

TRIPOD Checklist: Prediction Model Development and Validation

Section/Topic	Item	Checklist Item	Page
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.	1
Abstract	2	D;V Provide a summary of objectives, study design, setting, participants, sample size, predictors, outcome, statistical analysis, results, and conclusions.	2
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.	3
	3b	D;V Specify the objectives, including whether the study describes the development or validation of the model or both.	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.	4
	4b	D;V Specify the key study dates, including start of accrual; end of accrual; and, if applicable, end of follow-up.	4
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.	4
	5b	D;V Describe eligibility criteria for participants.	4
	5c	D;V Give details of treatments received, if relevant.	NA
Outcome	6a	D;V Clearly define the outcome that is predicted by the prediction model, including how and when assessed.	6
	6b	D;V Report any actions to blind assessment of the outcome to be predicted.	NA
Predictors	7a	D;V Clearly define all predictors used in developing or validating the multivariable prediction model, including how and when they were measured.	5,6
	7b	D;V Report any actions to blind assessment of predictors for the outcome and other predictors.	NA
Sample size	8	D;V Explain how the study size was arrived at.	6
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.	7
Statistical analysis methods	10a	D Describe how predictors were handled in the analyses.	7
	10b	D Specify type of model, all model-building procedures (including any predictor selection), and method for internal validation.	7
	10c	V For validation, describe how the predictions were calculated.	7
	10d	D;V Specify all measures used to assess model performance and, if relevant, to compare multiple models.	7
	10e	V Describe any model updating (e.g., recalibration) arising from the validation, if done.	NA
Risk groups	11	D;V Provide details on how risk groups were created, if done.	NA
Development vs. validation	12	V For validation, identify any differences from the development data in setting, eligibility criteria, outcome, and predictors.	NA
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.	NA
	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.	NA
	13c	V For validation, show a comparison with the development data of the distribution of important variables (demographics, predictors and outcome).	NA
Model development	14a	D Specify the number of participants and outcome events in each analysis.	NA
	14b	D If done, report the unadjusted association between each candidate predictor and outcome.	NA
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).	NA
	15b	D Explain how to use the prediction model.	NA
Model performance	16	D;V Report performance measures (with CIs) for the prediction model.	NA
Model-updating	17	V If done, report the results from any model updating (i.e., model specification, model performance).	NA
Discussion			
Limitations	18	D;V Discuss any limitations of the study (such as nonrepresentative sample, few events per predictor, missing data).	8
Interpretation	19a	V For validation, discuss the results with reference to performance in the development data, and any other validation data.	NA
	19b	D;V Give an overall interpretation of the results, considering objectives, limitations, results from similar studies, and other relevant evidence.	NA
Implications	20	D;V Discuss the potential clinical use of the model and implications for future research.	8,9
Other information			
Supplementary information	21	D;V Provide information about the availability of supplementary resources, such as study protocol, Web calculator, and data sets.	10,17
Funding	22	D;V Give the source of funding and the role of the funders for the present study.	10

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.

Supplemental file 2. Case report forms

Case report forms for CPSP after VATS

Preoperative potential predictors	
Age	
Sex	<input type="checkbox"/> Male <input type="checkbox"/> Female
BMI	
Smoking history	<input type="checkbox"/> Past <input type="checkbox"/> Current <input type="checkbox"/> Never
The age-adjusted Charlson Comorbidity Index	
The APAIS score (the first four items)	
The FRAIL scale score	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2
Preoperative pulmonary ventilation function	<input type="checkbox"/> Normal <input type="checkbox"/> Small airway dysfunction <input type="checkbox"/> Restrictive hypoventilation <input type="checkbox"/> Obstructive hypoventilation <input type="checkbox"/> Mixed hypoventilation
Intraoperative potential predictors	
Type of surgery	<input type="checkbox"/> Pneumonectomy <input type="checkbox"/> Lobectomy <input type="checkbox"/> Segmentectomy <input type="checkbox"/> Wedge resection <input type="checkbox"/> Biopsy <input type="checkbox"/> Explorative surgery
Analgesic regimen	<input type="checkbox"/> Nerve block <input type="checkbox"/> PCIA <input type="checkbox"/> Both <input type="checkbox"/> Neither
Duration of surgery	
Postoperative predictors	
Duration of chest tube drainage	
Prince-Henry scale score on POD1	
DN4 score on POD1	
Prince-Henry scale score on POD14	
DN4 score on POD14	

Outcome	
NRS score on POD90	
CPSP	<input type="checkbox"/> Yes <input type="checkbox"/> No

The age-adjusted Charlson Comorbidity Index

Weight	Comorbid Condition
1	Myocardial infarction, congestive heart failure, peripheral vascular disease, cerebral vascular disease, dementia, chronic obstructive pulmonary disease, connective tissue disease, ulcer disease, mild liver disease, diabetes
2	Hemiplegia, moderate/severe renal disease, diabetes with end-organ damage, any tumor, leukemia/lymphoma
3	Moderate/severe liver disease
6	Metastatic solid tumor, AIDS
1	For each decade over age 40 years, up to 4 points
Total	

AIDS=acquired immune deficiency syndrome.

