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Development and Validation of a Model to Predict Posttraumatic Stress Disorder and Major Depression After a Motor Vehicle Collision

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IMPORTANCE A substantial proportion of the 40 million people in the US who present to emergency departments (EDs) each year after traumatic events develop posttraumatic stress disorder (PTSD) or major depressive episode (MDE). Accurately identifying patients at high risk in the ED would facilitate the targeting of preventive interventions.

OBJECTIVES To develop and validate a prediction tool based on ED reports after a motor vehicle collision to predict PTSD or MDE 3 months later.

DESIGN, SETTING, AND PARTICIPANTS The Advancing Understanding of Recovery After Trauma (AURORA) study is a longitudinal study that examined adverse posttraumatic neuropsychiatric sequalae among patients who presented to 28 US urban EDs in the immediate aftermath of a traumatic experience. Enrollment began on September 25, 2017. The 1003 patients considered in this diagnostic/prognostic report completed 3-month assessments by January 31, 2020. Each patient received a baseline ED assessment along with follow-up self-report surveys 2 weeks, 8 weeks, and 3 months later. An ensemble machine learning method was used to predict 3-month PTSD or MDE from baseline information. Data analysis was performed from November 1, 2020, to May 31, 2021.

MAIN OUTCOMES AND MEASURES The PTSD Checklist for *DSM-5* was used to assess PTSD and the Patient Reported Outcomes Measurement Information System Depression Short-Form 8b to assess MDE.

RESULTS A total of 1003 patients (median [interquartile range] age, 34.5 [24-43] years; 715 [weighted 67.9%] female; 100 [weighted 10.7%] Hispanic, 537 [weighted 52.7%] non-Hispanic Black, 324 [weighted 32.2%] non-Hispanic White, and 42 [weighted 4.4%] of non-Hispanic other race or ethnicity were included in this study. A total of 274 patients (weighted 26.6%) met criteria for 3-month PTSD or MDE. An ensemble machine learning model restricted to 30 predictors estimated in a training sample (patients from the Northeast or Midwest) had good prediction accuracy (mean [SE] area under the curve [AUC], 0.815 [0.031]) and calibration (mean [SE] integrated calibration index, 0.040 [0.002]; mean [SE] expected calibration error, 0.039 [0.002]) in an independent test sample (patients from the South). Patients in the top 30% of predicted risk accounted for 65% of all 3-month PTSD or MDE, with a mean (SE) positive predictive value of 58.2% (6.4%) among these patients at high risk. The model had good consistency across regions of the country in terms of both AUC (mean [SE], 0.789 [0.025] using the Northeast as the test sample and 0.809 [0.023] using the Midwest as the test sample) and calibration (mean [SE] integrated calibration index, 0.048 [0.003] using the Northeast as the test sample and 0.024 [0.001] using the Midwest as the test sample; mean [SE] expected calibration error, 0.034 [0.003] using the Northeast as the test sample and 0.025 [0.001] using the Midwest as the test sample). The most important predictors in terms of Shapley Additive Explanations values were symptoms of anxiety sensitivity and depressive disposition, psychological distress in the 30 days before motor vehicle collision, and peritraumatic psychosomatic symptoms.

CONCLUSIONS AND RELEVANCE The results of this study suggest that a short set of questions feasible to administer in an ED can predict 3-month PTSD or MDE with good AUC, calibration, and geographic consistency. Patients at high risk can be identified in the ED for targeting if cost-effective preventive interventions are developed.

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Supplemental content

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Adverse posttraumatic neuropsychiatric sequelae (APNS) of traumatic experiences have a substantial societal burden.[1,2] Although posttraumatic stress disorder (PTSD) is the most frequently studied APNS, major depressive episode (MDE) is also common.[3,4] Many people who develop these APNS are evaluated in emergency departments (EDs) shortly after their traumas,[5-7] making preventive interventions possible.[8] Although theory and some preliminary empirical studies suggest that certain preventive interventions might be effective for at least some of these patients,[6] this area of research is underdeveloped. Although even before developing and evaluating preventive interventions, it would be useful to know how well we can pinpoint patients at high risk among the 40 million Americans who present annually to EDs after a trauma[9] given that it would likely be cost-effective to provide preventive interventions only to patients at high risk.

Several previous studies[10-16] attempted to develop machine learning (ML) models to predict PTSD among patients presenting to EDs after traumas. These models had good accuracy in terms of area under the receiver operating characteristic curve (AUC) predicting PTSD at 3 months (AUC, 0.79-0.85)[13,14] and 12 to 15 months (AUC, 0.71)[10,16] after trauma exposure and persistent PTSD (AUC, 0.75-0.89).[10-12,15] However, all of these studies[10-16] focused on the approximately 5% of patients with trauma who were hospitalized.[17] The APNS prevalence is equally high among the 95% of patients with trauma who are discharged.[18]

We present the results of an analysis based on the Advancing Understanding of Recovery After Trauma (AURORA) study, a longitudinal study of the onset and course of APNS among patients presenting to an ED after a traumatic experience. We included patients discharged from the ED and those hospitalized up to 72 hours.[18] We focused on motor vehicle collisions (MVCs), the most common trauma in industrialized countries[19] and in AURORA. We developed a model to predict PTSD or MDE 3 months after the ED visit compared with the exclusive focus on PTSD in prior studies.[10-16] Although previous studies[10-16] were limited to data from patients in 1 or 2 EDs, we used data from patients in 28 EDs. We trained the model using data from patients in EDs in the Midwest and Northeast and tested the model using data from patients in EDs in the South. The predictors considered were a mix of observations (eg, patient sex and race/ethnicity), standard clinical evaluations (eg, injury site and severity and vital signs), and patient reports. Although previous studies[10-16] used up to 105 predictors in their models, we aimed to develop a parsimonious model with a small number of predictors that could feasibly be administered in EDs.

Key Points

Question Is it possible to predict which patients will have posttraumatic stress disorder (PTSD) or major depressive episode (MDE) 3 months after presenting to an emergency department (ED) because of a motor vehicle collision?

Findings In this cohort study of 1003 patients evaluated in 28 US EDs, a machine learning model restricted to 30 variables found good validated area under the curve and calibration in predicting 3-month PTSD or MDE. The 30% of patients with highest predicted risk accounted for 65% of all 3-month PTSD or MDE.

Meaning These results suggest that patients at high risk can be identified in the ED for targeting if cost-effective preventive interventions are developed.

Methods

Sample

AURORA enrollment began on September 25, 2017. The patients considered in this report completed 3-month assessments by January 31, 2020, at 28 urban EDs across 3 US regions (Midwest, Northeast, and South). Patients had to be 18 to 75 years of age, presenting within 72 hours of the MVC, able to speak and read English, oriented to time and place, able to comprehend the enrollment protocol, and possessing a smartphone for more than 1 year. We excluded patients with a solid organ injury of grade 1 or higher, significant hemorrhage, or need for a chest tube or operation with general anesthesia. We initially excluded patients likely to be admitted but subsequently relaxed that exclusion to include patients admitted for no more than 24 hours (as of April 4, 2018) and then for no more than 72 hours (as of December 11, 2018). A predictor variable distinguishing those admitted vs discharged was included in the analysis. All participants provided written informed consent. All data were deidentified. This study was approved by institutional review boards at each participating institution. The study followed the Transparent Reporting of a Multivariable Prediction Model for Individual Prognosis or Diagnosis (TRIPOD) reporting guideline[20] for reporting analyses designed to develop and validate predictive models.

Patients self-reported their race by selecting one or more of the following categories: American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Pacific Islander, White, or any other race. To assess Hispanic ethnicity, patients were asked "Do you consider yourself to be of Hispanic, Latino, or Spanish origin." Using these two variables, we created a race and ethnicity variable with 4 categories, assigned in the following order: Hispanic, non-Hispanic White, non-Hispanic Black, non-Hispanic other.

Each patient received an interviewer-administered ED assessment with self-report questions and biological sample collections described elsewhere.[18] Subsequent 2-week, 8-week, and 3-month web surveys were sent by text or email for self-completion or with telephone interviewer assistance. Patients were reimbursed $60 for the ED assessment and $40 for each follow-up survey. Of the 2096 patients presenting after an MVC and completing the baseline assessment, 1003 completed all 3 follow-up surveys (eFigure in the Supplement). We focus on these 1003 patients. An inverse probability weight was used to adjust for differences in baseline measures between these 1003 patients and those in the baseline sample who missed at least 1 follow-up.[21]

Measures

We included 394 potential predictors that spanned 11 broad APNS risk factor domains that included MVC characteristics,

peritraumatic signs and symptoms, chronic stressors, prior lifetime traumas, past 30-day psychological distress, physical health, past 30-day role impairment, lifetime mental disorders, sociodemographic characteristics, social support, and personality. A detailed list of constructs, measures, and scoring rules is presented in eTable 1 in the Supplement. Categorical variables were dummy coded. Quantitative variables were standardized to a mean of 0 and variance of 1 for use in linear algorithms and transformed into deciles for use in tree-based algorithms.

Outcome

The outcome for the prediction model was self-reported PTSD or MDE during a 30-day recall period assessed in the 3-month survey. Posttraumatic stress disorder was assessed with the 20-item PTSD Checklist for *DSM-5*[22] Of the several diagnostic classification rules proposed for the PTSD Checklist,[23,24] we selected a conservative threshold of 38 or higher. Major depressive episode was assessed with the Patient Reported Outcomes Measurement Information System Depression Short-Form 8b.[25] Patients were classified as meeting 3-month criteria for MDE if their scores were 30 or higher, which is 1.65 SDs above the established general population mean based on the conservative assumption that 5% of the general population meets the criteria for MDE. The outcome was defined as positive if the patient met 3-month criteria for PTSD and/or MDE. We also assessed 3-month role impairment using a modified version of the Sheehan Disability Scale[26] and the World Health Organization Disability Assessment Schedule[27] question about days totally out of role because of health problems in the past 30 days (eTable 1 in the Supplement).

Statistical Analysis

Data analysis was performed from November 1, 2020, to May 31, 2021. Patients had to complete all 3 follow-up assessments (2-week, 8-week, and 3-month assessments) because some predictors, although referring to experiences or patient characteristics before the MVC, were assessed in the 2-week or 8-week surveys to reduce patient burden in the ED. We treated the 2- and 8-week measures as if assessed at baseline. We used mean imputation for the small amount of item-missing data. To account for potential selection bias from nonresponse in follow-up surveys, we used inverse probability of response weights to adjust for the modest differences found between baseline characteristics of patients in the analysis sample and patients who did not complete at least 1 follow-up assessment.[21] All analyses were performed in this weighted data set. Weighted means of baseline variables in the analysis sample were all within 0.1 SD of the means in the total baseline sample (eTable 2 in the Supplement).

Substantive analysis began by comparing prevalence, comorbidity, and role impairments of PTSD and MDE at 3 months using 2-sided χ^2 and *F* tests. We then developed an ML model to predict 3-month PTSD or MDE from the baseline variables. We used a stacked generalization method in which results were pooled across multiple algorithms by generating an algorithm weight via 10-fold cross-validation in a training sample for each algorithm in the set we used (ensemble). The composite predicted outcome score is guaranteed in expectation to perform at least as well as the best component algorithm according to a prespecified criterion, which we defined as AUC.[28] The Super Learner ensemble ML method was used to implement this analysis.[29] Consistent with recommendations,[30,31] we used a diverse set of algorithms in the Super Learner ensemble to capture nonlinearities and interactions and reduce risk of misspecification.[32] These algorithms included several different linear algorithms (logistic regression, regularized regression, spline and polynomial spline regressions, and support vector machines) and regression tree-based algorithms (boosting and bagging ensemble trees and bayesian additive regression trees) (eTable 3 in the Supplement). Broadly similar stacking approaches have been used in prior ED research on PTSD[15] as well as in other computational psychiatric research studies.[33,34] Given the small sample size, hyperparameter tuning was achieved by including individual algorithms multiple times in the ensemble with different hyperparameter values and allowing Super Learner to weight relative importance across this range rather than using an external grid search or random search procedure.

Feature selection was performed independently in each 10-fold cross-validation training sample. We explored 2 different feature reduction methods, least absolute shrinkage and selection operator (LASSO) penalized regression[35] and random forest,[36] to increase feasibility of implementation in clinical practice and to reduce overfitting. The training sample was defined as the 784 patients in the Northeast or Midwest and the test sample as the 219 patients in the South. Model fit across specifications was evaluated in the test sample based on AUC. Once a best-model specification was determined, we used a locally estimated scatterplot smoothed calibration curve[37] to quantify calibration of predicted outcome probabilities using the integrated calibration index (ICI) and expected calibration error (ECE).[38,39] We additionally examined how the best-model specification would perform in terms of AUC and calibration in alternative test samples (ie, if the test samples were instead the Northeast or Midwest). We then divided the test sample into 20 ventiles of predicted risk defined in the training sample and calculated conditional and cumulative sensitivity (the proportion of patients with the outcome) and positive predictive value (PPV; prevalence of the outcome) in the test sample within and across these predicted risk ventiles. Model fairness, defined as whether model performance was comparable across important segments of the population,[40] was examined by estimating variation in the association of predicted risk with the observed outcome across subgroups defined by several key patient sociodemographic characteristics (age, sex, race/ethnicity, and income) using a robust Poisson regression model.[41] We examined predictor importance with the model-agnostic Kernel SHAP (Shapley Additive Explanations) method, which estimates the marginal contribution to overall model accuracy of each variable in a predictor set.[42] A 2-sided $P < .05$ was considered to be statistically significant.

Data management and calculations of prevalence and AUC were performed in SAS statistical software, version 9.4 (SAS Institute Inc).[43] The Super Learner models were estimated in R, version 3.6.3 (R Foundation for Statistical Computing).[44]

SHAP values were estimated in Python, version 3.8.5 (Python Software Foundation).[45] The R packages used for each algorithm are listed in eTable 3 in the Supplement.

Results

Prevalence of 3-Month PTSD or MDE

A total of 1003 patients (median [interquartile range] age, 34.5 [24-43] years; 715 [weighted 67.9%] female; 100 [weighted 10.7%] Hispanic, 537 [weighted 52.7%] non-Hispanic Black, 324 [weighted 32.2%] non-Hispanic White, and 42 [weighted 4.4%] of non-Hispanic other race or ethnicity were included in this study. The 3-month prevalence (SE) was 25.1% (1.4) for PTSD, 11.5% (1.0) for MDE, and 26.6% (1.4) for either (eTable 4 in the Supplement). These prevalence (SE) estimates were not markedly different from those reported retrospectively in the ED for the 30 days before MVC: 20.7% (1.3) for PTSD, 6.2% (0.8) for MDE, and 22.3% (1.3) for either. However, as noted below, our best model substantially outperformed a model using only pre-MVC PTSD and MDE to predict the 3-month outcome.

Even though 3-month MDE alone was much less common than PTSD alone (1.6% vs 15.1%; $\chi^2_1 = 11.1$; $P < .001$), the mean (SE) number of days out of role was significantly higher among patients with comorbid PTSD and MDE than among patients with PTSD alone (6.0 [0.8] vs 3.8 [0.7], $F_1 = 4.1$, $P = .04$). In addition, the mean (SE) number of days out of role was substantially higher, although not significantly so, among the small number of patients with MDE alone than those with PTSD alone (7.6 [2.9] vs 3.8 [0.7]; $F_1 = 1.6$; $P = .21$). Broadly similar results were found for patient reports of severe role impairment (eTable 5 in the Supplement). On the basis of these results, we defined our outcome as 3-month PTSD and/or MDE rather than focusing only on PTSD. The prevalence (SE) of this outcome was comparable across the 3 regions where AURORA was performed: Northeast (n [number of patients in the region] = 352; 26.5% [percentage of those patients] [2.4]), Midwest (n = 432; 26.8% [2.2]), and South (n = 219; 26.6% [3.1]).

Model Performance

The mean (SE) AUC of the initial Super Learner model in the test sample was 0.803 (0.032) when only LASSO was used for feature selection and 0.782 (0.034) when both LASSO and ranger were used for feature selection. The AUC in the test sample was 0.663 (0.037), in comparison, when pre-MVC PTSD and MDE were the only predictors in a logistic regression model that allowed for interactions between these 2 predictors. On the basis of these results, we focused further analysis on restricted models that used only LASSO for feature selection and examined models restricted to 10 to 50 predictors. The AUC was higher in models restricted to 20, 30, or 50 predictors (mean [SE] AUC, 0.810 [0.032] for models with 20 predictors, 0.815 [0.031] for models with 30 predictors, and 0.810 [0.032] for models with 50 predictors) than the model with unrestricted predictors (mean [SE] AUC, 0.803 [0.032]) (**Figure 1**).

Given that the 30-predictor model had a marginally higher AUC than the others, we focused on it for further evaluation as our best model. This model had good calibration in the test sample (mean [SE] ICI, 0.040 [0.002]; mean [SE] ECE, 0.039 [0.002]). Five of the 32 algorithms in the model's ensemble accounted for almost all the Super Learner weight: 2 of the 5 extreme gradient boosting algorithms (0.32-0.38 weights), 1 of the 3 random forest algorithms (0.18 weight), and 2 of the 11 penalized logistic regression algorithms (0.01-0.11 weights) (eTable 6 in the Supplement). The mean (SE) 30-predictor model AUC in the total test sample was 0.815 (0.031). The mean (SE) AUC was 0.709 (0.067) among patients who met criteria for PTSD and/or MDE in the 30 days before MVC and 0.791 (0.046) among patients who did not meet the pre-MVC criteria for either disorder. Fairness of the model was documented by finding that the relative risk of the outcome based on predicted probabilities from the model was comparable across test sample subgroups defined by age, sex, race/ethnicity, and income (eTable 7 in the Supplement). Geographic consistency of model performance was documented by finding comparable AUC (mean [SE] AUCs, 0.789 [0.025] using the Northeast as the test sample and 0.809 [0.023] using the Midwest as the test sample) (**Figure 2**) and calibration (mean [SE] integrated calibration index, 0.048 [0.003] using the Northeast as the test sample and 0.024 [0.001] using the Midwest as the test sample; mean [SE] ECE, 0.034 [0.003] using the Northeast as the test sample and 0.025 [0.001] using the Midwest as the test sample) (**Figure 3**) when the test sample was changed to be patients in the Northeast or Midwest.

