University of Groningen

Fixed dosing of Prothrombin Complex Concentrate

Abdoellakhan, Rahat

DOI:
[10.33612/diss.198281380](https://doi.org/10.33612/diss.198281380)

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:
2022

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

Citation for published version (APA):
Abdoellakhan, R. (2022). *Fixed dosing of Prothrombin Complex Concentrate: Unpersonalizing Medicine*. [Thesis fully internal (DIV), University of Groningen]. University of Groningen.
<https://doi.org/10.33612/diss.198281380>

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).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

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.

Fixed dosing of Prothrombin Complex Concentrate

Rahat Amadkhan Abdoellakhan

Fixed dosing of prothrombin complex concentrate

Rahat A. Abdoellakhan

Cover Art - Romano Molenaar

Layout and design - Concentric Media

Printing - Ipskamp Printing

Financial support for printing of this thesis was kindly provided by Prothya Biosolutions, CSL Behring, Pfizer, University of Groningen, Graduate School of Medical Sciences and Stichting tot bevordering van onderzoek en onderwijs op het gebied van haemostase, trombose en rheologie Groningen.

Copyright © 2022 Rahat Abdoellakhan

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, or when applicable, of the publishers of the scientific papers.

rijksuniversiteit
 groningen

Fixed dosing of Prothrombin Complex Concentrate

Unpersonalizing Medicine

Proefschrift

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

De openbare verdediging zal plaatsvinden op
woensdag 26 januari 2022 om 14.30 uur

door

Rahat Amadkhan Abdoellakhan

geboren op 20 april 1987
te Voorburg

Promotor

Prof. dr. K. Meijer

Copromotores

Dr. N. Khorsand

Dr. N.J.G.M. Veeger

Beoordelingscommissie

Prof. dr. P.M.L.A. van den Bemt

Prof. dr. F.W.G. Leebeek

Prof. dr. E.N. van Roon

Contents

Chapter 1	Introduction: all things you need to know about prothrombin complex concentrate	9
Chapter 2	Fixed versus variable dosing of prothrombin complex concentrate in vitamin K antagonist-related intracranial hemorrhage: a retrospective analysis	35
Chapter 3	Method agreement analysis and interobserver reliability of the ISTH proposed definitions for effective hemostasis in management of major bleeding	49
Chapter 4	Randomised controlled trial protocol to evaluate a fixed dose prothrombin complex concentrate against the variable dose in vitamin K antagonist related bleeding (PROPER3)	65
Chapter 5	Fixed versus variable dosing of prothrombin complex concentrate for bleeding complications of vitamin K antagonists – the PROPER3 Randomized Clinical Trial	79
Chapter 6	Adaptation of fixed prothrombin complex concentrate dosing for vitamin K antagonist-related bleeding in the Netherlands	101
Chapter 7	Clinical outcome of patients with a vitamin K antagonist-associated bleeding treated with prothrombin complex concentrate	115
Chapter 8	Emergencies on direct oral anticoagulants: management, outcomes, and laboratory effects of prothrombin complex concentrate	133
Chapter 9	Outcome of intracranial bleeding managed with prothrombin complex concentrate in patients on direct factor Xa inhibitors or vitamin K antagonists	159
Chapter 10	Summary, general discussion and future perspectives	175
Chapter 11	Supplementary appendices	195
	Nederlandse samenvatting	205
	Dankwoord	219
	About the author	225