The APAIS (the first four items)

Item	Score				
	1	2	3	4	5
1.I am worried about the anesthetic					
2.The anesthetic is on my mind continually					
3.I would like to know as much as possible about the anesthetic					
4.Iam worried about the procedure					
Total scores					

1: Not at all, 2: Somewhat, 3: Moderate, 4: Moderately high, 5: Extremely

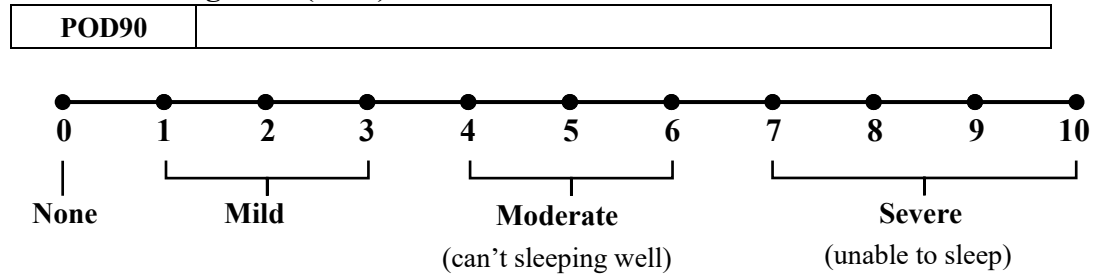
The FRAIL scale

Item	Question	Score
1.fatigue	How much of the time during the past 4 weeks did you feel tired? A=All or most B=Some, a little or none	<input type="checkbox"/> A=0 <input type="checkbox"/> B=1
2.resistance	In the past 4 weeks, by yourself and not using aids, do you have any difficulty walking up 10 steps without resting?	<input type="checkbox"/> Yes=1 <input type="checkbox"/> No=0
3.aerobic	In the past 4 weeks, by yourself and not using aids, do you have any difficulty walking 300 meters OR one block?	<input type="checkbox"/> Yes=1 <input type="checkbox"/> No=0
4.illness	Did your doctor ever tell you that you have? Hypertension; Diabetes; Cancer (not a minor skin cancer) Chronic lung disease; Heart attack; Congestive heart failure; Angina; Asthma; Arthritis; Kidney disease	<input type="checkbox"/> 0-4 answers=0 <input type="checkbox"/> 5-11 answers=1
5.loss of weight	Have you lost more than 5kg or 5% of your body weight in the past year?	<input type="checkbox"/> Yes =1 <input type="checkbox"/> No=0
Total scores	<input type="checkbox"/> ROBUST=0 <input type="checkbox"/> PRE-FRAIL=1-2 <input type="checkbox"/> FRAIL ≥3	

Prince-Henry scale

Severity of chest pain	Score	POD1	POD14
No pain on coughing	1	<input type="checkbox"/>	<input type="checkbox"/>
Pain on coughing or movement but not on deep breathing	2	<input type="checkbox"/>	<input type="checkbox"/>
Pain on deep breathing but not at rest	3	<input type="checkbox"/>	<input type="checkbox"/>
Slight pain at rest	4	<input type="checkbox"/>	<input type="checkbox"/>
Severe pain at rest	5	<input type="checkbox"/>	<input type="checkbox"/>

Numeric rating scale (NRS)



Douleur Neuropathique 4 questionnaire (the first seven items)

Does the pain have one or more of the following characteristics?		
<input type="checkbox"/>	Yes (1 point)	No (0 point)
Burning	<input type="checkbox"/>	<input type="checkbox"/>
Painful cold	<input type="checkbox"/>	<input type="checkbox"/>
Electric shocks	<input type="checkbox"/>	<input type="checkbox"/>
Is the pain associated with one or more of the following symptoms in the same area?		
<input type="checkbox"/>	Yes (1 point)	No (0 point)
Tinging	<input type="checkbox"/>	<input type="checkbox"/>
Pins and needles	<input type="checkbox"/>	<input type="checkbox"/>
numbness	<input type="checkbox"/>	<input type="checkbox"/>
itching	<input type="checkbox"/>	<input type="checkbox"/>
is the pain located in an area where the physical examination may reveal one or more of the following characteristics?		
<input type="checkbox"/>	yes	no
Hypoesthesia to touch	<input type="checkbox"/>	<input type="checkbox"/>
Hypoesthesia to pinprick	<input type="checkbox"/>	<input type="checkbox"/>
In the painful area, can the pain be caused or increased by		
<input type="checkbox"/>	yes	no
Brushing?	<input type="checkbox"/>	<input type="checkbox"/>
YES = 1 point; NO = 0 points		
Total scores ≥ 4 points is considered as neuropathic pain.		
Patient's Score: /10		