Inspection of model sensitivity and PPV found that, despite some nonmonotonicity, patients in the top 5 predicted training sample risk ventiles, which included 29.9% of the test sample, had sensitivities between 1.7 and 2.8 times the value expected by chance, whereas remaining patients had sensitivities near (ventiles 5-10) or below (ventiles 11-20) expected

Figure 1. Area Under the Receiver Operating Characteristic Curves (AUCs) in the Test Sample (n = 219) Predicting 3-Month Posttraumatic Stress Disorder or Major Depressive Episode Based on Super Learner Models With Restricted and Unrestricted Least Absolute Shrinkage and Selection Operator Feature Selection Estimated in the Training Sample (n = 784)

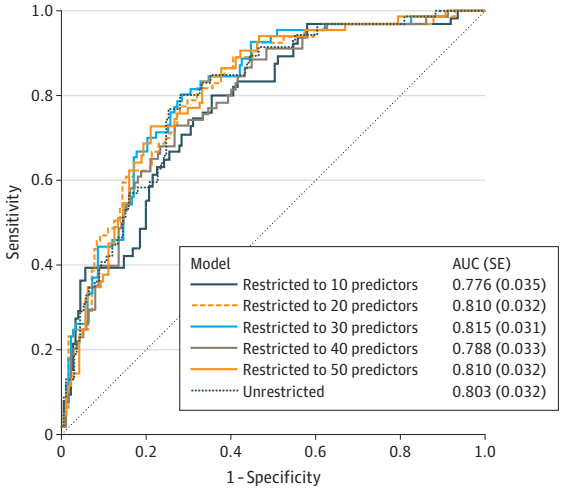
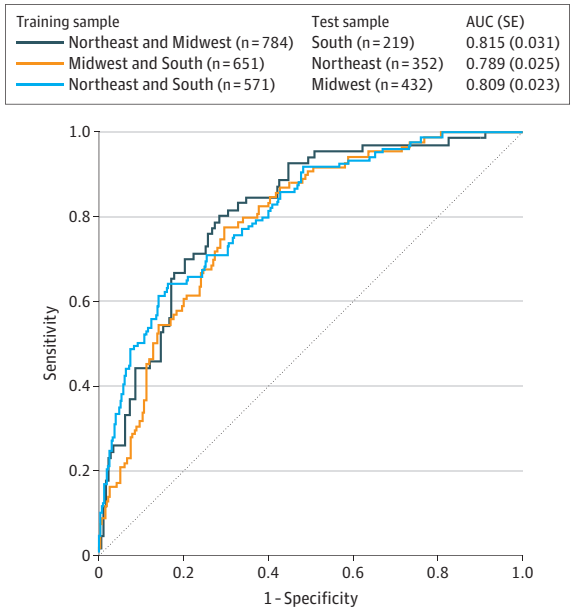


Figure 2. Area Under the Receiver Operating Characteristic Curves (AUCs) in Alternative Test Samples Defined by Census Region Predicting 3-Month Posttraumatic Stress Disorder or Major Depressive Episode Based on Super Learner Models With Least Absolute Shrinkage and Selection Operator Feature Selection Restricted to 30 Predictors

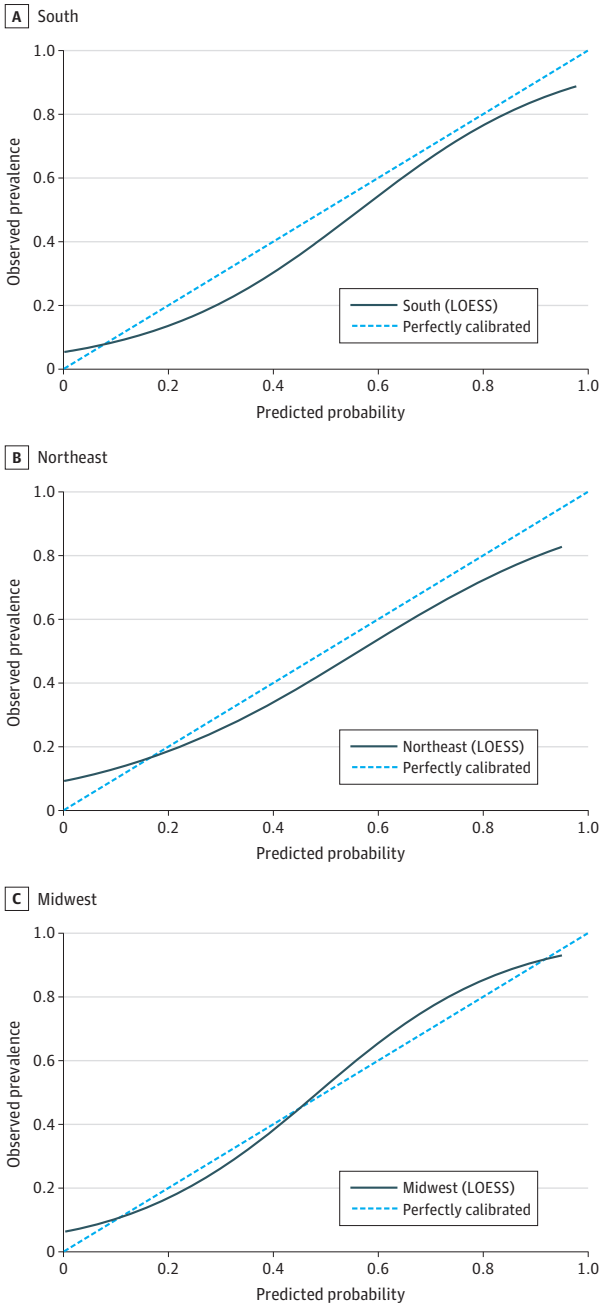


values (**Table**). Cumulative sensitivity across the top 5 ventiles was 65.4%, and the cumulative PPV in that range was 58.2%.

Predictor Importance

A total of 264 of the 394 variables (67%) in the predictor set had zero-order associations with the outcome in the total sample, including 94% to 100% of those assessing 30 days before MVC psychological distress and impairment and recent stressors; 70% to 85% of those assessing peritraumatic symptoms, social support, and personality; 50% to 60% of those assessing lifetime traumas and mental disorders and physical health; and 25% to 30% of those assessing sociodemographic and MVC characteristics (eTable 8 in the Supplement). Admission status (ie, admitted to the hospital vs discharged) was not a significant zero-order predictor (odds ratio, 1.0; 95% CI, 0.9-1.1). To examine predictor importance, we reran the best model specification (ie, 30 predictors selected by LASSO separately for linear and tree-based algorithms) in the total sample. A total of 53 predictors were selected (30 each for linear and tree-based models, with an overlap of 7 predictors), which came from 40 variables (ie, 13 were alternative transformations of the same variable) (eTable 1 in the Supplement). The 20 most important predictors accounted for 75.5% of the total mean absolute SHAP value across all predictors in the model (**Figure 4**). These predictors included 7 indicators of personality (6 of anxiety sensitivity and 1 of dispositional depression), 7 of peritraumatic psychosomatic symptoms, 4 of past 30-day psychological symptoms (2 depression, 1 PTSD, and 1 impairment attributable to emotional problems), and 2 of prior lifetime trauma exposure. The personality measures were among those

Figure 3. Locally Estimated Scatterplot Smoothing (LOESS) Calibration Curves for Predicted Probability of 3-Month Posttraumatic Stress Disorder or Major Depressive Episode in Alternative Test Samples Defined by Census Region Based on Super Learner Models With Least Absolute Shrinkage and Selection Operator Feature Selection Restricted to 30 Predictors



The smoothing span is 0.75, the integrated calibration index is 0.024 to 0.0409, and the expected calibration error is 0.025 to 0.039.

assessed retrospectively in the 2-week follow-up survey. Replication of the Super Learner with LASSO feature selection of 30 predictors from a reduced predictor set that excluded retrospectively reported variables (ie, lifetime traumatic experiences) had a lower AUC in analyses sequentially treating

Table. Prediction of Posttraumatic Stress Disorder or Major Depressive Episode 3 Months After a Motor Vehicle Collision in the Test Sample of 219 Patients From the South by Ventiles of the Predicted Risk Distribution in the Training Sample of 784 Patients From the Northeast and Midwest Using the Super Learner Model With LASSO Feature Selection Restricted to 30 Predictors

Ventile	Total No. of patients	Within ventile			Cumulative		
		Patients, %	Sensitivity, mean (SE)	PPV, mean (SE)	Patients, %	Sensitivity, mean (SE)	PPV, mean (SE)
1	11	4.7	13.1 (12.5)	74.2 (13.1)	4.7	13.1 (4.4)	74.2 (13.1)
2	9	4.3	11.4 (11.1)	70.4 (15.4)	9.0	24.5 (6.0)	72.4 (10.0)
3	14	6.5	12.5 (12.0)	51.0 (13.7)	15.5	36.9 (6.6)	63.4 (8.5)
4	20	10.0	17.3 (15.6)	45.8 (11.4)	25.6	54.2 (6.6)	56.5 (7.0)
5	10	4.4	11.2 (10.9)	68.2 (15.4)	29.9	65.4 (6.2)	58.2 (6.4)
6	18	8.0	7.6 (7.7)	25.4 (10.2)	37.9	73.0 (5.8)	51.3 (5.7)
7	9	3.5	5.6 (5.8)	42.8 (16.6)	41.4	78.6 (5.4)	50.6 (5.4)
8	12	5.4	4.7 (4.9)	23.1 (12.0)	46.8	83.3 (5.0)	47.4 (5.1)
9	17	8.4	5.4 (5.6)	17.0 (9.5)	55.2	88.7 (4.1)	42.8 (4.7)
10	12	5.7	4.0 (4.2)	18.6 (11.8)	60.9	92.7 (3.2)	40.5 (4.4)
11	7	3.3	2.8 (3.0)	22.8 (14.9)	64.2	95.5 (2.6)	39.6 (4.3)
12	19	9.4	1.4 (1.5)	4.0 (4.0)	73.7	96.9 (2.2)	35.0 (3.9)
13	13	5.7	0	0	79.4	96.9 (2.2)	32.5 (3.7)
14	4	1.6	0	0	81.0	96.9 (2.2)	31.9 (3.6)
15	7	3.0	0	0	84.0	96.9 (2.2)	30.7 (3.5)
16	9	4.1	1.8 (1.9)	11.5 (11.0)	88.1	98.7 (1.3)	29.8 (3.4)
17	10	4.2	0	0	92.4	98.7 (1.3)	28.4 (3.3)
18	4	1.6	1.3 (1.4)	22.4 (20.7)	93.9	100.0	28.3 (3.2)
19	3	1.3	0	0	95.2	100.0	28.0 (3.2)
20	11	4.8	0	0	100.0	100.0	26.6 (3.1)

Abbreviations: LASSO, least absolute shrinkage and selection operator; PPV, positive predictive value.

patients in 2 regions as the training sample and those in the third region as the test sample (AUC [SE], 0.815 [0.031] using the South as the test sample, 0.789 [0.025] using the Northeast as the test sample, and 0.809 [0.023] using the Midwest as the test sample) than when the retrospectively reported variables were included (AUC [SE], 0.755 [0.035] using the South as the test sample, 0.748 [0.031] using the Northeast as the test sample, and 0.754 [0.027] using the Midwest as the test sample).

Discussion

In this study, our model's AUC was comparable to models developed in previous ED studies to predict persistent PTSD,[10-12,15] 3-month PTSD,[13,14] or 12- to 15-month PTSD.[10,16] However, these other studies[10-16] used up to 105 predictors vs 40 in our model, and many of the most important predictors in prior studies[15,16] were laboratory tests that are routinely performed only for patients with trauma admitted to the hospital, which do not apply to the approximately 95% of ED patients discharged to home. The external validity of earlier models was also limited by their inclusion of only 1 or 2 EDs. In addition, whereas our model was well calibrated, only 1 previous study[15] examined calibration and found it to be relatively poor.

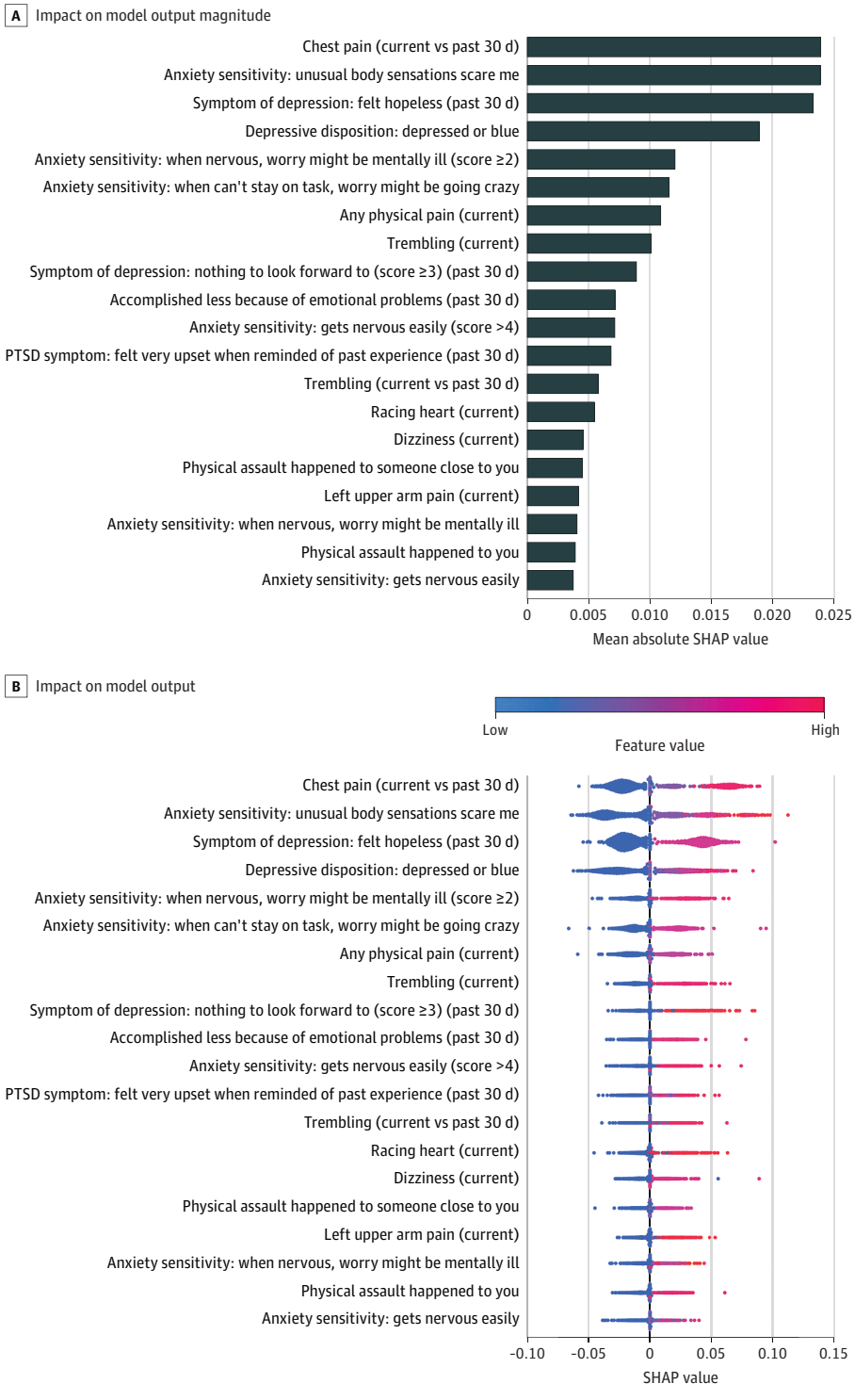
Caution is needed in interpreting our findings regarding predictor importance because this depends on associations of predictors with each other. It is nonetheless interesting that items assessing dispositional anxiety sensitivity emerged as the most important predictors. Such measures were not included in previous studies.[10-16] The other 2 most important predictor domains in our model were peritraumatic psychosomatic symptoms in the ED and psychological distress. Only 2 prior studies assessed psychological distress in the weeks[13] or months[14] before trauma exposure. Both found that these were important predictors. Although no prior study assessed peritraumatic psychosomatic symptoms, some assessed peritraumatic distress[10,12,14,15] and dissociation[14,15] and found both to be important predictors. Consistent with these prior results, we found that peritraumatic distress and dissociation were significant univariate predictors of our outcome, although they were not selected in the final model.

It is also important to recognize that the value of our model depends on unknowns about the costs and effects of preventive interventions. As noted above, this is an underdeveloped area of research.[6] Determining whether the PPV of our model at a decision threshold is sufficiently high to justify implementing a targeted intervention would, at a minimum, require an evaluation of the precision recall curve and, importantly, the net benefit curve[46] based on a formal cost-effectiveness analysis. In addition, if heterogeneity of treatment effects is found, the development of an individualized precision treatment rule would be required to evaluate the effects of our prediction model.[47]

Limitations

Our study has several noteworthy limitations. First, the sample included only English-speaking patients from urban EDs after

Figure 4. Predictor Importance Determined by Shapley Additive Explanations (SHAP) Values for the Super Learner Model With Least Absolute Shrinkage and Selection Operator Feature Selection Restricted to 30 Predictors



The bar chart shows the mean absolute SHAP values for the top 20 predictors. Larger SHAP values indicate greater importance for predicting 3-month posttraumatic stress disorder (PTSD) or major depressive episode. The SHAP heat map displays the SHAP values for each of the top 20 predictors sorted by their global importance (with more important predictors at the top). Each dot represents an individual's SHAP value for that predictor. The value of each individual's predictor ranges from low (blue) to high (red), and its corresponding SHAP value (the mean absolute value change in predicted probability of the outcome associated with the variable) is also shown.

an MVC who were followed up for 3 months. Different samples and follow-up periods might yield different results. Second, the response rate was low, raising the possibility of sample selection bias. Third, patients with pre-MVC PTSD and MDE were not excluded, although our AUC was substantially higher than in a model in which 30-day pre-MVC PTSD and MDE were the only predictors, and only 3 of our top 20 predictors were symptoms of 30-day pre-MVC PTSD or MDE. Fourth, we did not consider

the small number of patients who were hospitalized for more than 72 hours. We also did not obtain information about outpatient treatment after ED discharge. These omissions could have reduced the external validity by excluding otherwise important baseline variables with effects on 3-month outcomes mediated by treatment. Fifth, outcome measures were based on validated self-report scales rather than clinical interviews.[22,25] Sixth, some important predictors were assessed in the 2-week surveys, and overall model prediction accuracy was lower when these variables were omitted from the model. Replication in a sample that assesses these variables at baseline will be needed to determine their true importance.

Conclusion

This study found that a parsimonious model that predicts 3-month PTSD or MDE after MVC can be developed using a battery of questions that could be delivered in approximately 10 minutes. The model had good AUC and calibration and captured close to two-thirds of all patients who developed 3-month PTSD or MDE in the top 30% of the predicted risk distribution. These results suggest that if cost-effective preventive interventions are developed, identification of patients in the ED who are at high risk for treatment targeting may be possible.

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Supplementary Online Content

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This supplementary material has been provided by the authors to give readers additional information about their work.

eSupplemental Information

Predictors

As noted in the text, we included 394 potential predictors spanning 11 broad APNS risk factor domains. A detailed list of constructs, measures, and scoring rules is presented in eTable1. A brief overview is presented here.

*MVC characteristics***:** Patient-reported MVC characteristics included whether the patient was a driver or passenger, the collision was with a moving vehicle or stationary object, amount of vehicle damage, severity of injuries sustained by people other than the patient, and timing/method of transport to the ED. Details were also recorded in the ED about severity of patient injuries[1] and whether the patient was hospitalized or discharged.

Peri-traumatic symptoms and signs assessed in the ED: Patients in the ED rated their pain and other somatic symptoms both currently and in the 30 days before the MVC. Difference scores were created.[2-4] Vital signs included pulse, respiration, diastolic and systolic blood pressure, and the shock index (the ratio of pulse rate to systolic blood pressure).[5] Peri-traumatic distress and dissociation were assessed using short-forms of standard self-report scales.[6] Patients also rated how quickly they expected to recover physically and emotionally from the MVC.

