# Manual for Risk Prediction in Vascular Surgery

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# Chapter 1

# About

This book is intended as an explanatory text to support the risk tool available at www.vascalc.org.

## 1.1 Usage

Each chapter here reflects a page of the risk tool that should outline a certain clinical scenario that requires a decision to be made. Each chapter will be broken down into sections that will outline the decision making and available evidence used to provide each presented risk prediction. This risk calculator is developed for the sole purpose of decision support and resuls should not superscede clinician and patient preference.

## 1.2 Methods

The initial algorithms included in this project were found through a literature search of available medical databases, bibliography reviews and referrals from content experts. Published algorithms were reviewed and included if they met the following inclusion criteria.

1. Input variables available and commonly collected in the pre-operative setting.
2. Outcome variable relevant to clinician and patient for decision making.
3. Full regression model with beta coefficients and intercept publicly available in publication or through contact with publication authors.

Available risk models were then reviewed and included based on their quality. Quality of risk model was determined according to published TRIPOD guidelines,Collins et al. [2015] prioritizing the following values:

1. Accuracy assessments, such as AUC, sensitivity or specificity assessments determined through internal and external validation.
2. Parsimonious input variable selection and clear description of variable definitions and manipulations.
3. Clearly described homogeneous patient population that aligns with the clinical question.
4. Transparent stakeholder engagement and algorithm development.

## 1.3 Feedback

For suggestions, comments or questions please submit an issue on our github page or send us an email.

# Chapter 2

# Abdominal Aortic Aneurysms (AAA)

The aim of this risk calculator is to assist in the management of patients with asymptomatic infrarenal aortic aneurysms found through screening or incidentally.

## 2.1 Input variables

### 2.1.1 Age

This describes the expected age of the patient at the time of the procedure. This is likely the same age as the patient at the time of the evaluation.

### 2.1.2 Sex

### 2.1.3 Race

## 2.2 30d Procedural Mortality

The model used for this risk prediction comes from the VSGNE published in 2015. Eslami et al. [2015]

## 2.3 Post Operative Myocardial Infarcation

# Chapter 3

# CLTI

The aim of this risk calculator is to assist in the management of patients with asymptomatic infrarenal aortica aneurysms found through screening or incidentally.

## 3.1 Input variables

## 3.2 Post-procedural mortality

## 3.3 Post operative myocardial infarction

# Chapter 4

# Carotid

The aim of this risk calculator is to assist in the management of patients presenting with carotid artery stenosis and determining the best management strategy.

## 4.1 Input Variables

## 4.2 5 year stroke risk

## 4.3 Post operative Myocardial Infarction

# Bibliography

Gary S Collins, Johannes B Reitsma, Douglas G Altman, and Karel Moons. Transparent reporting of a multivariable prediction model for individual prognosis or diagnosis (TRIPOD): The TRIPOD Statement. *BMC Medicine*, 13 (1):1, 2015. ISSN 1741-7015. doi: 10.1186/s12916-014-0241-z.

Mohammad H. Eslami, Denis Rybin, Gheorghe Doros, Jeffrey A. Kalish, and Alik Farber. Comparison of a vascular study group of new england risk prediction model with established risk prediction models of in-hospital mortality after elective abdominal aortic aneurysm repair. *Journal of Vascular Surgery*, 62(5):1125–1133.e2, Nov 2015. ISSN 07415214. doi: 10.1016/j.jvs.2015.06.051. URL https://linkinghub.elsevier.com/retrieve/pii/S0741521415012252.