TRIPOD Checklist: Prediction Model Development and Validation

Section	Item		Checklist description	Reported on Page Number/Line Number	Reported on Section/Paragraph
Title and abstract					
Title	1	D;V	Identify the study as developing and/or validating a multivariable prediction model, the target population, and the outcome to be predicted.	Page1 Line 1	Title
Abstract	2	D;V	Provide a summary of objectives, study design, setting, participants, sample size, predictors, outcome, statistical analysis, results, and conclusions.	Page2 Line 31	Abstract
Introduction					
Background and objectives	3a	D;V	Explain the medical context (including whether diagnostic or prognostic) and rationale for developing or validating the multivariable prediction model, including references to existing models.	Page3 Line 74	Section Introduction Paragraph 2
	3b	D;V	Specify the objectives, including whether the study describes the development or validation of the model or both.	Page4 Line 101	Section Introduction Paragraph 4
Methods					
Source of data	4a	D;V	Describe the study design or source of data (e.g., randomized trial, cohort, or registry data), separately for the development and validation data sets, ifapplicable.	Page4 Line 110	Section Method and materials Paragraph 1
	4b	D;V	Specify the key study dates, including start of accrual; end of accrual; and, if applicable, end of follow-up.	Page4 Line 114	Section Method and
Participants	5a	D;V	Specify key elements of the study setting (e.g., primary care, secondary care, general population) including number and location of centres.	Page5 Line 121	Section Method and materials Paragraph 2
	5b	D;V	Describe eligibility criteria for participants.	Page5 Line 125	Section Method and
	5c	D;V	Give details of treatments received, if relevant.	Page5 Line 122	Section Method and
Outcome	6a	D;V	Clearly define the outcome that is predicted by the prediction model, including how and when assessed.	Page7 Line 190	Section Results Paragraph 1
	6b	D;V	Report any actions to blind assessment of the outcome to be predicted.	Page13 Line 388	Section Discussion
Predictors	7a	D;V	Clearly define all predictors used in developing or validating the multivariable prediction model, including how and when they were measured.	Page7 Line 191	Section Results Paragraph 1
	7b	D;V	Report any actions to blind assessment of predictors for the outcome and other predictors.	Page13 Line 388	Section Discussion
Sample size	8	D;V	Explain how the study size was arrived at.	Page7 Line 201	Section Construction of

Missing data	9	D;V	Describe how missing data were handled (e.g., complete-case analysis, single imputation, multiple imputation) with details of any imputation method.	Page2 Line 38	Section Abstract Paragraph 2
Statistical analysis methods	10a	D	Describe how predictors were handled in the analyses.	Page6 Line 161	Section Method and materials
	10b	D	Specify type of model, all model-building procedures (including any predictor selection), and method for internal validation.	Page6 Line 168	Section Method and materials Paragraph 7
	10c	V	For validation, describe how the predictions were calculated.	Page6 Line 163	Section Method and materials
	10d	D;V	Specify all measures used to assess model performance and, if relevant, to compare multiple models.	Page6 Line 169	Section Method and materials
	10e	V	Describe any model updating (e.g., recalibration) arising from the validation, if done.	Page8 Line 216	Section Validation of IPGS score in multiple
Risk groups	11	D;V	Provide details on how risk groups were created, if done.	Page6 Line 166	Section Method and materials
Development vs. validation	12	V	For validation, identify any differences from the development data in setting, eligibility criteria, outcome, and predictors.	Page6 Line 158	Section Method and materials Paragraph 7
Results					
Participants	13a	D;V	Describe the flow of participants through the study, including the number of participants with and without the outcome and, if applicable, a summary of the follow-up time. A diagram may be helpful.	Page5 Line 122	Section Method and materials Paragraph 2
	13b	D;V	Describe the characteristics of the participants (basic demographics, clinical features, available predictors), including the number of participants with missing data for predictors and outcome.	Page5 Line 124	Section Method and materials Paragraph 2
	13c	V	For validation, show a comparison with the development data of the distribution of important variables (demographics, predictors and outcome).	Page33 Line 681	Section Supplementary Paragraph 3
Model development	14a	D	Specify the number of participants and outcome events in each analysis.	Page7 Line 184	Section Results Paragraph 1
	14b	D	If done, report the unadjusted association between each candidate predictor and outcome.	Page7 Line 192	Section Results Paragraph 1
Model specification	15a	D	Present the full prediction model to allow predictions for individuals (i.e., all regression coefficients, and model intercept or baseline survival at a given time point).	Page7 Line 191	Section Results Paragraph 1
	15b	D	Explain how to the use the prediction model.	Page2 Line 49	Section Abstract Paragraph 2
Model performance	16	D;V	Report performance measures (with CIs) for the prediction model.	Page2 Line 47	Section Abstract Paragraph 3
Model-updating	17	V	If done, report the results from any model updating (i.e., model specification, model performance).	Page7 Line 201	Section Construction of the IPGS in patients with
Discussion					
Limitations	18	D;V	Discuss any limitations of the study (such as nonrepresentative sample, few events per predictor, missing data).	Page13 Line 388	Section Discussion Paragraph 7

Interpretation	19a	V	For validation, discuss the results with reference to performance in the development data, and any other validation data.	Page9 Line 247	Section Evaluation of the predictive performance of the IRGS score in patients
	19b	D;V	Give an overall interpretation of the results, considering objectives, limitations, and results from similar studies, and other relevant evidence.	Page10 Line 293	Section Discussion Paragraph 1
Implications	20	D;V	Discuss the potential clinical use of the model and implications for future research.	Page11 Line 301	Section Discussion
Other information					
Supplementary information	21	D;V	Provide information about the availability of supplementary resources, such as study protocol, Web calculator, and data sets.	Page27 Line 652	Section Supplementary materials
Funding	22	D;V	Give the source of funding and the role of the funders for the present study.	Page15 Line 428	Section Funding

* Items relevant only to the development of a prediction model are denoted by D, items relating solely to a validation of a prediction model are denoted by V, and items relating to both are denoted D;V. We recommend using the TRIPOD Checklist in conjunction with the TRIPOD Explanation and Elaboration document.

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*As the checklist was provided upon initial submission, the page number/line number reported may be changed due to copy editing and may not be referable in the published version. In this case, the section/paragraph may be used as an alternative reference.