

University of Groningen

The Enigma of the Fontan circulation

Wolff, Djoeke

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version

Publisher's PDF, also known as Version of record

Publication date:

2016

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Wolff, D. (2016). The Enigma of the Fontan circulation [Groningen]: Rijksuniversiteit Groningen

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

The Enigma of the Fontan Circulation

Djoeke Wolff

The research presented in this thesis was performed at the Department of Pediatric Cardiology, University of Groningen, University Medical Center Groningen, Groningen, The Netherlands.

Printing of this thesis was financially supported by Rijksuniversiteit Groningen, Universitair Medisch Centrum Groningen, Graduate School of Medical Sciences, Junior Scientific Master Class, Chipsoft B.V., Medis medical imaging systems B.V., Bracco Imaging Europe B.V., Therabel Pharma Nederland B.V., Pfizer B.V.

Financial support by the Dutch Heart Foundation for the publication of this thesis is gratefully acknowledged.

Copyright © 2016 D. Wolff.

The Enigma of the Fontan Circulation.

All rights reserved. No parts of this thesis may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without written permission of the author and the publisher holding the copyright of the published articles.

ISBN 978-90-367-8938-7 (Hard-copy)

ISBN 978-90-367-8937-0 (E-book)

Layout: www.proefschriftopmaak.nl

Printed by: Scholma Print & Media, Bedum



rijksuniversiteit
 groningen

The Enigma of the Fontan Circulation

Proefschrift

ter verkrijging van de graad van doctor aan de
Rijksuniversiteit Groningen
op gezag van de
rector magnificus prof. dr. E. Sterken
en volgens het besluit van het College voor Promoties.

De openbare verdediging zal plaatsvinden op

woensdag 29 juni 2016 om 12.45 uur

door

Djoeke Wolff

Geboren op 31 juli 1988

te Emmen

Promotores

Prof. dr. R.M.F. Berger

Prof. dr. T. Ebels

Copromotor

dr. J.P. van Melle

Promotiecommissie

Prof. dr. W. Helbing

Prof. dr. W. Budts

Prof. dr. F. Haas

De kunst en wetenschap ontmoeten elkaar in de nieuwsgierigheid naar het mysterie

(Naar Albert Einstein)

Table of contents

Chapter 1	General introduction	11
Chapter 2	The Fontan operation starts with the cavopulmonary shunt <i>JACC 2013;61(14):1550-1551</i> Trends in mortality (1975-2011) after one- and two stage Fontan surgery, including bidirectional Glenn through Fontan completion <i>Eur J Cardiothorac Surg 2014; 45(4): 602-609</i>	27
Chapter 3	The Fontan circulation over time: attrition or natural decline? <i>Submitted for publication</i>	49
Chapter 4	N-terminal pro brain natriuretic hormone in Fontan patients: heart failure or circulatory failure? <i>Eur J Heart Fail 2013;15(6):602-603</i> In the Fontan circulation, NT-proBNP serum level reflects circulatory performance more than intrinsic cardiac function <i>Submitted for publication</i>	69
Chapter 5	The Fontan circulation and the liver: A magnetic resonance diffusion-weighted imaging study <i>Int J Cardiol 2016; 202: 595-600</i>	93
Chapter 6	Intravoxel incoherent motion analysis of the liver of Fontan patients <i>Submitted for publication</i>	109
Chapter 7	Adverse pulmonary vascular remodeling in the Fontan circulation <i>J Heart Lung Transplant 2015;34(3):404-413</i>	125
Chapter 8	Quality of life and sexual wellbeing in patients with a Fontan circulation: an explorative pilot study <i>Submitted for publication</i>	145
Chapter 9	Surgical Options after Fontan Failure: the F2 study. A multi-center European Congenital Heart Surgeons Association (ECHSA) study <i>Heart 2016 (Epub ahead of print)</i>	165

Chapter 10	Favorable mid-term outcome after heart transplantation for late Fontan failure <i>Eur J Cardiovasc Surg</i> 2015;47(4):665-671	185
Chapter 11	General discussion	207
Appendices	Summary	221
	Samenvatting	229
	Dankwoord	237
	Curriculum Vitae	243

