ORTHOPAEDIC TRAUMA ASSOCIATION
Education •• Research •• Service
9400 West Higgins Road, Rosemont, IL 60018-4976
Telephone (847) 698-1631 - FAX (847) 823-0536
Website: http://www.ota.org

SECTION 1

PROPOSAL RESEARCH GRANT APPLICATION

Application Detailed Instructions Link

Total Amount Requested: $ 20,000 DATE: 14-06-2020

This request is made by the undersigned, who also agree(s) to comply with the following:

(1) Funds granted as a result of the request are to be expended for the purposes set forth herein.
(2) All reports or original investigations supported by any grant made as a result of this request shall acknowledge support provided by the Orthopaedic Trauma Association.
(3) Reports will be made as required and necessary records and accounts, including financial and property controls, will be maintained and made available to the Orthopaedic Trauma Association.

NAME	TITLE	DEPARTMENT	SIGNATURE
Principal Investigator: Michael Edwards	MD PhD	Traumasurgery	 Phone: +31 24 36 13 871 Fax: +3124 35 40 501 E-mail: Michael.edwards@radboudumc.nl
Co-Principal Investigator: Emily Boersma	MD	Surgery	 Phone: +31 64640 7663 Fax: +3124 35 40 501 E-mail: Emily.boersma@radboudumc.nl
OTHER INVESTIGATORS ASSOCIATED WITH PROJECT:			
Erik van de Krol	MD	Trauma surgery	

Institution Name and Address:
Radboud university medical center
Department of Surgery (618)
Geert Grooteplein Zuid 10
6525 GA Nijmegen
The Netherlands

SECTION 2

ABSTRACT OF RESEARCH PLAN

PROJECT TITLE:

Cast OFF-2: One versus four-five weeks of plaster cast immobilization for non-reduced distal radius fractures. A randomized stepped wedge design.

Abstract of research plan: Please provide an abstract of 250 words or less with 5 underlined phrases for a project summary. Please avoid summaries of past accomplishments and the use of the first person. The abstract is meant to serve as a succinct and accurate description of the proposed work when separated from the application.

Distal radius fracture (DRF) is a common fracture and the majority of these fractures is stable. It is our hypothesis that one week of plaster cast treatment will give a better functional outcome score as Patient Rated Wrist Evaluation (PRWE) and a lower pain score at 6 weeks post injury and will be less costly as compared to the control group (usual care) of four to five weeks of plaster cast treatment for non-reduced DRF. No difference in complications is expected.

The study design will be a multicenter stepped wedge design. Patients with an isolated non-reduced DRF between the age of 18 and 85 years old will be included. Patients in the intervention group will be treated with plaster cast for one week and patients in the control group with plaster cast for four-five weeks. Patient reported outcomes, quality of life, complications, pain catastrophizing score, pain, patient satisfaction and cost effectiveness will be measured. Total follow-up will be 12 months.

This study aims to provide a strong basis for an (inter)national guideline in trauma surgery for using one week of plaster cast treatment for non-reduced DRF's. The expected stronger evidence base will assist in changing attitudes of clinicians and lead to adoption of the one- week plaster cast treatment. In addition, there is a large added value for patients as the immobilization time will be shorter which will lead to faster mobilization of the arm, less pain, earlier return to work and more comfort with a smaller immobilization period.

SECTION 3

FACILITIES – Laboratory Space and Major Equipment

Please provide an accurate description of laboratory facilities and major equipment available at the grantee's institution that will support this project. Please recall the list of supplies and support that the grantee's institution, or grant funds other than those from the OTA, are expected to provide:
click to see the list

The following facilities will be used and provided by our own university and department, Radboudumc department of Surgery.

- Maintenance service and service contracts. Especially contracts between the different hospitals for the study will be written by our department.
- Telephone service. This will be provided by our department.
- Library service. All PhD students and colleagues working at our University have free access to the university library.
- Office equipment and work space will be provided by our department.
- Salary of the principal investigator will be provided by the department of Trauma surgery and the Radboudumc. The same applies for the salary of secretary personnel. The salary of the co-principal investigator and the PhD student who will be conducting the study will be partly funded by this grant, OTC grant, the department of Trauma surgery and if necessary other funds.
- Insurance for patients and liability are provided by the hospital Radboudumc and the department of Trauma surgery.
- Other expenses as database costs and statistician personnel costs will be provided by the department of Surgery.

