

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/138638> holds various files of this Leiden University dissertation.

**Author:** Veltman, E.S.

**Title:** Strategies in prevention and treatment of prosthetic joint infections

**Issue Date:** 2020-12-09

# **Strategies in prevention and treatment of prosthetic joint infections**

**Ewout S. Veltman**

Cover design: "Protheses en Beestjes" by Annebet Philips, [www.annebetphilips.nl](http://www.annebetphilips.nl)

Layout: Sanne Kassenberg, [www.persoonlijkproefschrift.nl](http://www.persoonlijkproefschrift.nl)

Printing: Ipkamp printing | [proefschriften.net](http://proefschriften.net)

ISBN: 978-94-6421-090-3

© 2020 E.S. Veltman. All rights reserved. No part of this thesis may be reproduced, distributed, stored in a retrieval system or transmitted in any form or by any means, without prior written permission of the author.

Publication of this thesis was kindly supported by:

Fysiotherapie Spieghel

Nederlandse Orthopaedische Vereniging, Stichting Wetenschap OLVG,

Link & Lima Nederland, Stichting Annafonds | NOREF, Sense Keukens, ABN Amro, Simendo B.V., Stichting ETB-BISLIFE, Smith and Nephew, Heraeus, iMove Medical,

ChipSoft, GD Medical, implantcast Benelux, Sectra Benelux, Vrest,

Bauerfeind Benelux B.V., Hanssen Footcare, Mathys Orthopaedics BV,

LM Orthopedie, D.H. Heijne stichting (Basko healthcare), Leader Biomedical,

Oudshoorn chirurgische techniek B.V., ConvaTec, Boehringer Ingelheim,

van Dinter Orthopedie, Nutricia Nederland BV, Eurocept Homecare,

Sport Medisch Centrum Amsterdam, Pfizer

# Strategies in Prevention and Treatment of Prosthetic Joint Infections

ACADEMISCH PROEFSCHRIFT

ter verkrijging van  
de graad van doctor aan de Universiteit Leiden  
op gezag van de Rector Magnificus prof.dr. C.J.J.M. Stolker,  
. volgens besluit van het College voor Promoties

te verdedigen op woensdag 9 december 2020 klokke 15.00 uur.

door Ewout Simon Veltman

geboren te Geldrop

in 1984

**PROMOTORES:**

Prof. dr. R.G.H.H. Nelissen

Prof. dr. R.W. Poolman

**CO-PROMOTOR:**

Dr. D.J.F. Moojen , OLVG Amsterdam

**LEDEN PROMOTIECOMMISSIE:**

Prof. dr. P.D.S. Dijkstra

Prof. dr. R.H.H. Groenwold

Prof. dr. P.C. Jutte, UMC Groningen

Dr. M. Wouthuizen-Bakker, UMC Groningen

"Voor Deli, voor haar voorwaardelijke steun.  
En voor mij, zonder wie dit boek er niet zou zijn geweest."  
(vrij naar: Adam Kay, *This is going to hurt*, 2017)



## **PUBLICATIONS CONTRIBUTING TO THIS THESIS**

**Antibiotic Prophylaxis and DAIR Treatment in Primary Total Hip and Knee Arthroplasty, A National Survey in The Netherlands.**

Veltman ES, Moojen DJF, Nelissen RGHH, Poolman RW.

*J Bone Jt Infect.* 2018 Jan 1;3(1):5-9.

**Similar risk of complete revision for infection with single-dose versus multiple-dose antibiotic prophylaxis in primary arthroplasty of the hip and knee: results of an observational cohort study in the Dutch Arthroplasty Register in 242,179 patients.**

Veltman ES, Moojen DJF, Lenguerrand E, Whitehouse D, Blom AW, Nelissen RGHH, Poolman RW.

*Acta Orthop.* 2020 Jul 23:1-7.

**Similar rate of infection eradication for functional articulating, prefabricated and custom-made spacers in 2-stage revision of the infected total hip: a literature review.**

Veltman ES, Moojen DJF, Glehr M, Poolman RW.

*Hip Int.* 2016 Jul 25;26(4):319-26.

**Improved Patient Reported Outcome and Infection Eradication Rate with Functional Articulating Spacers in Two-Stage Revision of the Infected Hip.**

Veltman ES, Moojen DJF, Poolman RW.

*status: revision submitted.*

**Two-Stage Revision Arthroplasty for Coagulase-Negative Staphylococcal Periprosthetic Joint Infection of the Hip and Knee.**

Veltman ES, Moojen DJF, Poolman RW.

*World J Orthop.* 2019 Oct 18;10(10):348-355.

**Revision for culture-negative total knee arthroplasties, a case-control clinical evaluation of functional and patient reported outcome of two-stage revision versus one-stage revision.**

Veltman ES, Moojen DJF, Poolman RW.

*status: submitted.*

## TABLE OF CONTENTS

Chapter 1:	General introduction and outline of this thesis.	10
<b>Section 1</b>	<b>Prevention of Periprosthetic Joint Infection</b>	<b>26</b>
Chapter 2:	Antibiotic Prophylaxis and DAIR Treatment in Primary Total Hip and Knee Arthroplasty, A National Survey in The Netherlands.	28
Chapter 3:	Similar risk of complete revision for infection with single-dose versus multiple-dose antibiotic prophylaxis in primary arthroplasty of the hip and knee: results of an observational cohort study in the Dutch Arthroplasty Register in 242,179 patients.	40
<b>Section 2</b>	<b>Finding the Evidence: Proceedings of International Consensus on Orthopedic Infections</b>	<b>64</b>
Chapter 4:	Hip and Knee Section, Treatment, Algorithm.	66
Chapter 5:	Hip and Knee Section, Treatment, Two-Stage Exchange.	82
<b>Section 3</b>	<b>The Functional Articulating Antibiotic-Loaded Hip Spacer</b>	<b>100</b>
Chapter 6:	Similar rate of infection eradication for functional articulating, prefabricated and custom-made spacers in 2-stage revision of the infected total hip: a literature review.	102
Chapter 7:	Improved Patient Reported Outcome and Infection Eradication Rate with Functional Articulating Spacers in Two-Stage Revision of the Infected Hip.	122
<b>Section 4</b>	<b>Treatment of Periprosthetic Joint Infection</b>	<b>138</b>
Chapter 8:	Two-Stage Revision Arthroplasty for Coagulase-Negative Staphylococcal Periprosthetic Joint Infection of the Hip and Knee.	140
Chapter 9:	Revision for culture-negative total knee arthroplasties, a case-control clinical evaluation of functional and patient reported outcome of two-stage revision versus one-stage revision.	154

Chapter 10: Summary and General Discussion	166
Chapter 11: Summary in Dutch / Nederlandse Samenvatting	176
Appendices: List of publications and presentations	188
Acknowledgments / Dankwoord	193
Curriculum Vitae	196

