

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/20407> holds various files of this Leiden University dissertation.

**Author:** Maas, Jacinta

**Title:** Mean systemic filling pressure : from Guyton to the ICU

**Date:** 2013-01-17

# Mean systemic filling pressure

from Guyton to the ICU

Jacinta Maas

ISBN: 978 - 90 - 9027060 - 9

Cover photo: beach at Burgh-Haamstede (Zeeland) by Jacinta Maas

Design cover by R.A.J.M. de Best and J. van Paassen

Printed by UFB /Grafische Producties, Leiden

© 2013, J.J. Maas, Leiden, The Netherlands

# Mean systemic filling pressure

from Guyton to the ICU

Proefschrift

ter verkrijging van  
de graad van Doctor aan de Universiteit Leiden,  
op gezag van Rector Magnificus prof. mr. P.F. van der Heijden,  
volgens besluit van het College voor Promoties  
te verdedigen op donderdag 17 januari 2013  
klokke 11.15 uur

door

Jacomina Johanna (Jacinta) Maas  
geboren te Hillegom  
in 1966

## **Promotiecommissie**

*Promotores:* Prof. Dr. E. de Jonge  
Prof. Dr. L.P.H.J. Aarts

*Co-promotor:* Dr. J.R.C. Jansen

*Overige leden:* Prof. Dr. A.B.J. Groeneveld (Erasmus Universiteit Rotterdam)  
Prof. Dr. J.G. van der Hoeven (Universiteit Nijmegen)  
Prof. Dr. R.J.M. Klautz

## Contents

Chapter 1	General introduction and outline of this thesis	7
Chapter 2	Bedside assessment of mean systemic filling pressure	25
Chapter 3	Assessment of venous return curve and mean systemic filling pressure in postoperative cardiac surgery patients	37
Chapter 4	Evaluation of mean systemic filling pressure from pulse contour cardiac output and central venous pressure	51
Chapter 5	Estimation of mean systemic filling pressure in postoperative cardiac surgery patients with three methods	65
Chapter 6	Arm occlusion pressure is a useful predictor of an increase in cardiac output after fluid loading following cardiac surgery	79
Chapter 7	Bedside assessment of total systemic vascular compliance, stressed volume and cardiac function curves in ICU patients	89
Chapter 8	Determination of vascular waterfall phenomenon by bedside measurement of mean systemic filling pressure and critical closing pressure in the ICU	107
Chapter 9	Partitioning the resistances along the vascular tree: effects of dobutamine and hypovolemia in piglets with an intact circulation	123
Chapter 10	Cardiac output response to norepinephrine in ICU patients: interpretation with venous return and cardiac function curves	137
Chapter 11	Final considerations and clinical implications	153
Chapter 12	Summary/Samenvatting	163
	Abbreviations	175

Curriculum Vitae	<i>177</i>
List of publications	<i>179</i>
Dankwoord	<i>181</i>