SECTION 4

RESEARCH PLAN

Click for Research Plan Instructions

A. SCIENTIFIC AIMS (not exceed 400 words)

The hypothesis of this study is that one week of plaster cast treatment will give a lower PRWE score (less pain and better physical function) and pain score and will be less costly compared to the control group who will receive four-five weeks of plaster cast treatment for non-reduced DRF. There is no difference in complications expected.

Eventually we would like to provide the evidence that one week of plaster cast treatment is enough for unreduced DRF and like to give to evidence for implementation into daily practice.

During this study, a cost-effectiveness analysis will be performed. Our hypothesis is that one week of plaster cast reduces the costs by one outpatient clinic visit and one circular cast for three weeks. In addition, we hypothesize that one week of plaster cast immobilization will lead to an estimated average of seven workdays earlier return to work which will lead to a large potential cost saving. Estimated for the Netherlands, using a workweek of 38 hours with 65% patients working at a full-time job would lead to eight million euro's potential cost saving.

B. BACKGROUND & SIGNIFICANCE (not to exceed 400 words)

Distal radius fracture (DRF) is a common fracture of which the incidence appears to be increasing worldwide (1, 2). On average, a total of 17% of all diagnosed fractures are DRF's (3, 4). In recent years, there has been an increased interest in treatment of DRF's caused by increasing prevalence and minimal invasive surgical techniques. However, recent literature has mainly focused on treatment options for unstable DRF (5, 6). To date, there are few studies that have investigated the length of plaster cast for non-operatively treated, stable DRF (7, 8). Moreover, these studies date back many years and do not investigate non reduced DRF. Investigating a good treatment modality for non-reduced DRF is therefore important. Recent studies have shown that a long period of immobilization can lead to more post traumatic pain due to an increase in disuse and kinesiophobia (9-11). Early mobilization after a period of plaster cast is expected to reduce the incidence of post-traumatic pain including complex regional pain syndrome (CRPS). The Dutch guideline takes this into account and advocates a liberal advice concerning necessary weeks of immobilization after a non-displaced DRF, one to three weeks (5). However, they mention to take this into account as the evidence is very low. Due to the scarce evidence the guideline provides, the immobilization period for non-reduced DRF is still often four to five weeks. We believe that a cast-immobilization of just one week will suffice and will improve the number of days patients are not working due to their DRF, reduce the need for pain medication (less chance for opioid addiction) and reduces the incidence of post traumatic pain (CRPS).

This study aims to provide a strong basis for an (inter)national guideline in trauma surgery for using one week of plaster cast treatment for non-reduced DRF's. The expected stronger evidence base will assist in changing attitudes of clinicians and lead to adoption of the one- week plaster cast intervention. There is a large added value for patients due to faster mobilization of the arm, less pain, earlier return to work and more comfort with a smaller immobilization period. In addition, one week of plaster cast will reduce visits to the outpatient clinic which will lead to cost effectiveness for clinical practices. There will also be a socio-economic advantage due to earlier return to work which will lead to more savings by less time lost from work.

C. PREVIOUS WORK DONE ON THE PROJECT (Not to exceed 400 words)

The Dutch guideline mentions that shorter immobilization may have the same functional outcome as longer immobilization periods and therefore advises (with low evidence) to treat non-reduced DRF for one to three weeks with plaster cast (5). The evidence dates back many years. However, almost all hospitals in the Netherlands are treating patients with a non-reduced DRF with at least three weeks of plaster cast immobilization and even

sometimes for six weeks. To provide extra evidence that one week of plaster cast treatment is feasible for non-reduced DRF we performed a feasibility study, NL59217.091.17. This study included 40 patients. Patients were randomized in the intervention group (one week of plaster cast treatment) or the control group (four-five weeks of plaster cast treatment, usual care) for non-reduced DRF. During this study the results were positive. There was no difference shown between the two groups for secondary displacement (1 vs 0 for control vs intervention). In addition, we saw a trend in having less pain and better function after 6 weeks (DASH control 28.8 vs intervention 15.6, p = 0.051, PRWE control 33.1 vs intervention 24.5, p = 0.25 and PROMIS PI control 56.7 vs intervention 51.6, p = 0.042). Patients in the intervention went earlier to work, had better patient satisfaction and we saw no differences in complications between the two groups.