Chronic stressors: Standard scales were used to assess chronic stressors in finances, career, health, love life, other relationships, and life overall[7] and overall perceived stress.[8]

Prior lifetime traumatic experiences: Measures of childhood maltreatment and bullying and lifetime exposure to diverse traumatic events were assessed with measures developed in the World Health Organization World Mental Health Surveys.[9]

Past 30-day psychological distress: 30-day pre-MVC psychological distress was assessed with standard screening scales for PTSD,[10] MDE,[11] generalized anxiety disorder,[11] panic,[12] and substance abuse[13] along with selected items assessing anger, dissociation, and rumination. We did not exclude patients who already met criteria for 30-day PTSD or MDE pre-MVC, but these symptoms were examined as predictors.

Physical health: 30-day pre-MVC general health was assessed with the 12-item Short Form Health Survey (SF-12).[14] Standard self-report checklists were administered for chronic conditions and medications.

Past 30-day role impairment: 30-day pre-MVC role impairment due to mental or physical health problems was assessed with the Sheehan Disability Scale.[15]

Lifetime mental disorders: An expanded self-report version of the FH-RDC interview[16] focused on the patient rather than family members was used to assess lifetime mental disorders.

Socio-demographics: Age, sex, race/ethnicity, education, employment status, family income, marital status, and number of children were assessed by self-report.

Social support: Patients reported their social network size, affiliative interaction frequency, and access to social support.[17]

Personality: Brief screening scales assessed the Big 5 personality dimensions,[18] anxiety sensitivity[19] and distress tolerance.[20]

Outcome

As noted in the text, the outcome was self-reported PTSD or MDE over a 30-day recall period assessed in the 3-month survey. PTSD was assessed with the 20-item PTSD Checklist for DSM-5[21] (PCL-5), a 20-item self-report scale with a 0-4 response format indicating how much the patient was "bothered by" each of the 20 Criterion B-E symptoms of DSM-5 PTSD (Cronbach's α=.96). Of the several diagnostic classification rules proposed for the PCL-5,[22,23] we

selected a conservative threshold of ≥38. MDE was assessed with the PROMIS Depression Short-Form 8b,[11] an 8-item scale with a 1-5 response format indicating how often the patient experienced depressive symptoms over the recall period (Cronbach's α=.95). Raw scores were summed, and patients who had a score of ≥30 were classified as meeting criteria for MDE based on the PROMIS U.S. general population norms (mean=50 and SD=10)[24] and the conservative assumption that 5% of general population meets criteria for MDE (i.e., a raw score of ≥30 corresponds to a t-score of ≥66.5, which is 1.65 standard deviations above the general population mean, where we would expect 5% of the population). Participants who met criteria either for PTSD and/or MDE were classified as having the outcome.

We also assessed 3-month role impairment using a modified version of the Sheehan Disability Scale[15] to assess difficulties functioning at work or school, in family life or home responsibilities, and in social life or leisure activities during the past 30 days due to problems with physical or emotional health. Responses were recorded on a 0-10 visual analogue scale where "0" was defined as not at all disruptive and "10" as extremely disruptive. Responses of 7-10 were defined as severe. Patients were also asked a question from the WHO Disability Assessment Schedule[25] about how many days in the 30 before the 3-month survey they were totally unable to work or carry out their usual activities (i.e., days out of role) because of problems with their physical or emotional health.

eTable 1. This table shows each of the 394 predictor variables used in the analyses. We provide references to support why we included each variable as a potential predictor, and for variables based on measures, we also provide references for these measures. We show the original survey questions and response options used to create the predictor variables. Some survey questions were slightly modified from their original measures to have consistent time frames and response options across questions, and these modifications are described in this table. Although all predictors were considered to be baseline predictors in analyses, some variables were collected at 2-week or 8-week follow-up surveys rather than in the emergency department, as noted in this table, to reduce patient burden in the emergency department. The variables collected at 2-week and 8-week follow-up surveys included those pertaining to lifetime traumatic events, childhood traumas, personality characteristics, family income, and others, which were not expected to change from evaluation in the emergency department to when they were assessed.

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
I. Motor vehicle collision characteristics						
Participant's role in vehicle[26]	Standard items	Peritrauma (ED)	N/A	*Seated in car/truck/SUV/van/bus/other:* 1=Driver; 2=Center-front passenger; 3=Right-front passenger; 4=Left-second seat passenger; 5=Center-second seat passenger; 6=Right-second seat passenger; 7=Left-third seat passenger; 8=Center-third seat passenger; 9=Right-third seat passenger; 10=Passenger in bus or large; 11=Somewhere else, please describe	Dichotomous – **Role_Driver_Alone Role_Driver_Others Role_Passenger** Role in Motor Vehicle Collision [1=Yes; 0=No]	Stein DJ, Karam EG, Shahly V, et al. Post-traumatic stress disorder associated with life-threatening motor vehicle collisions in the WHO World Mental Health Surveys. *BMC Psychiatry*. 2016;16:257. Published 2016 Jul 22. doi:10.1186/s12888-016-0957-8

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
				Seated in motorcycle/ATV/boat: 1=Driver; 2=Front-seat passenger; 3=Back-seat passenger; 4=Somewhere else, please describe *Others in vehicle:* 1=Yes; 0=No *Number in vehicle:* Open-ended integer *Relationship:* 1=Friend; 2=Partner/Spouse; 3=Son/Daughter; 4=Parent; 5=Sibling; 6=Other Family; 7=Stranger; 8=Acquaintance		
Vehicle hit an object[27]	Standard items	Peritrauma (ED)	N/A	*Vehicle hit object:* 1=Yes; 0=No *Vehicle in motion; Stationary vehicle; Stationary object/non-vehicle; Person on non-motorized vehicle; Pedestrian; Other:* 1=Selected; 0=Not selected	Dichotomous – **Vehicle_Hit_Movingvhcl** **Vehicle_Hit_Object** **Vehicle_Hit_Allothers** Type of Object Vehicle Hit [1=Yes; 0=No]	Kazantzis N, Kennedy-Moffat J, Flett RA, Petrik AM, Long NR, Castell B. Predictors of chronic trauma-related symptoms in a community sample of New Zealand motor vehicle accident survivors. *Cult Med Psychiatry*. 2012;36(3):442-464.

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
						doi:10.1007/s11013-012-9265-z
Severity of vehicle damage[27]	Standard items	Peritrauma (ED)	N/A	*Damage to vehicle:* 0=No damage; 1=Minor damage; 2=Moderate damage; 3=Damage was so severe that you could not drive the vehicle *Front; rear end; left side front; left side door; left side rear; right side front; right side door; right side rear; top/roof; undercarriage; other*: 1=Selected; 0=Not selected	Dichotomous – **Vehicle_Damage_Severe** **Vehicle_Damage_Moderate** **Vehicle_Damage_Minor** **Vehicle_Damage_Other** Severity of Vehicle Damage [1=Yes; 0=No]	Kazantzis N, Kennedy-Moffat J, Flett RA, Petrik AM, Long NR, Castell B. Predictors of chronic trauma-related symptoms in a community sample of New Zealand motor vehicle accident survivors. *Cult Med Psychiatry*. 2012;36(3):442-464. doi:10.1007/s11013-012-9265-z
Number of passengers[26]	Standard items	Peritrauma (ED)	N/A	*Others in vehicle:* 1=Yes; 0=No *Number in vehicle:* Open-ended integer	Continuous - **NumPeopleVeh** Number of Passengers in Vehicle	Stein DJ, Karam EG, Shahly V, et al. Post-traumatic stress disorder associated with life-threatening motor vehicle collisions in the WHO World Mental Health Surveys. *BMC Psychiatry*. 2016;16:257. Published 2016 Jul 22. doi:10.1186/s12888-016-0957-8

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
Passenger injuries[26]	Standard items	Peritrauma (ED)	N/A	*Others in vehicle:* 1=Yes; 0=No *Number in vehicle:* Open-ended integer *Worst injury*: 0=No injury; 1=Injured, did not go to ER; 2=Injured, went to ER; 3=Deceased	Continuous - **NumPeopleInj** Number of Passengers Injured	Stein DJ, Karam EG, Shahly V, et al. Post-traumatic stress disorder associated with life-threatening motor vehicle collisions in the WHO World Mental Health Surveys. *BMC Psychiatry*. 2016;16:257. Published 2016 Jul 22. doi:10.1186/s12888-016-0957-8
Seat belt[26]	Standard item	Peritrauma (ED)	N/A	*Seat belt:* 1=Lap belt only; 2=Shoulder belt only; 3=Combination lap and shoulder belt; 4=Not wearing a lap or shoulder belt	Dichotomous - **No_Seatbelt**** Wearing a Seatbelt [1=Yes; 0=No]	Stein DJ, Karam EG, Shahly V, et al. Post-traumatic stress disorder associated with life-threatening motor vehicle collisions in the WHO World Mental Health Surveys. *BMC Psychiatry*. 2016;16:257. Published 2016 Jul 22. doi:10.1186/s12888-016-0957-8
Transportation to ED[28]	Standard items	Peritrauma (ED)	N/A	*Came to ED directly*: 1=Yes; 0=No *Mode of transportation:* 1=Ambulance;	Dichotomous – **Transport_Ambulance** Mode of Transportation to ED was Ambulance	Pozzato I, Craig A, Gopinath B, et al. Outcomes after traffic injury: mental health comorbidity and relationship with

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
				2=Participant drove self; 3=A friend of family member drove participant; 4=Some other way, please describe	[1=Yes; 0=No] **ERDirectly** Came to ED Directly [1=Yes; 0=No]	pain interference. *BMC Psychiatry*. 2020;20(1):189. Published 2020 Apr 28. doi:10.1186/s12888-020-02601-4
Chance of dying[28,29]	AA Crash Study	Peritrauma (ED)	Item was taken from the AA CRASH Study survey	*Rate chance of dying:* 0-10 NRS, 0=Life was not threatened at all; 10=Came very close to being killed or easily could have been killed	Continuous - **ChanceofDying** Chance of Fatality [Score of single item]	Linnstaedt SD, Hu J, Liu AY, et al. Methodology of AA CRASH: a prospective observational study evaluating the incidence and pathogenesis of adverse post-traumatic sequelae in African-Americans experiencing motor vehicle collision. *BMJ Open*. 2016;6(9):e012222. Published 2016 Sep 6. doi:10.1136/bmjopen-2016-012222 Pozzato I, Craig A, Gopinath B, et al. Outcomes after traffic injury: mental health comorbidity and relationship with pain interference. *BMC Psychiatry*. 2020;20(1):189. Published 2020 Apr 28.

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
						doi:10.1186/s12888-020-02601-4
Brain tissue injury[29-31]	AA Crash Study and TRACK-TBI International Traumatic Brain Injury Research Initiative	Peritrauma (ED)	Items were based on the AA Crash Study survey and the TRACK-TBI Study survey	*Hit head during event:* 1=Yes; 0=No *After event knocked out/unconscious, amnesia, dazed/confused*: 1=Yes; 0=No *Length of time knocked out, amnesia, dazed/confused*: 1=Just a few seconds; 2=Less than a minute; 3=One minute or more (how many minutes/hours) *Not know where you were/what happened after event*: 1=Yes; 0=No *Repeat questions after event:* 1=Yes; 0=No Used diagnosis fields, injury description fields, radiology reports, and abnormal scan readings	Dichotomous – **TB_HitHead** Hit Head during Event [1=Yes; 0=No] **TB_KnockedOut** Knocked out after Event [1=Yes; 0=No] **TB_Amnesia** Forgot Details about Event [1=Yes; 0=No] **dazed_1minplus** Dazed 1 Minute or Longer [1=Yes; 0=No] **uncons_1minplus** Unconscious 1 Minute or Longer [1=Yes; 0=No] **TB_WhatHappened** Trouble Knowing What Happened [1=Yes; 0=No] **TB_AskQuestion** Asked Same Question/Insisted Could Do Things [1=Yes; 0=No]	Linnstaedt SD, Hu J, Liu AY, et al. Methodology of AA CRASH: a prospective observational study evaluating the incidence and pathogenesis of adverse post-traumatic sequelae in African-Americans experiencing motor vehicle collision. *BMJ Open*. 2016;6(9):e012222. Published 2016 Sep 6. doi:10.1136/bmjopen-2016-012222. University of California, San Francisco Brain and Spinal Injury Center. *TRACK-TBI*; 2014. Available at: https://tracktbi.ucsf.edu/researchers Stein MB, Kessler RC, Heeringa SG, et al. Prospective longitudinal evaluation of the effect of

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
						deployment-acquired traumatic brain injury on posttraumatic stress and related disorders: results from the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS). *Am J Psychiatry*. 2015;172(11):1101-1111. doi:10.1176/appi.ajp.2015.14121572
Imaging procedures[26]	Standard items	Peritrauma (ED)	N/A	Used diagnosis fields, injury description fields, radiology reports, and abnormal scan readings	Continuous - **Radiol_num** Number of CT Scans, X-Ray and Other Images Taken in ED	Stein DJ, Karam EG, Shahly V, et al. Post-traumatic stress disorder associated with life-threatening motor vehicle collisions in the WHO World Mental Health Surveys. *BMC Psychiatry*. 2016;16:257. Published 2016 Jul 22. doi:10.1186/s12888-016-0957-8
Other procedures[26]	Standard items	Peritrauma (ED)	N/A	Used diagnosis fields, injury description fields, radiology reports, and abnormal scan readings	Dichotomous - **any_procedures** At Least One Procedure in ED (Laceration Repair,	Stein DJ, Karam EG, Shahly V, et al. Post-traumatic stress disorder associated with life-threatening motor

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
					Fracture Setting, Catheterization) [1=Yes; 0=No]	vehicle collisions in the WHO World Mental Health Surveys. *BMC Psychiatry*. 2016;16:257. Published 2016 Jul 22. doi:10.1186/s12888-016-0957-8
Number of injured body regions[26]	Standard items	Peritrauma (ED)	N/A	*Head injury; facial injury; neck/spine injury; thorax/chest injury; breast injury; abdomen injury; pelvic injury; pelvic/ spine/back injury; upper extremity injury; lower extremity injury:* 1=Yes; 0=No	Continuous - **Injury_num** Number of Injured Body Regions [Sum of 10 items]	Stein DJ, Karam EG, Shahly V, et al. Post-traumatic stress disorder associated with life-threatening motor vehicle collisions in the WHO World Mental Health Surveys. *BMC Psychiatry*. 2016;16:257. Published 2016 Jul 22. doi:10.1186/s12888-016-0957-8
Admitted to hospital[28]	Standard item	Peritrauma (ED)	N/A	*Patient course:* 1=Admitted; 0=Discharged	Dichotomous – **Admit** Patient was Admitted to Hospital [1=Admitted; 0=Not admitted]	Pozzato I, Craig A, Gopinath B, et al. Outcomes after traffic injury: mental health comorbidity and relationship with pain interference. *BMC Psychiatry*. 2020;20(1):189. Published 2020 Apr 28.

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
						doi:10.1186/s12888-020-02601-4
II. Peri-traumatic symptoms						
Global pain[2,32]	Pain Intensity Numeric Rating Scale (PI-NRS)	Peritrauma (ED) 30 Days Before Event (ED)	Used all items from original measure with no change in response options; Modified time frame	*Intensity of all physical pain:* 0-10 NRS, 0=No pain; 10=Severe pain or tenderness	Continuous – **Pain**** **Diff_Pain** Global Pain Intensity [Score of single item]	Farrar JT, Young JP Jr, LaMoreaux L, Werth JL, Poole RM. Clinical importance of changes in chronic pain intensity measured on an 11-point numerical pain rating scale. Pain. 2001;94(2):149-158. doi:10.1016/s0304-3959(01)00349-9 Feinberg RK, Hu J, Weaver MA, et al. Stress-related psychological symptoms contribute to axial pain persistence after motor vehicle collision: path analysis results from a prospective longitudinal study. Pain. 2017;158(4):682-690. doi:10.1097/j.pain.0000000000000818
Regional/ widespread pain[32,33]	Regional Pain Scale (RPS)	Peritrauma (ED) 30 Days Before Event (ED)	Used 16 out of 19 items from original measure and	*Intensity of pain in head; neck; jaw; left shoulder; right*	Continuous – **Pain_Head** **Pain_Neck**	Wolfe F. Pain extent and diagnosis: development and

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
			created 2 new items; Modified response options and time frame	*shoulder; left upper arm; right upper arm; left lower arm; right lower arm; chest; upper back; lower back; abdomen; genital area; left hip/upper leg; right hip/upper leg; left lower leg; right lower leg*: 0-10 NRS, 0=No pain; 10=Severe pain or tenderness	**Pain_Jaw** **Pain_LeftShoulder**** **Pain_RightShoulder** **Pain_LeftUpperArm**** **Pain_RightUpperArm**** **Pain_LeftLowerArm** **Pain_RightLowerArm**** **PainChest**** **PainUpperBack** **PainLowerBack** **PainAbdomen** **PainGenital** **PainLeftHipUpperLeg** **PainRightHipUpperLeg** **PainLeftLowerLeg** **PainRightLowerLeg** Pain Intensity in Each Body Region [Score of each item]	validation of the regional pain scale in 12,799 patients with rheumatic disease. *J Rheumatol*. 2003;30(2):369-378. Feinberg RK, Hu J, Weaver MA, et al. Stress-related psychological symptoms contribute to axial pain persistence after motor vehicle collision: path analysis results from a prospective longitudinal study. *Pain*. 2017;158(4):682-690. doi:10.1097/j.pain.0000000000000818
Regional/ widespread pain (continued)[32,33]	Regional Pain Scale (RPS)	Peritrauma (ED) 30 Days Before Event (ED)	Used 16 out of 19 items from original measure and created 2 new items; Modified response options and time frame	*Intensity of pain in head; neck; jaw; left shoulder; right shoulder; left upper arm; right upper arm; left lower arm; right lower arm; chest; upper back; lower back; abdomen; genital*	**Diff_Pain_Head** **Diff_Pain_Neck** **Diff_Pain_Jaw** **Diff_Pain_LeftShoulder** **Diff_Pain_RightShoulder** **Diff_Pain_LeftUpperArm****	Wolfe F. Pain extent and diagnosis: development and validation of the regional pain scale in 12,799 patients with rheumatic disease. *J Rheumatol*. 2003;30(2):369-378.

