

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,	Page 1/Line 1-3	Title
Abstract	2	D;V	Provide a summary of objectives, study design, setting, participants, sample size, predictors, outcome, statistical analysis, results, and conclusions.	Page 2/Line 26-47	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.	Page 4/Line 73-92	Introduction section/Paragraph 1-2
	3b	D;V	Specify the objectives, including whether the study describes the development or validation of the model or both.	Page 4/Line 93-106	Introduction section/Paragraph 3
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, if applicable.	Page 4/Line 108-113	Methods section/Paragraph of "Data acquisition"
	4b	D;V	Specify the key study dates, including start of accrual; end of accrual; and, if applicable, end of follow-up.	Page 4/Line 108-113	Methods section/Paragraph of "Data acquisition"
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.	Page 4/Line 108-113	Methods section/Paragraph of "Data acquisition"
	5b	D;V	Describe eligibility criteria for participants.	Page 4/Line 108-113	Methods section/Paragraph of "Data acquisition"
	5c	D;V	Give details of treatments received, if relevant.	Page 4/Line 108-113	Methods section/Paragraph of "Data acquisition"

Outcome	6a	D;V	Clearly define the outcome that is predicted by the prediction model, including how and when assessed.	Page 6/Line 158-176	Methods section/Paragraph of "Development and verification of the circadian rhythm predictor (CR predictor) via machine learning algorithms "
	6b	D;V	Report any actions to blind assessment of the outcome to be predicted.	Page 6/Line 158-176	Methods section/Paragraph of "Development and verification of the circadian rhythm predictor (CR predictor) via machine learning algorithms "
Predictors	7a	D;V	Clearly define all predictors used in developing or validating the multivariable prediction model, including how and when they were measured.	Page 6/Line 158-176	Methods section/Paragraph of "Development and verification of the circadian rhythm predictor (CR predictor) via machine learning algorithms "
	7b	D;V	Report any actions to blind assessment of predictors for the outcome and other predictors.	Page 6/Line 158-176	Methods section/Paragraph of "Development and verification of the circadian rhythm predictor (CR predictor) via machine learning algorithms "
Sample size	8	D;V	Explain how the study size was arrived at.	Page 4/Line 108-113	Methods section/Paragraph of "Data acquisition"

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.	Page 4/Line 108-113	Methods section/Paragraph of "Data acquisition"
Statistical analysis methods	10a	D	Describe how predictors were handled in the analyses.	Page 6/Line 158-176; Page7/ Line 203-209	Methods section/Paragraph of "Development and verification of the circadian rhythm predictor (CR predictor) via machine learning algorithms "," Statistical analysis"
	10b	D	Specify type of model, all model-building procedures (including any predictor selection), and method for internal validation.	Page 6/Line 158-176	Methods section/Paragraph of "Development and
	10c	V	For validation, describe how the predictions were calculated.	Page 6/Line 158-176	Methods section/Paragraph of "Development and verification of the circadian rhythm predictor (CR predictor) via machine learning algorithms "
	10d	D;V	Specify all measures used to assess model performance and, if relevant, to compare multiple models.	Page 6-7/Line 177-194	Methods section/Paragraph of "Immunotherapeutic response and other drug sensitivity evaluation for CR predictor", "Construction of a CR predictor-based nomogram"
	10e	V	Describe any model updating (e.g., recalibration) arising from the validation, if done.	N/A	N/A
Risk groups	11	D;V	Provide details on how risk groups were created, if done.	Page 6/Line 158-176	Methods section/Paragraph of "
Development vs. validation	12	V	For validation, identify any differences from the development data in setting, eligibility criteria, outcome, and predictors.	Page 6/Line 158-176	Methods section/Paragraph of "Development and
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.	See "Supplementary Figure 10"	See "Supplementary Figure 10"
	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.	See supplementary materials for details	See supplementary materials for details
	13c	V	For validation, show a comparison with the development data of the distribution of important variables (demographics, predictors and outcome).	N/A	N/A

Model development	14a	D	Specify the number of participants and outcome events in each analysis.	Page 9/Line 300-328	Results section/ Paragraph "Construction and validation of Circadian rhythm predictor"
	14b	D	If done, report the unadjusted association between each candidate predictor and outcome.	Page 9/Line 300-328	Results section/ Paragraph "Construction and validation of Circadian rhythm predictor"
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).	Page 9/Line 300-328	Results section/ Paragraph "Construction and validation of Circadian rhythm predictor"
	15b	D	Explain how to use the prediction model.	Page 10/ Line 359-369	Results section/ Paragraph "Development of CR predictor-based nomogram model for individualized evaluation"
Model performance	16	D;V	Report performance measures (with CIs) for the prediction model.	Page 10/ Line 359-369	Results section/ Paragraph "Development of CR"
Model-updating	17	V	If done, report the results from any model updating (i.e., model specification, model performance).	N/A	N/A
Discussion					
Limitations	18	D;V	Discuss any limitations of the study (such as nonrepresentative sample, few events per predictor, missing data).	Page 12/ Line 437-442	Discussion section

Interpretation	19a	V	For validation, discuss the results with reference to performance in the development data, and any other validation data.	N/A	N/A
	19b	D;V	Give an overall interpretation of the results, considering objectives, limitations, and results from similar studies, and other relevant evidence.	Page 12/ Line 443-447	Conclusion section
Implications	20	D;V	Discuss the potential clinical use of the model and implications for future research.	Page 11-12/ Line 380-436	Discussion section
Other information					
Supplementary information	21	D;V	Provide information about the availability of supplementary resources, such as study protocol, Web calculator, and data sets.	Page 13/ Line 458	Data Availability section
Funding	22	D;V	Give the source of funding and the role of the funders for the present study.	Page 12/ Line 450-455	Funding section

* 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 copyediting and may not be referable in the published version. In this case, the section/paragraph may be used as an alternative reference.