D. METHOD (not to exceed 1200 words and 4 pages)

A multicenter stepped wedge design with 10 clusters is constructed, expecting to include 4 patients per cluster per time period (Table 1). Every cluster will be randomized to a step, the moment when a cluster will start with the intervention. One time period is one month. We added a transition period of one time point, one month, between the control and intervention treatment. This transition period is meant for explaining the treatment and to give instructions to the hospitals and care givers to make sure all patients will be treated as described in the intervention protocol. With the transition period, the researcher can focus on one hospital to make sure the protocol is followed. We expect to include 4 patients per cluster per month. This will eventually lead to 440 included patients.

Table 1

CLUSTER	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12
1	0		1	1	1	1	1	1	1	1	1	1
2	0	0		1	1	1	1	1	1	1	1	1
3	0	0	0		1	1	1	1	1	1	1	1
4	0	0	0	0		1	1	1	1	1	1	1
5	0	0	0	0	0		1	1	1	1	1	1
6	0	0	0	0	0	0		1	1	1	1	1
7	0	0	0	0	0	0	0		1	1	1	1
8	0	0	0	0	0	0	0	0		1	1	1
9	0	0	0	0	0	0	0	0	0		1	1
10	0	0	0	0	0	0	0	0	0	0		1

0 = Control group, four-five weeks of plaster cast treatment.
1 = Intervention group, one week of plaster cast treatment.
T= One month

At the moment the following hospitals already agreed to participate in the study: Radboudumc, MUMC, Canisius Wilhelmina hospital, Pantein, Elizabeth Twee Steden hospital, Gelderse Vallei, Medisch Spectrum Twente and Catharina hospital. Every hospital gave an estimation of the annual number of treated non reduced DRF patients, see table 2.

Table 2 Hospitals wanting to participate

Hospital	Expected non reduced DRF patients per year	Expected inclusion per month
RadboudUmc	22	2
MUMC	150	12.5
Canisius Wilhelmina Hospital	174	14.5
Pantein	61	5
Elizabeth Twee Steden Hospital	202	17
Gelderse Vallei	214	17
Medisch Spectrum Twente	-	-
Catharina Hospital	103	8.6

Patients with acute non-reduced DRF (intra- and extra-articular DRF) who are diagnosed at the emergency room will be included in the study. Patients need to be between the age of 18 and 85 years old, have an isolated non-reduced DRF, a good understanding of the Dutch language and live independently without too much care at home. Patients will be informed about the study at the emergency room. One week later the patients are asked for an informed consent (for use of their medical data and follow-up period). Patients will be treated following the treatment schedule for their hospital. All patients will start in the control group, depending on the randomization, the treatment will change to the intervention and all consecutive patients will start being treated as by the intervention protocol.

Nowadays the usual care (Control group) for non-reduced DRF's is immobilization for four – five weeks. After one week the plaster cast is changed to a circular cast. Four-five weeks post injury patients will be seen at the outpatient clinic, plaster cast will be removed and a home exercise program will be explained.
For patients in the intervention group the splint will be removed after one week and a home exercise program will be explained. After four-five weeks, patients will be seen at the outpatient clinic for follow-up and several extra questions will be asked. The follow-up period will start after their last outpatient clinic visit.
The primary outcome measure is the functional outcome measured by the PRWE at six weeks post injury. Other patient reported outcome scores (PRO's), complications, pain interference (PROMIS Pain Interference), pain catastrophizing scale (PCS-4), patient satisfaction and quality of life (Short Form – 36 (SF-36)) will be measured as secondary outcomes at six weeks, three, six and 12 months post injury. In addition, during the first two months, a five-minute short questionnaire needs to be completed every week, including questions about return to activity and pain. All questionnaires will be sent by email or mail.