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
				area; left hip/upper leg; right hip/upper leg; left lower leg; right lower leg: 0-10 NRS, 0=No pain; 10=Severe pain or tenderness	**Diff_Pain_RightUpperArm** **Diff_Pain_LeftLowerArm** **Diff_Pain_RightLowerArm** **Diff_PainChest*** **Diff_PainUpperBack** **Diff_PainLowerBack** **Diff_PainAbdomen** **Diff_PainGenital** **Diff_PainLeftHipUpperLeg** **Diff_PainRightHipUpperLeg** **Diff_PainLeftLowerLeg** **Diff_PainRightLowerLeg** Difference in Body Region Pain Scores from Pretrauma to Peritrauma [Subtract pretrauma NRS from peritraumatic NRS scores for each item]	Feinberg RK, Hu J, Weaver MA, et al. Stress-related psychological symptoms contribute to axial pain persistence after motor vehicle collision: path analysis results from a prospective longitudinal study. *Pain*. 2017;158(4):682-690. doi:10.1097/j.pain.0000000000000818
Pain catastrophizing[28,34]	Pain Catastrophizing Scale (PCS) - Rumination Subscale	30 Days Before Event (ED)	Used 2 out of 13 items from original measure; Modified response options and time frame	*When in pain think how much it hurts; How badly want it to stop:* 1=None of the time; 2=A little of the time; 3=Some of the time; 4=Most of the time; 5=All or almost all of the time	Continuous – **PainThinkingHowMuchItHurt** **PainThinkingPainToStop** Pain Rumination [Score of each item]	Sullivan MJL, Bishop SR, Pivik J. The Pain Catastrophizing Scale: Development and validation. *Psychol Assess*. 1995;7(4):524–532. https://doi.org/10.10

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
						37/1040-3590.7.4.524 Pozzato I, Craig A, Gopinath B, et al. Outcomes after traffic injury: mental health comorbidity and relationship with pain interference. *BMC Psychiatry*. 2020;20(1):189. Published 2020 Apr 28. doi:10.1186/s12888-020-02601-4
Pain interference[28,35]	PROMIS Pain Interference - Short Form 4a	30 Days Before Event (ED)	All items used from original measure; Modified response options and time frame	*Pain interferes with daily activities; work around home; social activities; chores*: 1=Not at all; 2=A little; 3=Some; 4=A lot; 5=Extremely	Continuous – **PainDayToDayInterfere PainWorkHomeInterfere PainSocialInterfere PainHomeChoresInterfere** Severity of Pain Interference in Each Area of Life [Score of each item]	Teresi JA, Ocepek-Welikson K, Cook KF, et al. Measurement Equivalence of the Patient Reported Outcomes Measurement Information System® (PROMIS®) Pain Interference Short Form Items: Application to Ethnically Diverse Cancer and Palliative Care Populations. *Psychol Test Assess Model*. 2016;58(2):309-352.

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
						Pozzato I, Craig A, Gopinath B, et al. Outcomes after traffic injury: mental health comorbidity and relationship with pain interference. *BMC Psychiatry*. 2020;20(1):189. Published 2020 Apr 28. doi:10.1186/s12888-020-02601-4
Somatic symptoms[3,4,36]	Pennebaker Inventory of Limbic Languidness (PILL) & The Rivermead Post-Concussion Symptoms Questionnaire (RPQ)	Peritrauma (ED) 30 Days Before Event (ED)	Used 12 out of 54 items from PILL measure and 8 out of 16 items from RPQ measure (4 of our 20 symptoms are in both measures; our wording is similar to the PILL); Modified response options and time frame	*Headaches; dizziness; nausea; noise sensitivity; light sensitivity; concentrating; longer to think; blurred vision; double vision; restlessness; stomachache; fatigue; sensitive skin; tinnitus; itchy; racing heart; insomnia; trembling hands; faint; bowel problems:* 0-10 NRS, 0=No problem; 10=A major problem	Continuous – **Headache Dizziness** Nausea Insomnia** UpsetStomach SensitiveSkin RingingEars ItchyEyesSkin RacingHeart** Trembling** Faint** Constipation Noise** Light** Concentration LongerThink BlurredVision** DoubleVision Restlessness Fatigue** Severity of Each Somatic Symptom [Score of each item]	Pennebaker JW, Watson D. The Psychology of Somatic Symptoms. In Kirmayer LJ, Robbins JM. (Eds.), *Current Concepts of Somatization: Research and Clinical Perspectives*. Arlington, VA: American Psychiatric Association; 1991: 21. King NS, Crawford S, Wenden FJ, Moss NE, Wade DT. The Rivermead Post Concussion Symptoms Questionnaire: a

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
						measure of symptoms commonly experienced after head injury and its reliability. *J Neurol*. 1995;242(9):587-592. doi:10.1007/BF00868811 Zatzick DF, Russo JE, Katon W. Somatic, posttraumatic stress, and depressive symptoms among injured patients treated in trauma surgery. *Psychosomatics*. 2003;44(6):479-484. doi:10.1176/appi.psy.44.6.479
Somatic symptoms (Continued)[3,4,36]	Pennebaker Inventory of Limbic Languidness (PILL) & The Rivermead Post-Concussion Symptoms Questionnaire (RPQ)	Peritrauma (ED) 30 Days Before Event (ED)	Used 12 out of 54 items from PILL measure and 8 out of 16 items from RPQ measure (4 of our 20 symptoms are in both measures; our wording is similar to the PILL); Modified response options and time frame	*Headaches; dizziness; nausea; noise sensitivity; light sensitivity; concentrating; longer to think; blurred vision; double vision; restlessness; stomachache; fatigue; sensitive skin; tinnitus; itchy; racing heart; insomnia; trembling hands; faint; bowel*	**Diff_Headache** **Diff_Dizziness** **Diff_Nausea** **Diff_Insomnia** **Diff_UpsetStomach** **Diff_SensitiveSkin** **Diff_RingingEars** **Diff_ItchyEyesSkin** **Diff_RacingHeart** **Diff_Trembling**** **Diff_Faint** **Diff_Constipation**** **Diff_Noise** **Diff_Light**	Pennebaker JW, Watson D. The Psychology of Somatic Symptoms. In Kirmayer LJ, Robbins JM. (Eds.), *Current Concepts of Somatization: Research and Clinical Perspectives*. Arlington, VA: American Psychiatric Association; 1991:

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
				problems: 0-10 NRS, 0=No problem; 10=A major problem	**Diff_Concentration** **Diff_LongerThink** **Diff_BlurredVision** **Diff_DoubleVision** **Diff_Restlessness** **Diff_Fatigue** Difference in Somatic Symptom Scores from Pretrauma to Peritrauma [Subtract pretrauma NRS from peritraumatic NRS scores for each item]	21. King NS, Crawford S, Wenden FJ, Moss NE, Wade DT. The Rivermead Post Concussion Symptoms Questionnaire: a measure of symptoms commonly experienced after head injury and its reliability. *J Neurol*. 1995;242(9):587-592. doi:10.1007/BF00868811 Zatzick DF, Russo JE, Katon W. Somatic, posttraumatic stress, and depressive symptoms among injured patients treated in trauma surgery. *Psychosomatics*. 2003;44(6):479-484. doi:10.1176/appi.psy.44.6.479
Heart rate/pulse	Standard item	Peritrauma (ED)	N/A	*Pulse rate:* Open-ended integer	Continuous - **PulseRate** Heart Rate/Pulse	N/A

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
Respiratory rate	Standard item	Peritrauma (ED)	N/A	*Respiratory Rate:* Open-ended integer	Continuous - **RespiratoryRate** Respiratory Rate	N/A
Systolic blood pressure	Standard item	Peritrauma (ED)	N/A	*Systolic blood pressure:* Open-ended integer	Continuous - **SystolicBP** Systolic Blood Pressure	N/A
Diastolic blood pressure	Standard item	Peritrauma (ED)	N/A	*Diastolic blood pressure:* Open-ended integer	Continuous - **DiastolicBP** Diastolic Blood Pressure	N/A
Shock Index	Standard item	Peritrauma (ED)	N/A	*Pulse rate:* Open-ended integer *Systolic blood pressure:* Open-ended integer	Continuous - **shock_index** Shock Index [Ratio of pulse rate to systolic blood pressure]	N/A
Peritraumatic distress[6,37,38]	Peritraumatic Distress Inventory (PDI)	Peritrauma (ED)	Used 8 out of 13 items from original measure with no change in time frame; Modified response options	*Feel helpless; Feel afraid; Lose control; Difficulty controlling bowel or bladder; Feel horrified; Pass out; Might die:* 0=None of the time; 1=A little of the time; 2=Some of the time; 3=Most of the time; 4=All or almost all of the time	Continuous – **PDI_Helpless** **PDI_AfraidForMySafety** **PDI_AboutToLoseControl** **PDI_DifficultyBowel** **PDI_HorrifiedByWhatHappen** **PDI_PhysicalReactions** **PDI_MightPassOut** **PDI_MightDie** Severity of Each Peritraumatic Symptom [Score of each item]	Brunet A, Weiss DS, Metzler TJ, et al. The Peritraumatic Distress Inventory: a proposed measure of PTSD criterion A2. *Am J Psychiatry*. 2001;158(9):1480-1485. doi:10.1176/appi.ajp.158.9.1480 Bunnell BE, Davidson TM, Anton MT, Crookes BA, Ruggiero KJ. Peritraumatic distress predicts

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
						depression in traumatically injured patients admitted to a Level I trauma center. *Gen Hosp Psychiatry*. 2018;54:57-59. doi:10.1016/j.genhosppsych.2018.02.009 Joormann J, McLean SA, Beaudoin FL, et al. Socio-demographic and trauma-related predictors of depression within eight weeks of motor vehicle collision in the AURORA study [published online ahead of print, 2020 Oct 29]. *Psychol Med*. 2020;1-14. doi:10.1017/S0033291720003773
Peritraumatic dissociation[39,40]	5-Item Revised Michigan Critical Events Perception Scale (MCEPS)	Peritrauma (ED)	All items used from original measure with no change in time frame; Modified response options	*No passage of time; In a daze; Outside watching self; Events around unreal; In a dream:* 0=None of the time; 1=A little of the time; 2=Some of the time; 3=Most of the time; 4=All or almost all of the time	Continuous – **MCEPS_NoPassageTime** **MCEPS_InADaze** **MCEPS_Watching Self** **MCEPS_SomeoneElse** **MCEPS_InADream** Severity of Each Peritraumatic Symptom	Michaels AJ, Michaels CE, Moon CH, et al. Posttraumatic stress disorder after injury: impact on general health outcome and early risk assessment. *J Trauma*. 1999;47(3):460-467. doi:10.1097/000053

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
					[Score of each item]	73-199909000-00005 Duncan E, Dorahy MJ, Hanna D, Bagshaw S, Blampied N. Psychological responses after a major, fatal earthquake: the effect of peritraumatic dissociation and posttraumatic stress symptoms on anxiety and depression. *J Trauma Dissociation*. 2013;14(5):501-518. doi:10.1080/15299732.2013.769479
Expectations for recovery[41,42]	AA Crash Study	Peritrauma (ED)	Items were taken from the AA CRASH Study survey	*Length to recover physically and emotionally:* Open-ended integer & 0=Never; 1=Days; 2=Weeks; 3=Months; 4=Years	Continuous- **DaysRecoverPhys** **DaysRecoverEmot** Perceived Number of Days to Recover Physically/Emotionally [Score of items converted to number of days] Dichotomous- **neverRecoverPhys** **neverRecoverEmot** Thinks will Never Recover	Carosella AM, Lackner JM, Feuerstein M. Factors associated with early discharge from a multidisciplinary work rehabilitation program for chronic low back pain. *Pain*. 1994;57(1):69-76. doi:10.1016/0304-3959(94)90109-0 Lewis GC, Platts-

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
					[1=Yes; 0=No]	Mills TF, Liberzon I, et al. Incidence and predictors of acute psychological distress and dissociation after motor vehicle collision: a cross-sectional study. *J Trauma Dissociation*. 2014;15(5):527-547. doi:10.1080/15299732.2014.908805
III. Recent stressors						
Chronic stress[7,26]	The MIDUS Self-Report Scale of Perceived Stress	30 Days Before Event (ED)	All items used from original measure and created 3 new items; Modified response options and time frame	*Amount of stress in finances; Career; Health; Love life; Relationships; Health of loved ones; Other problems with loved ones; Work; Life overall:* 0-10 Numeric Rating Scale (NRS), 0=No stress; 10=Very severe stress	Continuous – **StressFinances StressCareer StressHealth StressLoveLife StressRelationships StressHealthOfLovedOnes StressOthrProbLovedOnes StressProblemsWorkComm StressLifeOverall** Amount of Stress in Each Area of Life [Score of each item]	Kessler RC, Hamilton L, Mickelson KD, Walters EE, Zhao S. Age and depression in the MIDUS survey. In: *How Healthy Are We? A National Study of Well-Being at Midlife.* Chicago, IL: University of Chicago Press; 2004: 227-251. Stein DJ, Karam EG, Shahly V, et al. Post-traumatic stress disorder associated with life-threatening motor vehicle collisions in the WHO World

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
						Mental Health Surveys. *BMC Psychiatry*. 2016;16:257. Published 2016 Jul 22. doi:10.1186/s12888-016-0957-8
Perceived stress[8,43]	10-Item Perceived Stress Scale (PSS)	30 Days Before Event (ED)	Used 9 out of 10 items from original measure with no change in time frame; Modified response options	*Upset by unexpected things; unable to control; nervous; couldn't cope; angry outside of control; overwhelmed; confident handle problems; things going your way; on top of things*: 1=None of the time; 2=A little of the time; 3=Some of the time; 4=Most of the time; 5=All or almost all of the time	Continuous – **FeelUpsetUnexpectedHappen** **UnableToControl** **NervousStressed** **CouldNotCope** **AngeredOutsideControl** **PilingUpTooHigh** General Distress [Score of each item] **ConfidentHandleProblems** **GoingMyWay** **TopOfThings** Ability to Cope [Score of each item]	Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *J Health Soc Behav*. 1983;24(4):385-396. Hewitt PL, Flett GL, Mosher SW. The Perceived Stress Scale: Factor structure and relation to depression symptoms in a psychiatric sample. *J Psychopathol Behav Assess*. 1992;14(3):247-257.
IV. Prior lifetime traumatic experiences						
Childhood trauma[26,44]	Childhood Trauma Questionnaire (CTQ)	Lifetime (WK2)	Used 11 out of 28 items from original measure; No change in response options or time frame	*Emotionally abused; Insults; Physically abuse; Hit hard; Sexually abused; Sexual things; Molested; Felt special; Felt loved; Protected; Taken to doctor:* 0=Never; 1=Rarely;	Continuous – **ChildhoodInsults** **ChildhoodEmotionallyAbused**** Emotional Abuse [Score of each item] **ChildhoodBruises** **ChildhoodPhysicallyAbused**	Bernstein DP, Stein JA, Newcomb MD, et al. Development and validation of a brief screening version of the Childhood Trauma Questionnaire. *Child Abuse Negl*. 2003;27(2):169-190.

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
				2=Sometimes; 3=Often; 4=Very often	Physical Abuse [Score of each item] **ChildhoodSexualThings** **ChildhoodMolested** **ChildhoodSexuallyAbused** Sexual Abuse [Score of each item] **ChildhoodFeltLoved** **ChildhoodFeelSpecial** Emotional Neglect [Score of each item] **ChildhoodCareProtect** **ChildhoodTakeToDoctor** Physical Neglect [Score of each item]	doi:10.1016/s0145-2134(02)00541-0 Stein DJ, Karam EG, Shahly V, et al. Post-traumatic stress disorder associated with life-threatening motor vehicle collisions in the WHO World Mental Health Surveys. *BMC Psychiatry*. 2016;16:257. Published 2016 Jul 22. doi:10.1186/s12888-016-0957-8
Childhood bullying[26,45]	SCID-II Screening Questionnaire	Lifetime (WK2)	Used 2 items from original measure; Modified response options and time frame	*Called names; Threatened to hit or hurt you:* 0=Never; 1=Rarely; 2=Sometimes; 3=Often; 4=Very often	Continuous – **ChildhoodBullying** **ChildhoodHitOrHurt** Bullied or Hurt as a Child [Score of each item]	Spitzer RL, William JBW, Gibbon M, First MB. *SCID user's guide for the structured clinical interview for DSM-III-R*. Washington, DC: American Psychiatric Press; 1990. Stein DJ, Karam EG, Shahly V, et al.

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
						Post-traumatic stress disorder associated with life-threatening motor vehicle collisions in the WHO World Mental Health Surveys. *BMC Psychiatry*. 2016;16:257. Published 2016 Jul 22. doi:10.1186/s12888-016-0957-8
Previous trauma[10,27]	Life Events Checklist (LEC-5) for DSM-5	Lifetime (WK8)	All items used from original measure with no changes	*Natural disaster; Fire; Car accident; Work accident; Toxic substance; Physical assault; Assault with weapon; Sexual assault; Other sexual experience; Combat; Captivity; Illness/injury; Human suffering; Violent death; Accidental death; Caused harm to others; Other event (It happened to you personally, You witnessed it happen to someone else, You learned about it happening to someone close to you, You were*	Dichotomous – **LT_[You/Wit/SO/Job]_NatDis** **LT_[You/Wit/SO/Job]_Fire** **LT_[You/Wit/SO/Job]_CarAccid** **LT_[You/Wit/SO/Job]_WorkAccid** **LT_[You/Wit/SO/Job]_ToxicExp** **LT_[You/Wit/SO/Job]_PhysAssault**** **LT_[You/Wit/SO/Job]_WeapAssault**** **LT_[You/Wit/SO/Job]_SexAssault** **LT_[You/Wit/SO/Job]_OthSexExp** **LT_[You/Wit/SO/Job]_Combat** **LT_[You/Wit/SO/Job]_Captive** **LT_[You/Wit/SO/Jo**	Weathers FW, Blake DD, Schnurr PP, Kaloupek DG, Marx BP, Keane TM. *The Life Events Checklist for DSM-5 (LEC-5) – Extended [measurement instrument]*; 2013. Available at: https://www.ptsd.va.gov/professional/assessment/te-measures/life_events_checklist.asp Kazantzis N, Kennedy-Moffat J, Flett RA, Petrik AM, Long NR, Castell B. Predictors of chronic trauma-related symptoms in a community sample

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
				exposed to details about it as part of your job, It does not apply to you): 1=Selected; 0=Not selected	**b]_Illness** **LT_[You/Wit/SO/Job]_HumanSuff** **LT_[You/Wit/SO/Job]_OthEvent** **LT_[Wit/SO/Job]_ViolentDth** **LT_[Wit/SO/Job]_AccidDth** **LT_You_InjHarmSO** Experienced Stressful Event in Lifetime [1=Yes; 0=No]	of New Zealand motor vehicle accident survivors. *Cult Med Psychiatry*. 2012;36(3):442-464. doi:10.1007/s11013-012-9265-z
V. Past 30-day psychological distress						
Post-traumatic stress disorder (PTSD)[23,46]	PTSD Checklist for DSM-5 (PCL-5)	30 Days Before Event (ED)	All items used from original measure with no change in time frame; Modified response options	*Disturbing memories; Bad dreams; Reliving event; Feeling upset; Strong reactions; Avoiding memories; Avoiding reminders; Amnesia; Negative beliefs; Blaming self; Strong negative emotions; Loss of interest; Feeling cut off; No positive emotions; Irritable; Risk taking; Super alert; Jumpy; Difficulty concentrating; Seep problems*: 0=Not at all; 1=A little; 2=Some; 3=A lot; 4=Extremely	Continuous – **DisturbingMemories** **FeelingUpset**** **AvoidReminders** **FeelingCutOff** **FeelingIrritable** **DifficultyConcentrate** **BadDreams** **RelivingEvent** **StrongPhysicalReactions** **AvoidStressExperience**** **TroubleRemember** **NoOneCanBeTrusted** **BlamingSelf** **FeelingFear** **LossOfInterest**	Weathers FW, Lit BT, Keane TM, Palmieri PA, Marx BP, Schnurr PP. *The PTSD Checklist for DSM-5 (PCL-5) – Standard [Measurement instrument]*; 2013. Available at: www.ptsd.va.gov Zuromski KL, Ustun B, Hwang I, et al. Developing an optimal short-form of the PTSD Checklist for DSM-5 (PCL-5). *Depress Anxiety*. 2019;36(9):790-800. doi:10.1002/da.22942

