



Universiteit
Leiden

The Netherlands

Aortic valve disease: multimodality imaging for risk stratification and evaluation of therapy

Vollema, E.M.

Citation

Vollema, E. M. (2022, September 6). *Aortic valve disease: multimodality imaging for risk stratification and evaluation of therapy*. Retrieved from <https://hdl.handle.net/1887/3455179>

Version: Publisher's Version

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/3455179>

Note: To cite this publication please use the final published version (if applicable).

AORTIC VALVE DISEASE

**MULTIMODALITY IMAGING FOR RISK STRATIFICATION AND
EVALUATION OF THERAPY**

Elise Mara VOLLEMA

The studies described in this thesis were performed at the Department of Cardiology of the Leiden University Medical Center, Leiden, The Netherlands.

Cover: Evelien Jagtman, © evelienjagtman.com

Lay-out: E.M. Vollema, F.E. Kalff, H.C. Kalff

Printed by: Gildeprint - Enschede

ISBN: 978-94-6419-547-7

Copyright © 2022 E.M. Vollema. All rights reserved. No part of this thesis may be reproduced, stored or transmitted in any way or by any means without the prior permission of the author, of when applicable, of the publishers of the scientific papers.

Financial support by Canon Medical Systems Nederland and ChipSoft b.v. for the publication of this thesis is gratefully acknowledged.

AORTIC VALVE DISEASE

MULTIMODALITY IMAGING FOR RISK STRATIFICATION AND
EVALUATION OF THERAPY

Proefschrift

ter verkrijging van
de graad van doctor aan de Universiteit Leiden,
op gezag van rector magnificus prof.dr.ir. H. Bijl,
volgens besluit van het college voor promoties
te verdedigen op dinsdag 6 september 2022
klokke 10.00 uur

door

Elise Mara VOLLEMA

geboren te 's-Gravenhage
in 1989

Promotor:

Prof. dr. J.J. Bax

Co-promotor:

Dr. V. Delgado

Leden promotiecommissie:

Prof. dr. M.J. Schalij

Dr. N. Ajmone Marsan

Dr. P.R.M. van Dijkman

Prof. dr. M.E.J. Reinders (Erasmus Medisch Centrum)

Prof. dr. P. van der Meer (Universitair Medisch Centrum Groningen)

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

Aan Floris. Aan mijn ouders.

CONTENTS

1	General introduction and outline of the thesis	1
I	Risk stratification and timing of intervention	11
2	Staging cardiac damage in patients with symptomatic aortic valve stenosis	13
3	Incremental value of left ventricular global longitudinal strain in a newly proposed staging classification based on cardiac damage in patients with severe aortic stenosis	41
4	Association of left ventricular global longitudinal strain with asymptomatic severe aortic stenosis: natural course and prognostic value	63
5	Prognostic implications of renal dysfunction in patients with aortic stenosis	81
6	Aortic valve calcium load: diagnostic and prognostic implications in aortic stenosis	95
II	Evaluation of therapy	101
7	Echocardiography in transcatheter aortic valve replacement	103
8	Transcatheter aortic valve thrombosis: the relation between hypo-attenuated leaflet thickening, abnormal valve hemodynamics, and stroke	131
9	Time course of left ventricular remodelling and mechanics after aortic valve surgery: aortic stenosis versus aortic regurgitation	153
III	Summary & appendices	169
10	Summary, conclusions and future perspectives	171
11	Samenvatting, conclusies en toekomstperspectieven	177
	List of publications	183
	Dankwoord	187
	Curriculum Vitæ	189