A cost-effectiveness analysis will be performed.

We used the stepped wedge sample size tool in STATA.
A sample size of 330 patients was calculated with a power of 0.85, alfa of 0.05 and ICC of 0.01. We designed the stepped wedge design for 10 hospitals with 3 patients per cluster per time period (Table 1). In order to account for 30% loss to follow-up we aim for a sample size of 440 patients, i.e. 4 patients per cluster per month (Table 3).

The sample size was based on the PRWE score, the primary outcome measure. A difference of 10 points is needed for a relevant clinical difference. We used data from our pilot study for the reference values (12).

Descriptive analyses with median, range and percentage will be used to describe demographic variables and outcomes such as age and gender. A multivariate linear regression mixed model will be used to analyze the data from the different randomization groups and to account for clustering of repeated measurements within patients and within hospitals and time. We will analyze the effect of the intervention, in comparison with the usual care, on the primary outcome, PROs, return to activity, pain scores and complication rate. We will adjust for confounding factors such as, age, gender, clinical parameters.

A cost-effectiveness analysis is performed along-side the underlying stepped wedge trial. The Health care Institute of the Netherlands (ZIN) 2016 guideline for economic evaluations forms the basis of the analysis (13). Health care consumption from inclusion to final follow-up of the patient is measured. This is in line with the measurement pathway of the clinical study. Healthcare consumption is multiplied by unit-costs associated with healthcare consumption. Also, productivity related cost seems to play an important role. Therefore, the societal perspective is the base case. A healthcare perspective is used as the scenario.

A budget impact analysis will be performed from various perspectives with the budgetary framework for the care as the base case perspective (budgettair kader zorg). Here too, the ZIN 2016 guideline serves as a starting point for the analysis. The analysis will be performed in accordance with the ISPOR Principles of Good Practice for Budget Impact Analysis (14).

E. REFERENCES **(not to exceed 2 pages)**

1. Brogren E, Petranek M, Atroshi I. Incidence and characteristics of distal radius fractures in a southern Swedish region. BMC Musculoskelet Disord. 2007;8:48.
2. MacIntyre NJ, Dewan N. Epidemiology of distal radius fractures and factors predicting risk and prognosis. J Hand Ther. 2016;29(2):136-45.
3. Owen RA, Melton LJ, 3rd, Johnson KA, Ilstrup DM, Riggs BL. Incidence of Colles' fracture in a North American community. Am J Public Health. 1982;72(6):605-7.
4. Singer BR, McLauchlan GJ, Robinson CM, Christie J. Epidemiology of fractures in 15,000 adults: the influence of age and gender. J Bone Joint Surg Br. 1998;80(2):243-8.
5. Brink PRG BN, Deijkers RLM, van Eerten PV, Kolkman S, van Loon J et al. Guidelines Distal Radius fractures, diagnosis and treatment. 2010.
6. Walenkamp MM, Bentohami A, Beerekamp MS, Peters RW, van der Heiden R, Goslings JC, et al. Functional outcome in patients with unstable distal radius fractures, volar locking plate versus external fixation: a meta-analysis. Strategies Trauma Limb Reconstr. 2013;8(2):67-75.
7. Jensen MRA, K.H.; Jensen C.H. Management of undisplaced Colles' fractures: one or three weeks of immobilization. J Orthop Sci. 1997;2:424-7.
8. Stoffelen D, Broos P. Minimally displaced distal radius fractures: do they need plaster treatment? J Trauma. 1998;44(3):503-5.
9. Friesgaard KD, Gromov K, Knudsen LF, Brix M, Troelsen A, Nikolajsen L. Persistent pain is common 1 year after ankle and wrist fracture surgery: a register-based questionnaire study. Br J Anaesth. 2016;116(5):655-61.
10. Terkelsen AJ, Bach FW, Jensen TS. Experimental forearm immobilization in humans induces cold and mechanical hyperalgesia. Anesthesiology. 2008;109(2):297-307.
11. van de Meent H, Oerlemans M, Bruggeman A, Klomp F, van Dongen R, Oostendorp R, et al. Safety of "pain exposure" physical therapy in patients with complex regional pain syndrome type 1. Pain. 2011;152(6):1431-8.
12. Walenkamp MM, de Muinck Keizer RJ, Goslings JC, Vos LM, Rosenwasser MP, Schep NW. The minimum clinically important difference of the Patient-rated Wrist Evaluation Score for patients with distal radius fracture. Clin Orthop Relat Res. 2015;473(10):3235-41.
13. Hakkaart-van Roijen L ea. Handleiding voor kostenonderzoek, methoden en standaard kostprijzen voor economische evaluaties in de gezondheidszorg. In: Zorgverzekeringen Cv, (ed.). 2016.
14. Sullivan SD ea. Principles of good practice for budget impact analysis II: Report of the ISPOR Task Force on Good Research Practices – Budget Impact Analysis. 2014; 17