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Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
					LackPositiveEmotions **TakingRisks** **Superalert** **FeelingJumpy** **SleepProblems** Severity of Each PTSD Symptom [Score of each item]	
Depression[11]	PROMIS Depression - Short Form 8b	30 Days Before Event (ED)	All items used from original measure; Modified response options and time frame	*Worthless; nothing to look forward to; helpless; sad; failure; depressed; unhappy; hopeless*: 1=None of the time; 2=A little of the time; 3=Some of the time; 4=Most of the time; 5=All or almost all of the time	Continuous – **Worthless** **NothingToLookForward**** **Helpless** **Sad** **Failure** **Depressed** **Unhappy** **Hopeless**** Severity of Each Depression Symptom [Score of each item]	Cella D, Riley W, Stone A, et al. The Patient-Reported Outcomes Measurement Information System (PROMIS) developed and tested its first wave of adult self-reported health outcome item banks: 2005-2008. *J Clin Epidemiol*. 2010;63(11):1179-1194. doi:10.1016/j.jclinepi.2010.04.011
Mania[12,26]	The Composite International Diagnostic Interview Screening Scales (CIDI-SC)	30 Days Before Event (ED)	Used 2 items from original measure with no change in response options; Modified time frame	*Wound up; racing thoughts:* 1=None of the time; 2=A little of the time; 3=Some of the time; 4=Most of the time; 5=All or almost all of the time	Continuous – **WoundUp** **ThoughtsRacing** Severity of Each Manic Symptom [Score of each item]	Kessler RC, Calabrese JR, Farley PA, et al. Composite International Diagnostic Interview screening scales for DSM-IV anxiety and mood disorders. Psychol Med. 2013;43(8):1625-

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Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
						1637. doi:10.1017/S0033291712002334 Stein DJ, Karam EG, Shahly V, et al. Post-traumatic stress disorder associated with life-threatening motor vehicle collisions in the WHO World Mental Health Surveys. *BMC Psychiatry*. 2016;16:257. Published 2016 Jul 22. doi:10.1186/s12888-016-0957-8
Anxiety[11,26]	PROMIS Anxiety Bank Items	30 Days Before Event (ED)	Used 4 items out of 29 items from bank; Modified response options and time frame	*Feel anxious; worry; trouble relaxing; tense:* 1=None of the time; 2=A little of the time; 3=Some of the time; 4=Most of the time; 5=All or almost all of the time	Continuous – **Anxious WorryAboutThings TroubleRelax Tense** Severity of Each Anxiety Symptom [Score of each item]	Cella D, Riley W, Stone A, et al. The Patient-Reported Outcomes Measurement Information System (PROMIS) developed and tested its first wave of adult self-reported health outcome item banks: 2005-2008. *J Clin Epidemiol*. 2010;63(11):1179-1194. doi:10.1016/j.jclinepi.2010.04.011

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Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
						Stein DJ, Karam EG, Shahly V, et al. Post-traumatic stress disorder associated with life-threatening motor vehicle collisions in the WHO World Mental Health Surveys. *BMC Psychiatry*. 2016;16:257. Published 2016 Jul 22. doi:10.1186/s12888-016-0957-8
	The WHO Composite International Diagnostic Interview (CIDI)[26,47]	30 Days Before Event (ED)	Used 1 item from CIDI; Modified response options and time frame	*Afraid something bad might happen*: 1=None of the time; 2=A little of the time; 3=Some of the time; 4=Most of the time; 5=All or almost all of the time	Continuous – **Afraid**** Severity of Fearfulness [Score of single item]	Kessler RC, Ustün TB. The World Mental Health (WMH) Survey Initiative Version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). Int J Methods Psychiatr Res. 2004;13(2):93-121. doi:10.1002/mpr.168 Stein DJ, Karam EG, Shahly V, et al. Post-traumatic stress disorder associated with life-threatening motor vehicle collisions in

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Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
						the WHO World Mental Health Surveys. *BMC Psychiatry*. 2016;16:257. Published 2016 Jul 22. doi:10.1186/s12888-016-0957-8
Panic[12,26]	The Composite International Diagnostic Interview Screening Scales (CIDI-SC)	30 Days Before Event (ED)	Used 1 item from CIDI; Modified response options and time frame	*Sudden attacks of panic/fear:* 1=None of the time; 2=A little of the time; 3=Some of the time; 4=Most of the time; 5=All or almost all of the time	Continuous – **PanicAttack** Severity of Panic [Score of single item]	Kessler RC, Calabrese JR, Farley PA, et al. Composite International Diagnostic Interview screening scales for DSM-IV anxiety and mood disorders. Psychol Med. 2013;43(8):1625-1637. doi:10.1017/S0033291712002334 Stein DJ, Karam EG, Shahly V, et al. Post-traumatic stress disorder associated with life-threatening motor vehicle collisions in the WHO World Mental Health Surveys. *BMC Psychiatry*. 2016;16:257. Published 2016 Jul 22.

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Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
						doi:10.1186/s12888-016-0957-8
Tobacco use & dependence[48-50]	PhenX Toolkit Tobacco – 30-Day Quantity & Frequency	30 Days Before Event (ED)	All items used from original measure; Modified first question to ask about any nicotine products	*Number of days using tobacco:* Open-ended integer	Continuous – **PhenX_Tob30d_Freq** Frequency of Tobacco Use [Score of single item]	Hamilton CM, Strader LC, Pratt JG, et al. The PhenX Toolkit: get the most from your measures. *Am J Epidemiol*. 2011;174(3):253-260. doi:10.1093/aje/kwr193
						Koenen KC, Hitsman B, Lyons MJ, et al. A twin registry study of the relationship between posttraumatic stress disorder and nicotine dependence in men. *Arch Gen Psychiatry*. 2005;62(11):1258-1265. doi:10.1001/archpsyc.62.11.1258
						Flensborg-Madsen T, von Scholten MB, Flachs EM, Mortensen EL, Prescott E, Tolstrup JS. Tobacco smoking as a risk factor for

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
						depression. A 26-year population-based follow-up study. *J Psychiatr Res*. 2011;45(2):143-149. doi:10.1016/j.jpsychires.2010.06.006
Alcohol use & dependence[26,50]	PhenX Toolkit Alcohol – 30-Day Quantity & Frequency	30 Days Before Event (ED)	All items used from original measure with no changes	*Number of days drinking alcohol; number of drinks per day:* Open-ended integer	Continuous – **PhenX_Alc30d_QuanFreq** Quantity x Frequency of Alcohol Use [Frequency of Alcohol Use x Quantity of Alcohol Use]	Hamilton CM, Strader LC, Pratt JG, et al. The PhenX Toolkit: get the most from your measures. *Am J Epidemiol*. 2011;174(3):253-260. doi:10.1093/aje/kwr193

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Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
						Stein DJ, Karam EG, Shahly V, et al. Post-traumatic stress disorder associated with life-threatening motor vehicle collisions in the WHO World Mental Health Surveys. *BMC Psychiatry*. 2016;16:257. Published 2016 Jul 22. doi:10.1186/s12888-016-0957-8
	PROMIS Alcohol Use - Short Form 7a[13,26]	30 Days Before Event (ED)	All items used from original measure; Modified response options and time frame	*Too much time drinking; drink heavily in one sitting; drink too much; more than planned; trouble controlling; can't stop; can't get out of mind:* 0=Never; 1=Less than once a week; 2=1-2 days a week; 3=3-4 days a week; 4=Every or nearly every day	Continuous – **TooMuchDay HeavySingleSetting DrinkTooMuch MoreThanPlanned CutDown DifficultyStopping OutOfMind** Frequency of Each Alcohol Related Problem [Score of each item]	Gibbons LE, Fredericksen R, Merrill JO, et al. Suitability of the PROMIS alcohol use short form for screening in a HIV clinical care setting. *Drug Alcohol Depend*. 2016;164:113-119. doi:10.1016/j.drugalcdep.2016.04.038 Stein DJ, Karam EG, Shahly V, et al. Post-traumatic stress disorder associated with life-threatening motor vehicle collisions in the WHO World

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Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
						Mental Health Surveys. *BMC Psychiatry*. 2016;16:257. Published 2016 Jul 22. doi:10.1186/s12888-016-0957-8
Substance use & dependence[26,50]	PhenX Toolkit Substances – 30-Day Frequency	30 Days Before Event (ED)	Used 8 out of 11 items from original measure with no change in time frame or response options	*Number of days used marijuana; cocaine; hallucinogens; heroin; opiates; barbiturates; sedatives; stimulants:* Open-ended integer	Continuous – **MarijuanaNumDays** Number of Days Using Marijuana [Score of single item] **HardDrugsDays** Number of Days Using Cocaine, Hallucinogens, and Heroin [Sum of 3 items] **PrescDrugsDays** Number of Days Using Opiates, Barbiturates, Sedatives, and Stimulants [Sum of 4 items]	Hamilton CM, Strader LC, Pratt JG, et al. The PhenX Toolkit: get the most from your measures. *Am J Epidemiol*. 2011;174(3):253-260. doi:10.1093/aje/kwr193 Stein DJ, Karam EG, Shahly V, et al. Post-traumatic stress disorder associated with life-threatening motor vehicle collisions in the WHO World Mental Health Surveys. *BMC Psychiatry*. 2016;16:257. Published 2016 Jul 22. doi:10.1186/s12888-016-0957-8

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Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
Anger[26,47]	The WHO Composite International Diagnostic Interview (CIDI)	30 Days Before Event (ED)	Used 2 items from CIDI; Modified response options and time frame	*Feel irritated; So angry might explode:* 1=None of the time; 2=A little of the time; 3=Some of the time; 4=Most of the time; 5=All or almost all of the time	Continuous – **Irritated Explode** Severity of Irritability and Anger [Score of each item]	Kessler RC, Ustün TB. The World Mental Health (WMH) Survey Initiative Version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). Int J Methods Psychiatr Res. 2004;13(2):93-121. doi:10.1002/mpr.168 Stein DJ, Karam EG, Shahly V, et al. Post-traumatic stress disorder associated with life-threatening motor vehicle collisions in the WHO World Mental Health Surveys. *BMC Psychiatry*. 2016;16:257. Published 2016 Jul 22. doi:10.1186/s12888-016-0957-8
Dissociation[51,52]	Brief Dissociative Experiences Scale (DES-B) - Modified	30 Days Before Event (ED)	Used 2 out of 8 items from original measure; Modified response options and time frame	*Surroundings unreal; feel in a fog:* 1=None of the time; 2=A little of the time; 3=Some of the time; 4=Most of the time;	Continuous – **StrangeUnreal FogOrUnclear**** Severity of Each Dissociative Experience [Score of each item]	Dalenberg C, Carlson E. *Severity of Dissociative Symptoms - Adult (Brief Dissociative Experiences Scale (DES-B) – Modified).*

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Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
				5=All or almost all of the time		American Psychiatric Association: Online Assessment Measures; 2010. Available at: https://www.psychiatry.org/psychiatrists/practice/dsm/educational-resources/assessment-measures Murray J, Ehlers A, Mayou RA. Dissociation and post-traumatic stress disorder: two prospective studies of road traffic accident survivors. *Br J Psychiatry*. 2002;180:363-368. doi:10.1192/bjp.180.4.363
Rumination[53,54]	Rumination-Reflection Questionnaire – Rumination Subscale (RRQ)	30 Days Before Event (ED)	Used 3 out of 24 items from original measure; Modified response options and time frame	*Rehashed in mind; dwelt on things; played back in mind:* 1=None of the time; 2=A little of the time; 3=Some of the time; 4=Most of the time; 5=All or almost all of the time	Continuous – **RehashedThings** **DweltOnThings** **PlayBackInMind** Severity of Rumination [Score of each item]	Trapnell PD, Campbell JD. Private self-consciousness and the five-factor model of personality: distinguishing rumination from reflection. *J Pers Soc Psychol*. 1999;76(2):284-304. doi:10.1037//0022-3514.76.2.284

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Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
						Ehring T, Frank S, Ehlers A. The Role of Rumination and Reduced Concreteness in the Maintenance of Posttraumatic Stress Disorder and Depression Following Trauma. *Cognit Ther Res*. 2008;32(4):488-506. doi:10.1007/s10608-006-9089-7
General mental health[14,55]	12-Item Short Form Health Survey (SF-12)	30 Days Before Event (ED)	Used all items from original measure; Modified response options and time frame	*Emotional problems accomplish less; less careful:* 1=Yes; 0=No *Feel calm; blue:* 1=All of the time; 2=Most; 3=A good bit; 4=Some; 5=A little; 6=None	Continuous – **SF12_EmotionalAccomplish** SF12_EmotionalWorkLessCare** Role Limitations Due to Emotional Problems [Score of each item] **SF12_CalmAndPeaceful SF12_Downhearted** Mental Health [Score of each item]	Ware J Jr, Kosinski M, Keller SD. A 12-Item Short-Form Health Survey: construction of scales and preliminary tests of reliability and validity. *Med Care*. 1996;34(3):220-233. doi:10.1097/00005650-199603000-00003 Doan HTN, Hobday MB, Leavy JE, Jancey J. Health-Related Quality of Life in Motorcycle Crash Victims One Year After Injury: A Longitudinal Study in Ho Chi Minh City,

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Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
						Vietnam. *Asia Pac J Public Health*. 2020;32(2-3):118-125. doi:10.1177/1010539520912120
V. Physical health						
General health[14,55]	12-Item Short Form Health Survey (SF-12)	30 Days Before Event (ED)	Used all items from original measure; Modified response options and time frame	*Health:* 1=Excellent; 2=Very Good; 3=Good; 4=Fair; 5=Poor *Limited activity; Limited climbing stairs:* 1=Limited a lot; 2=A little; 3=Not limited at all *Physical problems accomplish less; Limited work:* 1=Yes; 0=No *Pain interfere:* 1=Not at all; 2=A little bit; 3=Moderately; 4=Quite a bit; 5=Extremely *Energy:* 1=All of the time; 2=Most; 3=A	Continuous – **SF12_Health** General Health [Score of single item] **SF12_LimitModerateActivity** **SF12_LimitClimbingStairs** Physical Functioning [Score of each item] **SF12_PhysicalAccomplished** **SF12_PhysicalLimitedInKind** Role Limitations Due to Physical Health Problems [Score of each item] **SF12_PainInterfere** Bodily Pain	Ware J Jr, Kosinski M, Keller SD. A 12-Item Short-Form Health Survey: construction of scales and preliminary tests of reliability and validity. *Med Care*. 1996;34(3):220-233. doi:10.1097/00005650-199603000-00003 Doan HTN, Hobday MB, Leavy JE, Jancey J. Health-Related Quality of Life in Motorcycle Crash Victims One Year After Injury: A Longitudinal Study in Ho Chi Minh City, Vietnam. *Asia Pac J Public Health*.

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Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
				good bit; 4=Some; 5=A little; 6=None	[Score of single item] **SF12_HaveLotsOf Energy** Vitality [Score of single item]	2020;32(2-3):118-125. doi:10.1177/1010539520912120
History of Physical illnesses/disorders[27]	Standard items	Lifetime (ED)	N/A	*Allergy (food allergies, environmental allergies, anaphylaxis, hives, other allergy); Cardiovascular (angina, atrial fibrillation, congestive heart failure, congenital heart disease, coronary artery disease, DVT, hypercholesterolemia, hypertension/high blood pressure, myocardial infarction, pulmonary embolism, stroke, supraventricular tachycardia, other vascular/ cardiac/ cerebrovascular, asthma, COPD,*	Continuous – **count_checks_phys** Number of Past Physical Disorders **count_groups_physical** Number of Broad Groups of Disorders Dichotomous – **Allergy** **Cardio** **ENT** **Hematology** **Infectious** **Neuro** **Endocrin**** **Gastro** **Onco** **MuscSkel** History of Physical Disorder [1=Yes; 0=No]	Kazantzis N, Kennedy-Moffat J, Flett RA, Petrik AM, Long NR, Castell B. Predictors of chronic trauma-related symptoms in a community sample of New Zealand motor vehicle accident survivors. *Cult Med Psychiatry*. 2012;36(3):442-464. doi:10.1007/s11013-012-9265-z

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
				idiopathic pulmonary fibrosis, rhinitis, other pulmonary); Ear Nose and Throat (benign paroxysmal positional vertigo, labyrinthitis/vestibular neuronitis, Meniere's disease, mastoiditis, chronic sinusitis, obstructive sleep apnea, other ENT); Hematology (anemia, hemophilia, polycythemia, idiopathic thrombocytopenic purpura, essential thrombocytosis, other hematology); Infectious Diseases (meningitis, HIV, tuberculosis, other infection disease);		
History of physical illnesses/disorders (continued)[27]	Standard items	Lifetime (ED)	N/A	*Neurology (bell's palsy, complex regional pain syndrome, epilepsy, migraine, MS, myasthenia gravis, narcolepsy, diabetic neuropathy, neuropathic pain, Parkinson's, tension-type headache, transverse myelitis,*	Continuous – **count_checks_phys** Number of Past Physical Disorders **count_groups_physical** Number of Broad Groups of Disorders Dichotomous – **Allergy**	Kazantzis N, Kennedy-Moffat J, Flett RA, Petrik AM, Long NR, Castell B. Predictors of chronic trauma-related symptoms in a community sample of New Zealand motor vehicle accident survivors. *Cult Med Psychiatry*. 2012;36(3):442-464.

