience.
1----------2----------3----------4----------5

Write any additional thoughts or ideas which you feel may improve on the experience on the back.

CONSORT diagram design of the SURGTEACH Trial.



Trial data collection.



CONSORT (or other) checklists

CONSORT checklist.
URL: http://asset.jmir.pub/assets/b1f3b93d0602d7a86f68a6fa08abc88b.pdf