F. FIGURES (if figures added outside of the text pages – **not to exceed 1 page**)

Not applicable.

SECTION 5

BIOGRAPHICAL SKETCH

Not to exceed two pages for each person. Copy and paste below the two Bio-Sketch pages for each additional Investigator.

NAME Michael Edwards	TITLE MD PhD	BIRTHDATE (Mo., Day, Yr.) 06-22-1969
PLACE OF BIRTH **(**City, State. Country**)** Delft, Netherlands	NATIONALITY (If non-US citizen indicate visa status**)** Dutch	SEX (right click on the check in box/properties/default value/checked Male ☒ Female ☐

EDUCATION (Begin with baccalaureate training and include postdoctoral.)

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
LUMC, Leiden, NL	Bachelors and masters	1995	Medicine
Rode Kruis hospital, Leiden, NL	Resident in Trainee	1998-2003	Surgery
Erasmus University, Rotterdam, NL	Fellowship	2003-2004	Traumatology
Radboudumc and EMGO Amsterdam, Nijmegen and Amsterdan, NL	Degree A	2008-2009	Epidemiology

RELATIONSHIP TO PROPOSED PROJECT	MAJOR RESEARCH INTEREST
Principal Investigator	Trauma surgery, Wrist surgery

HONORS

1995 1th Price best presentation national congress of Dutch Trauma Surgery Residents
1997 1th Price Trauma research presentation Dutch Association of Trauma surgery
2002 1th Price best thesis Dutch Association Trauma Surgery

OTHER RESEARCH SUPPORT

2010-2014: AO foundation research Grant
2010-2014: Ribfixation study, a syntheses research grant
2010-2014: REACT 2/Re-Tract study, ZonMW grant
2014-2016: Osseo integrated protheses

RESEARCH AND/OR PROFESSIONAL EXPERIENCE (Start with present position: list ALL experience relevant to project. Include publications.)

2012 – present Professor of Trauma surgery at Radboudumc.

President National Board of Trauma Surgery Professors

2019 – present President of OTC foundation

2001 PhD in Trauma surgery; Quantificantion of extra and intramural emergency department care.

Promotor of several PhD Candidates. Research on ankle, hip and wrist fractures.

PhD's finished

2019	Promotor	E. Hermans	Hipfractures
2018	Promotor	N. Kraayvanger	Emergency department self referral
2017	Promotor	J. Peters	ABC prehospital
2015	Promotor	J. Sierink	Total body CT scanning
2014	Promotor	R. van Vugt	Follow-up Tract study
2013	Promotor	C. Donken	Ankle fractures
2009	Copromotor	M. Brink	TRACT study
2009	Copromotor	J. Deunk	TRACT study
2007	Copromotor	S.P.G. Frankema	Quality in trauma care systems

Present PhD students

2018-2022	Promotor	D. Reetz	Custom made implants
2017-2021	Promotor	E. Boersma	Distal Radius fractures
2016-2020	Promotor	L. van Silfhout	Neurosurgery
2016-2020	Promotor	L. Brouwers	3D navigation hipfractures
2015-2018	Promotor	B. Frietman	3D and hipsfractures
2016-2020	Promotor	H. Janzing	Wristfractures

NAME Emily Boersma	TITLE MD	BIRTHDATE (Mo., Day, Yr.) 04-27-1993
PLACE OF BIRTH **(**City, State. Country**)** Amsterdam, Netherlands	NATIONALITY (If non-US citizen indicate visa status**)** Dutch	SEX (right click on the check in box/properties/default value/checked Male ☐ Female ☒

EDUCATION (Begin with baccalaureate training and include postdoctoral.)