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
				phantom limb pain, previous spinal cord injury with paraplegia, previous spinal cord injury with paraparesis, restless leg syndrome, stroke/cerebrovascular accident, other neurological); Endocrinology (Cushing's disease, diabetes, hyperthyroidism, hypothyroidism, polycystic ovary syndrome, other endocrine); Gastrointestinal (achalasia, Barrett's esophagus, celiac disease, cirrhosis liver, cirrhosis primary biliary, Crohn's, chronic abdominal pain, diverticulosis and diverticulitis, gallstones, gastritis, hemochromatosis, hepatitis chronic, hernia, IBS, liver transplant, pancreatitis, peptic ulcers, reflux esophagitis, ulcerative colitis, other GI);	**Cardio** **ENT** **Hematology** **Infectious** **Neuro** **Endocrin** **Gastro** **Onco** **MuscSkel** History of Physical Disorder [1=Yes; 0=No]	doi:10.1007/s11013-012-9265-z

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
History of physical illnesses/disorders (continued)[27]	Standard items	Lifetime (ED)	N/A	*Oncology (cancers of bladder, cervical, esophagus, head/neck, liver/pancreas, lung, ovary, stomach, other GI, uterine, Hodgkin's lymphoma, melanoma, non-Hodgkin's lymphoma, non-melanoma skin cancer, other cancer); Musculoskeletal/ rheumatology (ankylosing spondylitis, coccydynia, fibromyalgia, gout, kyphosis/lordosis, chronic low pain, lupus, chronic neck pain, osteoarthritis, osteoporosis, rheumatoid arthritis, scleroderma, chronic shoulder pain, other musculoskeletal):* 1=Selected; 0=Not selected	Continuous – **count_checks_phys** Number of Past Physical Disorders **count_groups_physical** Number of Broad Groups of Disorders Dichotomous – **Allergy** **Cardio** **ENT** **Hematology** **Infectious** **Neuro** **Endocrin** **Gastro** **Onco** **MuscSkel** History of Physical Disorder [1=Yes; 0=No]	Kazantzis N, Kennedy-Moffat J, Flett RA, Petrik AM, Long NR, Castell B. Predictors of chronic trauma-related symptoms in a community sample of New Zealand motor vehicle accident survivors. *Cult Med Psychiatry*. 2012;36(3):442-464. doi:10.1007/s11013-012-9265-z
Medications[27]	Standard items	Pretrauma (ED) Peritrauma (ED) Posttrauma (ED)	N/A	Open-ended integer/Text	Continuous - **Med_num** Number of Medications Taken Prior to ED Visit	Kazantzis N, Kennedy-Moffat J, Flett RA, Petrik AM, Long NR, Castell B. Predictors of chronic trauma-related

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
					Meds2_num_er Number of Medications Administered While in ED **Meds3_Num_Discharge** Number of Medications Taken Home at Discharge	symptoms in a community sample of New Zealand motor vehicle accident survivors. *Cult Med Psychiatry*. 2012;36(3):442-464. doi:10.1007/s11013-012-9265-z
Panic attack during sleep[56,57]	Pittsburgh Sleep Quality Index - Addendum (PSQI-A)	30 Days Before Event (ED)	Used 1 out of 7 items from original measure with no change in time frame; Modified response options	*Wake up with panic:* 0=Never; 1=Less than once a week; 2=1-2 nights a week; 3=3-4 nights a week; 4=Every or nearly every night	Continuous – **AwakeSleepWithAnxiety** Frequency of Waking Up with Panic [Score of single item]	Germain A, Hall M, Krakow B, Katherine Shear M, Buysse DJ. A brief sleep scale for Posttraumatic Stress Disorder: Pittsburgh Sleep Quality Index Addendum for PTSD. *J Anxiety Disord*. 2005;19(2):233-244. doi:10.1016/j.janxdis.2004.02.001 Bryant RA, Creamer M, O'Donnell M, Silove D, McFarlane AC. Sleep disturbance immediately prior to trauma predicts subsequent psychiatric disorder. *Sleep*. 2010;33(1):69-74.

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
						doi:10.1093/sleep/33.1.69
Insomnia[56,58]	Insomnia Severity Index (ISI)	30 Days Before Event (ED)	Used 4 out of 7 items from original measure; Modified response options and time frame	*Difficulty falling asleep; staying asleep; waking up too early*: 0=Never; 1=Less than once a week; 2=1-2 nights a week; 3=3-4 nights a week; 4=Every or nearly every night *Problems interfere:* 0=Not at all; 1=A little; 2=Somewhat; 3=A lot; 4=Extremely	Continuous – **DiffFallingAsleep DiffStayingAsleep WakeUpTooEarly** Frequency of Each Sleep Problem [Score of each item] **SleepProbInterfere** Severity of Sleep Problem [Score of single item]	Bastien CH, Vallières A, Morin CM. Validation of the Insomnia Severity Index as an outcome measure for insomnia research. *Sleep Med*. 2001;2(4):297-307. doi:10.1016/s1389-9457(00)00065-4 Bryant RA, Creamer M, O'Donnell M, Silove D, McFarlane AC. Sleep disturbance immediately prior to trauma predicts subsequent psychiatric disorder. *Sleep*. 2010;33(1):69-74. doi:10.1093/sleep/33.1.69
Chronotype[56,59]	Circadian Energy Scale (CIRENS)	General (WK2)	All items used from original measure with no changes	*Energy level in morning; Energy level in evening*: 1=Very low; 2=Low; 3=Moderate; 4=High; 5=Very high	Continuous – **CIRENS_Ener_RS** Total Energy Raw Score [Sum of 2 items] **CIRENS_Chron_RS**	Ottoni GL, Antoniolli E, Lara DR. The Circadian Energy Scale (CIRENS): two simple questions for a reliable chronotype measurement based on energy.

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Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
					Chronotype Raw Score [Subtract morning energy level score from evening energy level score] Dichotomous - **CIRENS_Morning** Morning Chronotype *(-4<= Chronotype raw score <=-2)* [1=Yes; 0=No] **CIRENS_Evening** Evening Chronotype *(2<= Chronotype raw score <=4)* [1=Yes; 0=No] **CIRENS_Neither** Neither Chronotype *(-1<= Chronotype raw score <=1)* [1=Yes; 0=No]	*Chronobiol Int*. 2011;28(3):229-237. doi:10.3109/07420528.2011.553696 Bryant RA, Creamer M, O'Donnell M, Silove D, McFarlane AC. Sleep disturbance immediately prior to trauma predicts subsequent psychiatric disorder. *Sleep*. 2010;33(1):69-74. doi:10.1093/sleep/33.1.69
Nightmares[56,60]	Clinician-Administered PTSD Scale (CAPS-IV)	30 Days Before Event (ED)	Used 2 out of 30 items from original measure; Modified response options and time frame	*Frequency of unpleasant dreams, Distress from dreams:* 0=Never; 1=Less than once a week; 2=1-2 nights a week; 3=3-4 nights a week; 4=Every or nearly every night	Continuous – **HowOftenUnpleasantDreams** **DistressUnpleasantDreams** Frequency and Severity of Nightmares [Score of each item]	Blake DD, Weathers FW, Nagy LM, et al. The development of a Clinician-Administered PTSD Scale. *J Trauma Stress*. 1995; 8(1): 75-90. Bryant RA, Creamer M, O'Donnell M, Silove D, McFarlane AC. Sleep

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
						disturbance immediately prior to trauma predicts subsequent psychiatric disorder. *Sleep*. 2010;33(1):69-74. doi:10.1093/sleep/33.1.69
Stress-induced sleep disturbance[56,61]	Ford Insomnia Response to Stress Test (FIRST)	General (ED)	Used 2 out of 9 items from original measure with no change in time frame; Modified response options	*How often had difficulty sleeping after stressful experience; after bad news:* 0=Never; 1=Rarely; 2=Sometimes; 3=Often; 4=Very often	Continuous – **SleepDifficultyStressfulExp SleepDifficultyBadNews** Difficulty Sleeping After Stress and Bad News [Score of each item]	Drake C, Richardson G, Roehrs T, Scofield H, Roth T. Vulnerability to stress-related sleep disturbance and hyperarousal. *Sleep*. 2004;27(2):285-291. doi:10.1093/sleep/27.2.285 Bryant RA, Creamer M, O'Donnell M, Silove D, McFarlane AC. Sleep disturbance immediately prior to trauma predicts subsequent psychiatric disorder. *Sleep*. 2010;33(1):69-74. doi:10.1093/sleep/33.1.69
Somnolence[56,62]	PROMIS Sleep Related Impairment - Short Form 8a	30 Days Before Event (ED)	Used 2 out of 8 items from original measure; Modified	*Difficulty staying awake:* 0=Never; 1=Less than once a	Continuous – **DiffStayAwakeInDay**	Hanish AE, Lin-Dyken DC, Han JC. *PROMIS Sleep*

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
			response options and time frame	week; 2=1-2 days a week; 3=3-4 days a week; 4=Every or nearly every day *Difficulty getting things done:* 0=Not at all; 1=A little; 2=Somewhat; 3=A lot; 4=Extremely	**SleepProbDiffGetThingsDone** Difficulty Staying Awake and Getting Things Done [Score of each item]	*Disturbance and Sleep-Related Impairment in Adolescents: Examining Psychometrics Using Self-Report and Actigraphy*. Nurs Res. 2017;66(3):246-251. doi:10.1097/NNR.0000000000000217 Bryant RA, Creamer M, O'Donnell M, Silove D, McFarlane AC. Sleep disturbance immediately prior to trauma predicts subsequent psychiatric disorder. *Sleep*. 2010;33(1):69-74. doi:10.1093/sleep/33.1.69
VII. Past 30-day role impairment						
Role impairment[15,63]	Sheehan Disability Scale (SDS)	30 Days Before Event (ED)	All items and response options used from original measure; Modified time frame	*Physical or emotional symptoms disrupt work; home; social life*: 0-10 NRS, 0=Not at all disruptive; 10=Extremely disruptive	Continuous – **DisruptWorkSchool** **DisruptFamilyHome** **DisruptSocialLife** Severity of Disruption Physical or Emotional Symptoms Cause in Each Area of Life	Leon AC, Olfson M, Portera L, Farber L, Sheehan DV. Assessing psychiatric impairment in primary care with the Sheehan Disability Scale. *Int J Psychiatry Med.* 1997;27(2):93-105.

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Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
				Days out of role; days reduced: Open-ended integer	[Score of each item] **DaysPhysicalEmotInterfere** **DaysPhysicalEmotQuality** Number of Days Absenteeism and Presenteeism [Score of each item]	Wright, K. M., Cabrera, O. A., Eckford, R. D., Adler, A. B., & Bliese, P. D. (2012). The impact of predeployment functional impairment on mental health after combat. *Psychological Trauma: Theory, Research, Practice, and Policy*, *4*(3), 260.
Social role impairment[14,55]	12-Item Short Form Health Survey (SF-12)	30 Days Before Event (ED)	Used all items from original measure; Modified response options and time frame	*Physical or emotional problems interfere with social life:* 1=All of the time; 2=Most; 3=Some; 4=A little; 5=None	**SF12_SocialInterfere** Social Functioning [Score of single item]	Ware J Jr, Kosinski M, Keller SD. A 12-Item Short-Form Health Survey: construction of scales and preliminary tests of reliability and validity. *Med Care*. 1996;34(3):220-233. doi:10.1097/00005650-199603000-00003 Doan HTN, Hobday MB, Leavy JE, Jancey J. Health-Related Quality of Life in Motorcycle Crash Victims One Year After Injury: A Longitudinal Study in Ho Chi Minh City,

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
						Vietnam. *Asia Pac J Public Health*. 2020;32(2-3):118-125. doi:10.1177/1010539520912120
VIII. Lifetime mental disorders						
History of mental disorders[27]	Standard items	Lifetime (ED)	N/A	*Acute Stress Disorder; Adjustment Disorders; Alcoholism; Anorexia Nervosa/Bulimia; Attention-Deficit/Hyperactivity Disorder; Autism Spectrum Disorder; Bipolar Disorder; Cyclothymia; Depression; Dissociative Disorders (Dissociative Amnesia, Depersonalization); Dysthymia; Generalized Anxiety Disorder; Illness Anxiety Disorder; Panic Disorder; Personality Disorder; Post-Traumatic Stress Disorder; Schizophrenia; Seasonal Affective Disorder; Sleep-*	Continuous – **count_checks_mental** Number of Past Mental Disorders Dichotomous – **Alcoholism** ADHD ASD Bipolar Depression GAD IllnessAnxietyDisorder PanicDisorder PTSD Schizophrenia SAD SubstanceAbuse OtherPsychoticDisorder** History of Mental Disorder [1=Yes; 0=No]	Kazantzis N, Kennedy-Moffat J, Flett RA, Petrik AM, Long NR, Castell B. Predictors of chronic trauma-related symptoms in a community sample of New Zealand motor vehicle accident survivors. *Cult Med Psychiatry*. 2012;36(3):442-464. doi:10.1007/s11013-012-9265-z

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Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
				Wake Disorders (Insomnia, Hypersomnia, Narcolepsy, Sleep Apnea); Social Anxiety Disorder; Somatic Symptom Disorder; Substance Abuse; Other Psychotic Disorders (Delusional Disorder, Brief Psychotic Disorder, Schizophreniform, Schizoaffective, Substance/Medication-Induced Psychotic Disorder); Other Unspecified Trauma and Stressor Related Disorder; Any other: 1=Selected; 0=Not selected		
IX. Socio-demographics						
Age[26,50]	PhenX Toolkit: Current Age	Current (ED)	All items used from original measures with no changes	*Birthdate:* Open-ended integer	Dichotomous – **Age25plus** **Age35plus** **Age50plus** Age Group [1=Yes; 0=No]	Hamilton CM, Strader LC, Pratt JG, et al. The PhenX Toolkit: get the most from your measures. *Am J Epidemiol*. 2011;174(3):253-260. doi:10.1093/aje/kwr193

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
						Stein DJ, Karam EG, Shahly V, et al. Post-traumatic stress disorder associated with life-threatening motor vehicle collisions in the WHO World Mental Health Surveys. *BMC Psychiatry*. 2016;16:257. Published 2016 Jul 22. doi:10.1186/s12888-016-0957-8
Sex[27,64]	Sex & Gender Identity Developed by The Center of Excellence for Transgender Health at the University of California San Francisco	Current (ED)	All items used from original measure; Modified response options	*Sex at birth:* 1=Male; 2=Female	Dichotomous – **Sex_Male** Male sex at birth [1=Yes; 0=No]	Cahill S, Makadon H. Sexual Orientation and Gender Identity Data Collection in Clinical Settings and in Electronic Health Records: A Key to Ending LGBT Health Disparities. *LGBT Health*. 2014;1(1):34-41. doi:10.1089/lgbt.2013.0001 Kazantzis N, Kennedy-Moffat J, Flett RA, Petrik AM, Long NR, Castell B. Predictors of chronic trauma-related symptoms in a

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
						community sample of New Zealand motor vehicle accident survivors. *Cult Med Psychiatry*. 2012;36(3):442-464. doi:10.1007/s11013-012-9265-z
Race/ethnicity[27,50]	PhenX Toolkit: Ethnicity & PhenX Toolkit: Race	Current (ED)	Used 1 out of 4 items from PhenX Toolkit: Race measure and 1 out of 3 items from PhenX Toolkit: Ethnicity measure; No change in response options	*Hispanic/Latino origin:* 1=Yes; 0=No *White; Black/African American; Asian; Native Hawaiian/Pacific Islander; American Indian/Alaska Native; Other:* 1=Selected; 0=Not selected	Dichotomous – **RaceEth_BlackNon Hispanic RaceEth_Hispanic RaceEth_Other RaceEth_White** Race/Ethnicity [1=Yes; 0=No]	Hamilton CM, Strader LC, Pratt JG, et al. The PhenX Toolkit: get the most from your measures. *Am J Epidemiol*. 2011;174(3):253-260. doi:10.1093/aje/kwr193 Kazantzis N, Kennedy-Moffat J, Flett RA, Petrik AM, Long NR, Castell B. Predictors of chronic trauma-related symptoms in a community sample of New Zealand motor vehicle accident survivors. *Cult Med Psychiatry*. 2012;36(3):442-464. doi:10.1007/s11013-012-9265-z

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Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
Marital status[26,50]	PhenX Toolkit: Current Marital Status	Current (ED)	Used 1 out of 2 items from original measure; Modified response options	*Current marital status:* 1=Married; 2=Separated; 3=Divorced; 4=Annulled; 5=Widowed; 6=Never been married *Cohabitating:* 1=Yes; 0=No	Dichotomous – **Married_Previously Married_Never Married_or_Cohab** Marital Status [1=Yes; 0=No]	Hamilton CM, Strader LC, Pratt JG, et al. The PhenX Toolkit: get the most from your measures. *Am J Epidemiol*. 2011;174(3):253-260. doi:10.1093/aje/kwr193 Stein DJ, Karam EG, Shahly V, et al. Post-traumatic stress disorder associated with life-threatening motor vehicle collisions in the WHO World Mental Health Surveys. *BMC Psychiatry*. 2016;16:257. Published 2016 Jul 22. doi:10.1186/s12888-016-0957-8
Children[26,50]	PhenX Toolkit: Household Roster - Relationships	Current (ED)	Wording from original measure was used to create 1 question	*Number of children:* Open-ended integer	Continuous – **NumberOfChildren** Number of Children	Hamilton CM, Strader LC, Pratt JG, et al. The PhenX Toolkit: get the most from your measures. *Am J Epidemiol*. 2011;174(3):253-260.

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Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
						doi:10.1093/aje/kwr193 Stein DJ, Karam EG, Shahly V, et al. Post-traumatic stress disorder associated with life-threatening motor vehicle collisions in the WHO World Mental Health Surveys. *BMC Psychiatry*. 2016;16:257. Published 2016 Jul 22. doi:10.1186/s12888-016-0957-8
Educational attainment[26,50]	PhenX Toolkit: Current Educational Attainment	Current (ED)	All items used from original measure with no changes	*Highest level of education:* 0=Never attended/kindergarten only; 1=1st grade; 2=2nd grade; 3=3rd grade; 4=4th grade; 5=5th grade; 6=6th grade; 7=7th grade; 8=8th grade; 9=9th grade; 10=10th grade; 11=11th grade; 12=12th grade, no diploma; 13=High school graduate; 14=GED or equivalent; 15=Some college, no degree; 16=Associate	Dichotomous – **EDU_CollegeGrad** **EDU_SomeCollegePlus** **EDU_HighSchoolPlus** Educational Attainment [1=Yes; 0=No]	Hamilton CM, Strader LC, Pratt JG, et al. The PhenX Toolkit: get the most from your measures. *Am J Epidemiol*. 2011;174(3):253-260. doi:10.1093/aje/kwr193 Stein DJ, Karam EG, Shahly V, et al. Post-traumatic stress disorder associated with life-threatening motor vehicle collisions in

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Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
				degree: Occupational, technical, or vocational program; 17=Associate degree: Academic program; 18=Bachelor's degree; 19=Master's degree; 20=Professional school degree; 21=Doctoral degree		the WHO World Mental Health Surveys. *BMC Psychiatry*. 2016;16:257. Published 2016 Jul 22. doi:10.1186/s12888-016-0957-8
Employment status[27,50]	PhenX Toolkit: Current Employment Status	Current (WK2)	All items used from original measure; Modified response options	*Working; Laid off; On leave because of event; On leave other; Unemployed looking for work; Retired; Disabled; Homemaker; Student; Other:* 1=Selected; 0=Not selected	Dichotomous – **Employed_Yes Employed_No** Currently Employed [1=Yes; 0=No]	Hamilton CM, Strader LC, Pratt JG, et al. The PhenX Toolkit: get the most from your measures. *Am J Epidemiol*. 2011;174(3):253-260. doi:10.1093/aje/kwr193 Kazantzis N, Kennedy-Moffat J, Flett RA, Petrik AM, Long NR, Castell B. Predictors of chronic trauma-related symptoms in a community sample of New Zealand motor vehicle accident survivors. *Cult Med Psychiatry*. 2012;36(3):442-464.

