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Cognitive training in robotic surgery

Submission date
01/04/2016

Recruitment status
No longer recruiting

Registration date
21/04/2016

Overall study status
Completed

Last Edited
17/07/2019

Condition category
Surgery

[_] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[X] Results
[_] Individual participant data

Plain English summary of protocol

Background and study aims
In recent years surgical training has had to undergo big changes. Introduction of the European working times directive has limited the amount of training time for surgeons and the introduction of complex new surgical techniques means that surgeons need to develop skills in a far broader range of procedures. Alongside this, the ever increasing financial pressures on healthcare systems all around means that there is less and less money available for training new surgeons. As a result of this, surgical trainers have needed to develop new ways of teaching, and a very promising new technique is cognitive training, also known as mental rehearsal. Mental rehearsal or cognitive training describes the act of rehearsing a sequence of motions or tasks in one's mind without actually making any physical movements. A major benefit of this will be that surgeons can then train for operations outside of the operating room. Not only is this a lot cheaper but it also means that a lot of training can be performed without putting patients at risk. Cognitive training has already been shown to work well in sports science and the airline industry. For example one experiment showed that if tennis players just imagined playing a front hand shot, their actual performance of a forehand shot at a subsequent test would improve. However cognitive training has only undergone very limited testing in surgery and has never before been tested in robotic surgery. The aim of this study is to test whether cognitive training is helpful in improving skills in robotic surgery. Both technical skills, where the surgeon is assessed on how well they can perform the operation and non-technical skills, which assesses how well the surgeons interact with the surgical team and work in a team will be investigated. As a result of this study, the researchers hope to find out if cognitive training can be used in teaching surgeons how to perform robotic surgery. Following on from this study will then need to determine exactly which technique for cognitive training is best (only one used in this study) and for how long and when trainees should perform cognitive training. This will allow cognitive training to be formally introduced into the surgical curriculum.

Who can participate?
Medical students and junior doctors who don't have any experience in performing robotic surgery.

What does the study involve?
Participants are randomly allocated to one of two groups, an interventional group or a control group. All participants in both groups undergo basic robotic surgical training using a virtual reality simulator. Those in the interventional group then have cognitive training in a suturing

procedure where they are taught to imagine how to perform the procedure. Participants in the control group watch a standard educational video about the procedure. All the participants then complete a suturing exercise in a mock operating room using a surgical robot. During the procedure three stressors (i.e. things that cause stress levels to rise), conversation, music and patient alarms, are also introduced to see how the participants respond.

What are the possible benefits and risks of participating?
There are no risks to participating. The benefits are training in an advanced and cutting edge surgical technique.

Where is the study run from?
Sherman Simulation Lab, King's College London, Guy's Hospital, London

When is study starting and how long is it expected to run for?
August 2015 to May 2016

Who is the main contact?
Dr Nicholas Raison

Contact information

Type(s)
Scientific

Contact name
Dr Nicholas Raison

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Additional identifiers

Study information

Scientific Title
Randomised controlled trial for development & evaluation of cognitive training for robot assisted surgery (RAS)

Study objectives
Cognitive training improves technical and non technical skills in robotic surgery

Ethics approval required
Old ethics approval format

Ethics approval(s)

Biomedical Sciences, Dentistry, Medicine and Natural & Mathematical Sciences Research Ethics Subcommittee, King's College London, 13/10/2015, ref: LRS-15/16-1950

Primary study design
Interventional

Study design
Single centre randomised controlled trial

Study type(s)
Other

Health condition(s) or problem(s) studied
Cognitive training

Interventions
All participants underwent identical initial training. This consisted of training in basic suturing training using a benchtop plastic model. Following this all participants underwent basic robotic skills training in which they completed two tasks on the DV-Trainer virtual reality simulator including a robotic suturing task. The participants were then randomly assigned to one of two groups:

1. Intervention group: Participants underwent cognition training. This consisted of mental rehearsing the steps of the procedure (robotic suturing) using a mental rehearsal script
2. Control group: Participants were shown in a video of the procedure being performed which constituted standard training

Intervention Type
Other

Primary outcome(s)
1. Technical robotic surgical skill will be measured using the GEARS validated scoring system
2. Non technical skills will be measures using the NOTSS validated scoring system

Both scores will be determined by two blinded experts who will review and assess videos of the individual participant’s performances post hoc.

Key secondary outcome(s)
1. Assessing vividness of mental imagery using the Mental imagery questionnaire
2. Participant opinion, evaluated using a feedback questionnaire

Completion date
01/05/2016

Eligibility

Key inclusion criteria
Medical students and doctors without any prior experience in performing robotic surgery and without independent surgical experience of any kind.

Participant type(s)
Mixed

Healthy volunteers allowed
No

Age group
Adult

Sex
All

Total final enrolment
62

Key exclusion criteria
1. Non-medically trained participants
2. Participants unable to attend requisite training and evaluation sessions
3. Participants with prior training in robotic surgery or non technical surgical skills

Date of first enrolment
01/08/2015

Date of final enrolment
30/08/2015

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
King's College London
London
United Kingdom
SE1 9RT

Sponsor information

Organisation
King's College London

ROR

https://ror.org/0220mzb33

Funder(s)

Funder type
Research organisation

Funder Name
Vattikuti Foundation

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	results	01/12/2018	17/07/2019	Yes	No