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
Radboudumc, Nijmegen, NL	Bachelors and masters	2018	Medicine
Radboudumc, Nijmegen, NL	Resident not in Trainee	06/2018-12/2019	Surgery
Rijnstate, Arnhem, NL	Resident not in trainee	01/2020-present	Surgery

RELATIONSHIP TO PROPOSED PROJECT	MAJOR RESEARCH INTEREST
Co-principal Investigator	Trauma surgery, Wrist surgery

HONORS

Dec 2019: Poster award for the Cast_OFF pilot study, Dutch Association Trauma Surgery

OTHER RESEARCH SUPPORT

Not applicable

RESEARCH AND/OR PROFESSIONAL EXPERIENCE (Start with present position: list ALL experience relevant to project. Include publications.)

2017-present: PhD student, non-operative care for Distal Radius Fractures.

Following articles:

EZ Boersma, H vd Meent, FP Klomp, JP M Frölke, MWG Nijhuis-van der Sanden, MJR Edwards. Treatment of distal radius fracture; Does early activation lead to a lower incidence of Complex Regional Pain Syndrome? HAND.

E Boersma, FP Klomp, H van de Meent, JP M Frölke. Prevention of Complex Regional Pain Syndrome type 1 after conservative treatment of a distal radius fracture with a home exercise program: A proof-of-concept study. Acta orthop Belgica.

EZ. Boersma, JTP Kortlever, MWG Nijhuis - van der Sanden, MJR Edwards, D Ring, T Teunis. Reliability of Recommendations to Reduce a Fracture of the Distal Radius. Submitted Acta orthopedica.

EZ. Boersma, MWG Nijhuis - van der Sanden, MJR Edwards, D Ring, T Teunis. Satisfaction with Alignment after Reduction of a Displaced Fracture of the Distal Radius. Submitted JBJS.

T. Groeneveld, EZ Boersma, FW Bloemers, T Blokhuis, JPM Frolke. Decreasing incidence of complex regional pain syndrome in the Netherlands: a retrospective multicenter study. Submutted to Journal of Pain.

Research Internship for 6 months with Prof Dr David Ring in Austin, Texas.

Following publications:

EZ Boersma, TJ Crijns, MWG Nijhuis-vanderSanden, MJR Edwards, D Ring, S Janssen. Accuracy and Reliability of MRI-reports to determine which shoulder is symptomatic for workers compensation patients with unilateral symptoms. Journal of Orthopaedics

EZ Boersma, JTP Kortlever, MD Loeb, J McDonald, GA Vagner, D Ring, M Driscoll. The association between Patient Reported Outcome Meassurement Scores and preference for specific interventions. Journal of Patient Experience.

JSE Ottenhoff, JTP Kortlever, EZ Boersma, DC Laverty, D Ring, MD Discroll. Adverse Childhood Experiences Are Not Associated With Patient-reported Outcome Measures in Patients With Musculoskeletal Illness. Clin Relat Orthop Res. 2019; 477: 219-228.

TJ Crijns, EZ Boersma, S Janssen, M Tonn, D Ring. Accuracy and reliability of diagnosing the injured knee. JAAOS submitted.

Other publications:

E Boersma, T Menting, M Reijnen. Cysteuze adventitia ziekte: Een zwelling in de pols is niet altijd een ganglion. EZ Boersma, TP Menting, MMPJ Reijnen. NTvG.

E. Boersma. Betere aanpak van seksuele intimidatie. Arts in Spe.

Conference presentations:

74th annual meeting ASSH, September 2019, Las Vegas, Nevada, USA
Oral presentation: The Association between Patient-Reported Outcome Measurement Scores and Preference for Specific Interventions

OTA (orthopaedic trauma association) annual meeting, oktober 2015 San Diego.
Oral presentation. Prevention of CRPS after a distal radius fracture.