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Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
						doi:10.1007/s11013-012-9265-z
Family income[27,50]	PhenX Toolkit: Annual Family Income	Last Calendar Year (WK2)	All items used from original measure with no changes	*Total family income:* Open-ended integer	Dichotomous – **Income_Low_lt19 Income_Med_19_35 Income_High_gt35k** Total Family Income [1=Yes; 0=No]	Hamilton CM, Strader LC, Pratt JG, et al. The PhenX Toolkit: get the most from your measures. *Am J Epidemiol*. 2011;174(3):253-260. doi:10.1093/aje/kwr193 Kazantzis N, Kennedy-Moffat J, Flett RA, Petrik AM, Long NR, Castell B. Predictors of chronic trauma-related symptoms in a community sample of New Zealand motor vehicle accident survivors. *Cult Med Psychiatry*. 2012;36(3):442-464. doi:10.1007/s11013-012-9265-z
X. Social support						
Religiosity[47,65]	The WHO Composite International Diagnostic Interview (CIDI) - Religiosity Scale	General (WK2)	All items used from original measure with no change in time frame; Modified response options	*How religious/spiritual*: 0=Not at all; 1=A little; 2=Somewhat; 3=Very *Think about/seek*	Continuous – **Religiosity_RS** Religiosity Raw Score [Sum of 3 recoded items]	Kessler RC, Ustün TB. The World Mental Health (WMH) Survey Initiative Version of the World Health Organization (WHO)

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Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
				comfort through religious/spiritual when need help with decisions; help with problems: 0=Never; 1=Rarely; 2=Sometimes; 3=Often		Composite International Diagnostic Interview (CIDI). *Int J Methods Psychiatr Res*. 2004;13(2):93-121. doi:10.1002/mpr.168 Miller L, Wickramaratne P, Gameroff MJ, Sage M, Tenke CE, Weissman MM. Religiosity and major depression in adults at high risk: a ten-year prospective study. *Am J Psychiatry*. 2012;169(1):89-94. doi:10.1176/appi.ajp.2011.10121823
Social networks/social support[17,27]	Supportive and Negative Social Interaction Scale	General (WK2)	Used 6 out of 20 items from original measure with no change in time frame; Modified response options	*How often talk/hang with people, attend social groups:* 0=Never; 1=Less than once a month; 2=Once a month; 3=A few times a month; 4=A few times a week; 5=Almost every day *Number of people talk/hang at least once a month:* Open-ended integer *How much rely on*	Continuous – **AffInt_Ppl_Freq_RS** Frequency of Affiliated Interactions with Friends/Relatives [Single item converted to 0-1 scale] **AffInt_Grp_Freq_RS** Frequency of Attending Social/Religious Groups	Schuster TL, Kessler RC, Aseltine RH Jr. Supportive interactions, negative interactions, and depressed mood. Am J Community Psychol. 1990;18(3):423-438. doi:10.1007/BF00938116 Kazantzis N, Kennedy-Moffat J, Flett RA, Petrik AM, Long NR, Castell B.

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
				people for support if problem: 0=Not at all; 1=A little; 2=Some; 3=A lot *How many people could you reply on, open up to about problems:* Open-ended integer	[Single item converted to 0-1 scale] **AffInt_Ppl_Num** Number of Affiliated Interactions with Friends/Relatives [Score of single item] **SIS_NetPos_RS** Network Positive Interactions [Single item converted to 0-1 scale] **SIS_NetPos_Num** Number of Network Positive Relationships [Score of single item] **SIS_NetPos_Conf** Number of Confidants [Score of single item]	Predictors of chronic trauma-related symptoms in a community sample of New Zealand motor vehicle accident survivors. *Cult Med Psychiatry*. 2012;36(3):442-464. doi:10.1007/s11013-012-9265-z
XI. Personality						
Personality[66,67]	Big Five Inventory (BFI) - Neuroticism	General (WK2)	Used 8 out of 44 items from original measure with no change in time frame; Modified response options	*Emotionally stable; depressed; moody; relaxed; calm in tense situations; worry; get nervous; tense:* 0=Disagree strongly; 1=Disagree moderately;	Continuous – **EmotionallyStable DepressedBlue** Moody** RelaxedHandleStress RemainCalmInSituations**	John OP, Srivastava S. The Big-Five trait taxonomy: History, measurement, and theoretical perspectives. In: *Handbook of personality: Theory*

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
				2=Disagree a little; 3=Neither disagree nor agree; 4=Agree a little; 5=Agree moderately; 6=Agree strongly	**WorryALot** **NervousEasily**** **CanBeTense** Neurotic Traits [Score of each item]	*and research.* New York: Guilford Press; 1999:Vol 2 102-138. Holeva V, Tarrier N. Personality and peritraumatic dissociation in the prediction of PTSD in victims of road traffic accidents. *J Psychosom Res*. 2001;51(5):687-692. doi:10.1016/s0022-3999(01)00256-2
Personality[18,66]	Ten-Item Personality Inventory (TIPI)	General (WK2)	All items used from original measure with no changes	*Extraverted; reserved; quarrelsome; sympathetic; dependable; careless; easily upset; emotionally stable; open; uncreative:* 0=Disagree strongly; 1=Disagree moderately; 2=Disagree a little; 3=Neither disagree nor agree; 4=Agree a little; 5=Agree moderately; 6=Agree strongly	Continuous – **ExtravertEnthusiastic** **ReservedQuiet** Extraversion [Score of each item] **Quarrelsome**** **SympatheticWarm** Agreeableness [Score of each item] **Dependable** **DisorganizedCarelless** Conscientious [Score of each item] **AnxiousEasyUpset** **CalmEmoStable** Emotional Stability [Score of each item]	Gosling SD, Rentfrow PJ, Swann WB. A very brief measure of the Big-Five personality domains. *J Res Pers*. 2003;37:504-528. https://doi.org/10.1016/S0092-6566(03)00046-1 Holeva V, Tarrier N. Personality and peritraumatic dissociation in the prediction of PTSD in victims of road traffic accidents. *J Psychosom Res*. 2001;51(5):687-692.

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
					OpenToNewExperiences **Uncreative** Openness [Score of each item]	doi:10.1016/s0022-3999(01)00256-2
Anxiety sensitivity[19,68]	Anxiety Sensitivity Index (ASI)	General (WK2)	Used 3 out of 16 items from original measure with no change in time frame; Modified response options	*Worry going crazy; unusual sensations; worry mentally ill:* 0=Not at all; 1=A little; 2=Some; 3=A lot; 4=Extremely	Continuous – **WorryGoingCrazy***** **UnusualBodySensations**** **WorryMentallyIll**** Severity of Anxiety Sensitivity [Score of each item]	Rodriguez BF, Bruce SE, Pagano ME, Spencer MA, Keller MB. Factor structure and stability of the Anxiety Sensitivity Index in a longitudinal study of anxiety disorder patients. *Behav Res Ther*. 2004;42(1):79-91. doi:10.1016/s0005-7967(03)00074-3 Marshall GN, Miles JN, Stewart SH. Anxiety sensitivity and PTSD symptom severity are reciprocally related: evidence from a longitudinal study of physical trauma survivors. *J Abnorm Psychol*. 2010;119(1):143-150. doi:10.1037/a0018009
Self-efficacy/distress tolerance[20,69]	PROMIS Self-Efficacy for	General (WK2)	All items used from original measure with no change in	*Handle negative feelings; manage stress; avoid feeling*	Continuous – **HandleNegativeFeelings****	Gruber-Baldini AL, Velozo C, Romero S, Shulman LM.

eTable 1. Predictors included in the full Super Learner model predicting 3-month PTSD or MDE.

Characteristic	Measure	Reference & Survey Timepoint	Item & Response Changes	Response Options	Scored Variables	Citations
	Managing Emotions – Short Form 4a		time frame; Modified response options	*discouraged; bounce back:* 0=Not at all; 1=A little; 2=Some; 3=A lot; 4=Extremely	**FindWaysManageStress AvoidFeelingDiscouraged BounceBackDisapp** Ability to Manage Emotions [Score of each item]	Validation of the PROMIS® measures of self-efficacy for managing chronic conditions. *Qual Life Res*. 2017;26(7):1915-1924. doi:10.1007/s11136-017-1527-3 Maciejewski PK, Prigerson HG, Mazure CM. Self-efficacy as a mediator between stressful life events and depressive symptoms. Differences based on history of prior depression. *Br J Psychiatry*. 2000;176:373-378. doi:10.1192/bjp.176.4.373

eTable 1. (Continued) Predictors included in the Super Learner model predicting 3-month PTSD or MDE.

Abbreviations. ADHD, attention-deficit hyperactivity disorder; ASD, autism spectrum disorder; ASI, Anxiety Sensitivity Index; BFI, Big Five Inventory; CAPS-IV, Clinician-Administered PTSD Scale; CIDI, Compositive International Diagnostic Interview; CIRENS, Circadian Energy Scale; COPD, chronic obstructive pulmonary disease; CTQ, Childhood Trauma Questionnaire; DES, Dissociative Experiences Scale; DSM, Diagnostic and Statistical Manual of Mental Disorders; DVT, deep vein thrombosis; ED, emergency department; ENT, ear, nose, and throat; FHS, Family History Screen; FIRST, Ford Insomnia Response to Stress Test; FTND, Fagerstrom Test for Nicotine Dependence; GI, gastrointestinal; HIV, human immunodeficiency virus; ISI, Insomnia Severity Index; LEC, Lifetime Events Checklist; MCEPS, Michigan Critical Events Perception Scale; MDE, major depressive episode; MS, multiple sclerosis; OCD, obsessive compulsive disorder; PCL, Posttraumatic Stress Disorder Checklist; PCS, Pain Catastrophizing Scale; PDI, Peritraumatic Distress Inventory; PILL, Pennebaker Inventory of Limbic Languidness; PI-NRS, Pain Intensity Numeric Rating Scale; PROMIS, Patient-Reported Outcomes Measurement Information System; PSQI, Pittsburgh Sleep Quality Index; PSQI-A, Pittsburgh Sleep Quality Index-Addendum; PSS, Perceived Stress Scale; PTSD, post-traumatic stress disorder; RPQ, The Rivermead Post-

Concussion Symptoms Questionnaire; RPS, Regional Pain Scale; RRQ, Rumination-Reflection Questionnaire; SAD, seasonal affective disorder; SDS, Sheehan Disability Scale; SF-12, 12-Item Short Form Health Survey; TIPI, Ten-Item Personality Inventory.
**Indicates variables that were among the 53 predictors selected by the Super Learner model with LASSA feature selection restricted to 30 predictors.

eTable 2. Comparison of standardized baseline characteristics among patients in the analysis sample (complete cases; n=1,003) and other patients that completed the baseline assessment (incomplete cases; n=1,093)[a]

	Unweighted				Weighted[b]			
	Complete		Incomplete		Total		Complete[c]	
	Mean	SE	Mean	SE	Mean	SD	Mean	SD
I. Motor vehicle collision characteristics								
Participant's role in vehicle								
Role_Driver_Alone	.566	(.016)	.557	(.015)	.562	(.496)	.566	(.637)
Role_Driver_Others	.181	(.012)	.206	(.012)	.194	(.396)	.183	(.497)
Role_Passenger	.252	(.014)	.237	(.013)	.244	(.430)	.251	(.558)
Vehicle hit an object								
Vehicle_Hit_Movingvhcl	.664	(.015)	.673	(.014)	.669	(.471)	.660	(.609)
Vehicle_Hit_Object	.185	(.012)	.177	(.012)	.181	(.385)	.182	(.496)
Vehicle_Hit_Allothers	.151	(.011)	.150	(.011)	.150	(.357)	.158	(.469)
Severity of vehicle damage								
Vehicle_Damage_Severe	.588	(.016)	.588	(.015)	.588	(.492)	.586	(.633)
Vehicle_Damage_Moderate	.250	(.014)	.259	(.013)	.255	(.436)	.253	(.559)
Vehicle_Damage_Minor	.090	(.009)	.100	(.009)	.095	(.293)	.091	(.370)
Vehicle_Damage_Other	.072	(.008)	.053	(.007)	.062	(.241)	.070	(.328)
Number of passengers								
NumPeopleVeh	.018	(.033)	-.016	(.029)	-.000	(.996)	.006	(1.301)
Passenger injuries								
NumPeopleInj	.009	(.032)	-.008	(.029)	-.000	(.998)	.002	(1.307)
Seat belt								
No_Seatbelt	.138	(.011)	.132	(.010)	.135	(.341)	.141	(.448)
Transportation to ED								
Transport_Ambulance	.591	(.016)*	.530	(.015)	.559	(.497)	.581	(.634)
ERDirectly	.736	(.014)*	.683	(.014)	.708	(.455)	.729	(.572)
Chance of dying								
ChanceofDying	.037	(.031)	-.034	(.030)	.000	(1.000)	.002	(1.290)
Brain tissue injury								
TB_HitHead	.540	(.016)*	.497	(.015)	.518	(.500)	.542	(.641)
TB_KnockedOut	.126	(.010)	.145	(.011)	.135	(.342)	.130	(.433)
TB_Amnesia	.176	(.012)	.191	(.012)	.184	(.388)	.179	(.493)
dazed_1minplus	.183	(.012)	.195	(.012)	.189	(.392)	.186	(.501)
uncons_1minplus	.048	(.007)	.050	(.007)	.049	(.216)	.051	(.282)
TB_WhatHappened	.060	(.007)	.081	(.008)	.071	(.256)	.063	(.312)
TB_AskQuestion	.092	(.009)*	.148	(.011)	.121	(.326)	.103	(.391)
Imaging procedures								
Radiol_num	-.057	(.028)*	.052	(.028)	-.000	(.917)	-.020	(1.181)
Other procedures								
any_procedures	.059	(.007)	.059	(.007)	.059	(.235)	.061	(.309)
Number of injuried body regions								
Injury_num	-.009	(.031)	.009	(.030)	-.000	(1.000)	-.005	(1.282)
Admitted to hospital								
Admit	.045	(.007)	.057	(.007)	.051	(.220)	.045	(.266)
II. Peri- traumatic symptoms								
Global pain								
Pain	.013	(.032)	-.012	(.030)	-.000	(1.000)	-.002	(1.323)
Regional/widespread pain								
Pain_Head	-.003	(.032)	.003	(.030)	-.000	(1.000)	-.009	(1.284)

eTable 2. Comparison of standardized baseline characteristics among patients in the analysis sample (complete cases; n=1,003) and other patients that completed the baseline assessment (incomplete cases; n=1,093)[a]

	Unweighted				Weighted[b]			
	Complete		Incomplete		Total		Complete[c]	
	Mean	SE	Mean	SE	Mean	SD	Mean	SD
Pain_Neck	-.019	(.031)	.018	(.031)	.000	(1.000)	-.019	(1.269)
Pain_Jaw	.015	(.032)	-.014	(.029)	.000	(1.000)	.006	(1.304)
Pain_LeftShoulder	.002	(.032)	-.002	(.030)	-.000	(1.000)	-.005	(1.279)
Pain_RightShoulder	.004	(.032)	-.004	(.030)	.000	(1.000)	.001	(1.292)
Pain_LeftUpperArm	.023	(.032)	-.021	(.030)	-.000	(1.000)	.018	(1.299)
Pain_RightUpperArm	.026	(.032)	-.024	(.030)	.000	(1.000)	.012	(1.278)
Pain_LeftLowerArm	.004	(.031)	-.004	(.030)	-.000	(1.000)	-.002	(1.273)
Pain_RightLowerArm	.058	(.033)*	-.053	(.029)	.000	(1.000)	.034	(1.318)
PainChest	.069	(.033)*	-.063	(.029)	-.000	(1.000)	.046	(1.332)
PainUpperBack	-.008	(.032)	.008	(.030)	.000	(1.000)	-.003	(1.289)
PainLowerBack	-.037	(.032)	.034	(.030)	.000	(1.000)	-.016	(1.284)
PainAbdomen	.028	(.033)	-.026	(.029)	.000	(1.000)	.021	(1.284)
PainGenital	-.016	(.031)	.015	(.031)	-.000	(1.000)	-.006	(1.263)
PainLeftHipUpperLeg	.015	(.031)	-.014	(.030)	-.000	(1.000)	.014	(1.310)
PainRightHipUpperLeg	.012	(.032)	-.011	(.030)	.000	(1.000)	.015	(1.286)
PainLeftLowerLeg	.024	(.032)	-.022	(.030)	-.000	(1.000)	.019	(1.316)
PainRightLowerLeg	-.011	(.031)	.010	(.031)	-.000	(1.000)	-.012	(1.249)
Diff_Pain	-.007	(.032)	.006	(.030)	-.000	(1.000)	.007	(1.292)
Diff_Pain_Head	-.014	(.032)	.013	(.030)	.000	(1.000)	-.004	(1.304)
Diff_Pain_Neck	-.034	(.032)	.031	(.030)	.000	(1.000)	-.027	(1.293)
Diff_Pain_Jaw	.037	(.033)	-.034	(.029)	-.000	(1.000)	.028	(1.331)
Diff_Pain_LeftShoulder	.003	(.031)	-.003	(.031)	.000	(1.000)	.005	(1.261)
Diff_Pain_RightShoulder	-.010	(.032)	.009	(.030)	.000	(1.000)	-.003	(1.292)
Diff_Pain_LeftUpperArm	.025	(.031)	-.023	(.031)	-.000	(1.000)	.027	(1.246)
Diff_Pain_RightUpperArm	.014	(.032)	-.013	(.030)	.000	(1.000)	.006	(1.299)
Diff_Pain_LeftLowerArm	.001	(.030)	-.001	(.031)	-.000	(1.000)	-.002	(1.228)
Diff_Pain_RightLowerArm	.045	(.033)*	-.041	(.029)	-.000	(1.000)	.031	(1.320)
Diff_PainChest	.043	(.033)	-.040	(.029)	-.000	(1.000)	.029	(1.334)
Diff_PainUpperBack	-.034	(.031)	.032	(.031)	.000	(1.000)	-.017	(1.268)
Diff_PainLowerBack	-.060	(.032)*	.055	(.030)	.000	(1.000)	-.023	(1.288)
Diff_PainAbdomen	-.006	(.033)	.006	(.029)	.000	(1.000)	-.002	(1.317)
Diff_PainGenital	-.031	(.032)	.028	(.030)	-.000	(1.000)	-.019	(1.300)
Diff_PainLeftHipUpperLeg	-.006	(.032)	.006	(.030)	.000	(1.000)	.006	(1.309)
Diff_PainRightHipUpperLeg	-.000	(.032)	.000	(.030)	.000	(1.000)	.016	(1.313)
Diff_PainLeftLowerLeg	.013	(.032)	-.012	(.030)	-.000	(1.000)	.022	(1.287)
Diff_PainRightLowerLeg	-.013	(.031)	.012	(.030)	-.000	(1.000)	-.008	(1.273)
Pain catastrophizing								
PainThinkingHowMuchItHurt	.038	(.032)	-.035	(.030)	-.000	(1.000)	.010	(1.275)
PainThinkingPainToStop	.055	(.032)*	-.051	(.030)	-.000	(1.000)	.021	(1.292)
Pain interference								
PainDayToDayInterfere	.048	(.032)*	-.044	(.030)	.000	(1.000)	.011	(1.280)
PainWorkHomeInterfere	.049	(.032)*	-.045	(.030)	-.000	(1.000)	.011	(1.288)
PainSocialInterfere	.060	(.033)	-.055	(.029)	.000	(1.000)	.029	(1.306)
PainHomeChoresInterfere	.071	(.033)*	-.065	(.029)	.000	(1.000)	.035	(1.314)
Somatic symptoms								
Headache	.007	(.031)	-.006	(.030)	.000	(1.000)	.004	(1.278)

eTable 2. Comparison of standardized baseline characteristics among patients in the analysis sample (complete cases; n=1,003) and other patients that completed the baseline assessment (incomplete cases; n=1,093)[a]