SECTION 5 BIOGRAPHICAL SKETCH (continued)

NAME Erik van de Krol	TITLE MD	BIRTHDATE (Mo., Day, Yr.) 11-27-1976
PLACE OF BIRTH **(**City, State. Country**)**	NATIONALITY (If non-US citizen indicate visa status**)**	SEX (right click on the check in box/properties/default value/checked Male ☒ Female ☐

EDUCATION (Begin with baccalaureate training and include postdoctoral.)

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
VUMC, Amsterdam, Nl	Bachelors and Masters	2002	Medicine
UMCG, Groningen, NL / Medisch Spectrum Twente , Enschede, NL	Surgery trainee	2013	Surgery / Trauma surgery
Tygerberg hospital, Capetown, South Africa	Fellowship	2014-2015	Trauma surgery

RELATIONSHIP TO PROPOSED PROJECT	MAJOR RESEARCH INTEREST
Additional investigator	Trauma surgery, military surgery

HONORS

Not applicable

OTHER RESEARCH SUPPORT

Not applicable

RESEARCH AND/OR PROFESSIONAL EXPERIENCE (Start with present position: list ALL experience relevant to project. Include publications.)

2018 – present Traumasurgeon Radboudumc, Nijmegen, Nl

2013 – present Military surgeon, Dutch Department of Defence

Publications:

2000: European Surgical Research 32 (suppl 1) 2000: JPM Frölke, E van de Krol, FC Bakker, P Patka, HJTM Haarman; Destination of debris during intramedullary reaming
2000: Calcified Tissue International Vol. 66, Suppl. 1, 2000: Frölke JPM, Klein-Nulend J, Elzinga M, Van de Krol H, Semeins CM, Bakker FC, Patka P, Haarman HJThM, Burger EH; Bone cell growth in reaming debris
2000: Acta Orthopedica Belgica 2000; 66: 337-340 JPM Frölke, H van de Krol, FC Bakker, P Patka, HJThM Haarman; Destination of debris during intramedullary reaming, an experimental study on sheep femurs
2003: European Neuroendocrine Tumour Network symposium London, England (may-2003): BG Taal, H van de Krol, JM Ronday, JM Zuetenhorst, MLF van Velthuysen, FAN Zoetmulder Bowel surgery in metastatic carcinoid in a late phase: specific findings and clinical outcome
2020: Injury 51 (2020) 380-383; Validation of two methods to measure posterior tilt in femoral neck fractures

Presentation:

2013: Gevorderden Cursus Traumatologie, Zwolle, Nl (6 juni, 2013): H. Van de Krol, A.D.P. van Walsum. Gannet, solving ‘the unsolved fracture’

SECTION 6

RESEARCH SUPPORT, SUBMISSIONS

Please combine the information on this page for PI and Co-PI. Add additional lines and pages as needed, there is no word limit in this section.

Prior OTA Funding to Principal Investigator or Co-P.I.:			
SOURCE OF SUPPORT	TITLE OF PROJECT	AMOUNT	PERIOD OF
Not applicable			

Research Support to Principal Investigator or Co-PI Relevant to THIS Project Past 5 Years (Include That From Own Institution):			
SOURCE OF SUPPORT	TITLE OF PROJECT	AMOUNT	PERIOD OF
Not applicable			

Support To Principal Investigator or Co-PI for OTHER Research Projects:			
SOURCE OF SUPPORT	TITLE OF PROJECT	AMOUNT	PERIOD OF
Not applicable			

Previous Research:			
SOURCE OF SUPPORT	TITLE OF PROJECT	AMOUNT	PERIOD OF
Not applicable			

Current Research:			
SOURCE OF SUPPORT	TITLE OF PROJECT	AMOUNT	PERIOD OF
Partly funded by department of Surgery, Radboudumc	Cast-OFF, feasibility study.	6.000 euro	2018-2020
Marti Keuning-Eckhardt Sichting	PhD Dr. Boersma	4.000 euro	2018-2020

Submissions Of This Or Similar Project To Other Agencies**:**

SUBMITTED**:**

OTC grant

PLANNED: When other grant will be applicable, we will submit our project to those funds.