	Unweighted				Weighted[b]			
	Complete		Incomplete		Total		Complete[c]	
	Mean	SE	Mean	SE	Mean	SD	Mean	SD
Dizziness	-.041	(.030)	.037	(.031)	.000	(1.000)	-.030	(1.251)
Nausea	.004	(.032)	-.004	(.030)	.000	(1.000)	.014	(1.313)
Insomnia	.012	(.032)	-.011	(.030)	.000	(1.000)	.023	(1.300)
UpsetStomach	-.002	(.032)	.002	(.030)	-.000	(1.000)	-.002	(1.291)
SensitiveSkin	.024	(.032)	-.022	(.030)	-.000	(1.000)	.019	(1.296)
RingingEars	.003	(.032)	-.003	(.030)	.000	(1.000)	.007	(1.295)
ItchyEyesSkin	.009	(.032)	-.008	(.030)	.000	(1.000)	.011	(1.309)
RacingHeart	-.006	(.031)	.006	(.030)	.000	(1.000)	-.002	(1.275)
Trembling	.030	(.032)	-.027	(.030)	.000	(1.000)	.027	(1.302)
Faint	-.047	(.030)*	.043	(.031)	-.000	(1.000)	-.017	(1.279)
Constipation	.016	(.032)	-.014	(.030)	-.000	(1.000)	.011	(1.288)
Noise	-.034	(.032)	.031	(.031)	.000	(1.000)	-.025	(1.266)
Light	-.020	(.031)	.019	(.031)	.000	(1.000)	-.013	(1.270)
Concentration	-.013	(.031)	.012	(.031)	.000	(1.000)	-.005	(1.280)
LongerThink	-.018	(.031)	.017	(.031)	-.000	(1.000)	-.010	(1.257)
BlurredVision	-.016	(.031)	.014	(.031)	-.000	(1.000)	-.007	(1.258)
DoubleVision	-.017	(.032)	.015	.030)	.000	(1.000)	-.003	(1.334)
Restlessness	-.009	(.031)	.008	(.031)	.000	(1.000)	-.006	(1.278)
Fatigue	-.028	(.031)	.026	(.031)	-.000	(1.000)	-.022	(1.265)
Diff_Headache	.003	(.031)	-.002	.030)	.000	(1.000)	.013	(1.280)
Diff_Dizziness	-.023	(.030)	.021	(.031)	.000	(1.000)	-.003	(1.234)
Diff_Nausea	.007	(.031)	-.007	(.031)	-.00	(1.000)	.024	(1.271)
Diff_Insomnia	-.027	(.031)	.024	(.030)	.000	(1.000)	.002	(1.274)
Diff_UpsetStomach	.001	(.031)	-.001	(.031)	.000	(1.000)	.008	(1.252)
Diff_SensitiveSkin	.009	(.032)	-.009	(.030)	-.000	(1.000)	.018	(1.288)
Diff_RingingEars	-.024	(.032)	.022	(.030)	-.000	(1.000)	-.012	(1.317)
Diff_ItchyEyesSkin	-.002	(.032)	.002	(.030)	.000	(1.000)	.010	(1.327)
Diff_RacingHeart	-.003	(.031)	.003	(.031)	-.000	(1.000)	.012	(1.269)
Diff_Trembling	.006	(.032)	-.005	(.030)	-.000	(1.000)	.017	(1.314)
Diff_Faint	-.034	(.030)	.031	(.031)	-.000	(1.000)	.002	(1.275)
Diff_Constipation	-.012	(.031)	.011	(.030)	.000	(1.000)	.006	(1.292)
Diff_Noise	-.043	(.031)	.040	(.031)	.000	(1.000)	-.021	(1.266)
Diff_Light	-.019	(.031	.017	(.031)	.000	(1.000)	.002	(1.270)
Diff_Concentration	-.014	(.031)	.012	(.031)	-.000	(1.000)	.006	(1.292)
Diff_LongerThink	-.026	(.030)	.024	(.031)	-.000	(1.000)	-.004	(1.266)
Somatic symptoms (continued)								
Diff_BlurredVision	-.004	(.029)	.004	(.032)	.000	(1.000)	.020	(1.198)
Diff_DoubleVision	-.013	(.029)	.012	(.032)	-.000	(1.000)	.011	(1.235)
Diff_Restlessness	-.015	(.031)	.014	(.030)	-.000	(1.000)	-.005	(1.282)
Diff_Fatigue	-.052	(.031)*	.048	(.031)	.000	(1.000)	-.030	(1.266)
Heart rate/pulse								
PulseRate	.003	(.031)	-.003	(.031)	-.000	(.999)	.003	(1.278)
Respiratory rate								
RespiratoryRate	.026	(.035)	-.024	(.027)	-.000	(1.000)	.022	(1.404)
Systolic blood pressure								
SystolicBP	.065	(.032)*	-.059	(.030)	-.000	(1.000)	.033	(1.289)

eTable 2. Comparison of standardized baseline characteristics among patients in the analysis sample (complete cases; n=1,003) and other patients that completed the baseline assessment (incomplete cases; n=1,093)[a]

	Unweighted				Weighted[b]			
	Complete		Incomplete		Total		Complete[c]	
	Mean	SE	Mean	SE	Mean	SD	Mean	SD
Diastolic blood pressure								
DiastolicBP	.064	(.031)*	-.059	(.031)	.000	(1.000)	.031	(1.246)
Shock index								
shock_index	-.040	(.031)	.037	(.031)	.000	(.999)	-.019	(1.285)
Peritraumatic distress								
PDI_Helpless	.054	(.032)*	-.050	(.030)	-.000	(1.000)	.029	(1.289)
PDI_AfraidForMySafety	.041	(.031)	-.037	(.030)	.000	(1.000)	.016	(1.276)
PDI_AboutToLoseControl	.049	(.031)*	-.045	(.031)	.000	(1.000)	.009	(1.279)
PDI_DifficultyBowel	.026	(.033)	-.024	(.029)	-.000	(1.000)	.016	(1.328)
PDI_HorrifiedByWhatHappen	.072	(.031)*	-.066	(.031)	-.000	(1.000)	.040	(1.273)
PDI_PhysicalReactions	.054	(.031)*	-.050	(.031)	-.000	(1.000)	.030	(1.254)
PDI_MightPassOut	.006	(.032)	-.006	(.030)	.000	(1.000)	-.007	(1.281)
PDI_MightDie	.046	(.032)*	-.042	(.030)	-.000	(1.000)	.014	(1.286)
Peritraumatic dissociation								
MCEPS_NoPassageTime	.011	(.032)	-.010	(.030)	.000	(1.000)	-.003	(1.286)
MCEPS_InADaze	.016	(.031)	-.015	(.030)	-.000	(1.000)	.003	(1.274)
MCEPS_WatchingSelf	-.003	(.031)	.003	(0.31)	-.000	(1.000)	-.009	(1.267)
MCEPS_SomeoneElse	.019	(.032)	-.017	(.030)	.000	(1.000)	.005	(1.287)
MCEPS_InADream	.000	(.031)	-.000	(.030)	-.000	(1.000)	-.002	(1.280)
Expectations for recovery								
DaysRecoverPhys	-.009	(.029)	.008	(.030)	.000	(.959)	-.012	(1.188)
DaysRecoverEmot	.004	(.031)	-.004	(.028)	-.000	(.952)	-.010	(1.237)
neverRecoverPhys	.030	(.005)	.032	(.005)	.031	(.173)	.030	(.218)
neverRecoverEmot	.132	(.011)	.128	(.010)	.130	(.336)	.127	(.428)
III. Recent stressors								
Chronic stress								
StressFinances	.037	(.031)	-.034	(.031)	.000	(1.000)	.022	(1.267)
StressCareer	.002	(.031)	-.002	(.031)	-.000	(1.000)	-.000	(1.267)
StressHealth	.035	(.031)	-.032	(.030)	-.000	(1.000)	.002	(1.267)
StressLoveLife	-.026	(.032)	.024	(.030)	.000	(1.000)	-.025	(1.293)
StressRelationships	.006	(.032)	-.005	(.030)	.000	(1.000)	.011	(1.297)
StressHealthOfLovedOnes	.016	(.032)	-.015	(.030)	.000	(1.000)	-.001	(1.285)
StressOthrProbLovedOnes	.027	(.032)	-.025	(.030)	.000	(1.000)	.011	(1.296)
StressProblemsWorkComm	-.027	(.030)	.025	(.032)	-.000	(1.000)	-.028	(1.217)
StressLifeOverall	-.016	(.031)	.015	(.031)	.000	(1.000)	-.004	(1.279)
Perceived stress								
FeelUpsetUnexpectedHappen	.001	(.031)	-.001	(.031)	.000	(1.000)	.002	(1.256)
UnableToControl	-.000	(.031)	.000	(.031)	.000	(1.000)	-.001	(1.261)
NervousStressed	-.018	(.031)	.017	(.031)	-.000	(1.000)	-.017	(1.277)
CouldNotCope	-.018	(.031)	.017	(.031)	-.000	(1.000)	-.019	(1.263)
AngeredOutsideControl	-.002	(.031)	.002	(.031)	.000	(1.000)	.001	(1.271)
PilingUpTooHigh	-.010	(.031)	.009	(.031)	.000	(1.000)	-.014	(1.266)
ConfidentHandleProblems	.010	(.031)	-.009	(.031)	-.000	(1.000)	.012	(1.269)
GoingMyWay	-.002	(.032)	.002	(.032)	-.000	(1.000)	-.008	(1.291)
TopOfThings	.030	(.031)	-.027	(.031)	-.000	(1.000)	.026	(1.257)
IV. Past 30- day psychological distress								

eTable 2. Comparison of standardized baseline characteristics among patients in the analysis sample (complete cases; n=1,003) and other patients that completed the baseline assessment (incomplete cases; n=1,093)[a]

	Unweighted				Weighted[b]			
	Complete		Incomplete		Total		Complete[c]	
	Mean	SE	Mean	SE	Mean	SD	Mean	SD
Post-traumatic stress disorder (PTSD)								
DisturbingMemories	-.017	(.031)	.015	(.031)	.000	(1.000)	-.014	(1.267)
FeelingUpset	-.005	(.031)	.005	(.031)	-.000	(1.000)	-.014	(1.266)
AvoidReminders	-.007	(.031)	.007	(.031)	-.000	(1.000)	-.012	(1.280)
FeelingCutOff	-.022	(.032)	.020	(.030)	-.000	(1.000)	-.008	(1.302)
FeelingIrritable	.011	(.032)	-.010	(.030)	-.000	(1.000)	-.000	(1.291)
DifficultyConcentrate	.010	(.032)	-.009	(.030)	-.000	(1.000)	-.003	(1.278)
BadDreams	.035	(.032)	-.032	(.030)	-.000	(1.000)	.034	(1.313)
RelivingEvent	.023	(.032)	-.021	(.030)	-.000	(1.000)	.009	(1.283)
StrongPhysicalReactions	.019	(.032)	-.018	(.030)	-.000	(1.000)	.009	(1.296)
AvoidStressExperience	-.007	(.031)	.007	(.030)	-.000	(1.000)	-.005	(1.284)
TroubleRemember	.011	(.031)	-.010	(.031)	-.000	(1.000)	.006	(1.268)
NoOneCanBeTrusted	-.030	(.031)	.028	(.031)	.000	(1.000)	-.018	(1.257)
BlamingSelf	.001	(.032)	-.001	(.030)	.000	(1.000)	.002	(1.300)
FeelingFear	.010	(.032)	-.010	(.030)	.000	(1.000)	-.003	(1.292)
LossOfInterest	.000	(.032)	-.000	(.030)	.000	(1.000)	-.001	(1.314)
LackPositiveEmotions	-.029	(.031)	.027	(.031)	-.000	(1.000)	-.022	(1.267)
TakingRisks	-.079	(.029)*	.073	(.032)	.000	(1.000)	-.052	(1.222)
Superalert	.021	(.031)	-.020	(.030)	-.000	(1.000)	.014	(1.283)
FeelingJumpy	.067	(.032)*	-.061	(.030)	-.000	(1.000)	.018	(1.276)
SleepProblems	.039	(.032)	-.036	(.030)	.000	(1.000)	.025	(1.288)
Depression								
Worthless	-.003	(.031)	.003	(.031)	.000	(1.000)	.002	(1.255)
NothingToLookForward	-.010	(.031)	.010	(.031)	.000	(1.000)	.001	(1.282)
Helpless	.008	(.031)	-.007	(.031)	.000	(1.000)	.005	(1.256)
Sad	-.007	(.031)	.007	(.031)	-.000	(1.000)	-.001	1.279)
Failure	-.005	(.031)	.004	(.031)	.000	(1.000)	-.001	(1.270)
Depressed	.005	(.031)	-.005	(.031)	-.000	(1.000)	.005	(1.271)
Unhappy	-.001	(.031)	.001	(.031)	.000	(1.000)	.005	(1.273)
Hopeless	.018	(.031)	-.017	(.030)	.000	(1.000)	.018	(1.273)
Mania								
WoundUp	-.028	(.030)	.026	(.031)	.000	(1.000)	-.029	(1.243)
ThoughtsRacing	-.029	(.031)	.027	(.031)	-.000	(1.000)	-.022	(1.265)
Anxiety								
Anxious	-.010	(.031)	.009	(.030)	.000	(1.000)	-.007	(1.286)
WorryAboutThings	.003	(.032)	-.003	(.030)	-.000	(1.000)	-.002	(1.290)
TroubleRelax	-.009	(.031)	.008	(.031)	-.000	(1.000)	-.010	(1.278)
Tense	.000	(.031)	-.000	(.031)	.000	(1.000)	-.004	(1.276)
Afraid	-.024	(.030)	.022	(.031)	-.000	(1.000)	-.023	(1.232)
Panic								
PanicAttack	-.015	(.031)	.013	(.031)	.000	(1.000)	-.024	(1.256)
Tobacco use & dependence								
PhenX_Tob30d_Freq	.005	(.032)	-.005	(.030)	-.000	(.997)	.022	(1.311)
Alcohol use & dependence								
PhenX_Alc30d_QuanFreq	-.003	(.034)	.003	(.028)	-.000	(.996)	.007	(1.361)
TooMuchDay	-.025	(.030)	.023	(.031)	.000	(.993)	-.016	(1.263)

eTable 2. Comparison of standardized baseline characteristics among patients in the analysis sample (complete cases; n=1,003) and other patients that completed the baseline assessment (incomplete cases; n=1,093)[a]

	Unweighted				Weighted[b]			
	Complete		Incomplete		Total		Complete[c]	
	Mean	SE	Mean	SE	Mean	SD	Mean	SD
HeavySingleSetting	-.027	(.031)	.024	(.030)	-.000	(.994)	-.012	(1.310)
DrinkTooMuch	-.031	(.030)	.028	(.031)	.000	(.993)	-.019	(1.271)
MoreThanPlanned	-.015	(.030)	.014	(.031)	-.000	(.993)	-.001	(1.272)
CutDown	-.037	(.029)	.034	(.032)	-.000	(.994)	-.024	(1.251)
DifficultyStopping	-.023	(.030)	.021	(.031)	-.000	(.994)	-.009	(1.294)
OutOfMind	-.029	(.029)	.027	(.032)	.000	(.993)	-.023	(1.209)
Substance use & dependence								
MarijuanaNumDays	-.081	(.029)*	.074	(.032)	.000	(.997)	-.043	(1.231)
HardDrugsDays	-.048	(.014)*	.044	(.039)	-.000	(.990)	-.044	(.597)
PrescDrugsDays	-.043	(.021)	.039	(.037)	-.000	(.997)	-.041	(.877)
Anger								
Irritated	.021	(.031)	-.019	(.031)	.000	(1.000)	.025	(1.272)
Explode	-.001	(.031)	.001	(.031)	-.000	(1.000)	.007	(1.266)
Dissociation								
StrangeUnreal	-.049	(.029)*	.045	(.032)	-.000	(1.000)	-.036	(1.210)
FogOrUnclear	-.036	(.029)	.033	(.032)	-.000	(1.000)	-.034	(1.195)
Rumination								
RehashedThings	.032	(.032)	-.029	(.030)	.000	(1.000)	.040	(1.304)
DweltOnThings	-.009	(.031)	.008	(.031)	.000	(1.000)	.009	(1.275)
PlayBackInMind	-.000	(.031)	.000	(.031)	-.000	(1.000)	.009	(1.270)
General mental health								
SF12_EmotionalAccomplish	.268	(.014)	.278	(.014)	.273	(.446)	.268	(.570)
SF12_EmotionalWorkLessCare	.185	(.012)	.196	(.012)	.191	(.393)	.186	(.501)
SF12_CalmAndPeaceful	-.002	(.031)	.002	(.031)	-.000	(1.000)	-.007	(1.272)
SF12_Downhearted	.017	(.031)	-.016	(.031)	-.000	(1.000)	.003	(1.270)
VI. Physical health								
General health								
SF12_Health	.063	(.031)*	-.058	(.030)	.000	(1.000)	.011	(1.275)
SF12_LimitModerateActivity	2.594	(.022)*	2.664	(.019)	2.631	(.663)	2.609	(.879)
SF12_LimitClimbingStairs	2.555	(.022)*	2.629	(.020)	2.594	(.682)	2.577	(.889)
SF12_PhysicalAccomplished	.228	(.013)	.211	(.012)	.219	(.414)	.218	(.531)
SF12_PhysicalLimitedInKind	.217	(.013)*	.156	(.011)	.185	(.388)	.204	(.518)
SF12_PainInterfere	.031	(.032)	-.028	(.030)	-.000	(1.000)	.012	(1.270)
SF12_HaveLotsOfEnergy	.061	(.031)*	-.056	(.031)	-.000	(1.000)	.036	(1.276)
History of physical illnesses/disorders								
count_checks_phys	.128	(.036)**	-.117	(.026)	-.000	(1.000)	.055	(1.372)
count_groups_physical	.133	(.035)**	-.122	(.026)	.000	(1.000)	.064	(1.359)
Allergy	.107	(.010)*	.063	(.007)	.084	(.277)	.098	(.382)
Cardio	.231	(.013)*	.171	(.011)	.200	(.400)	.209	(.523)
ENT	.043	(.006)*	.017	(.004)	.030	(.169)	.037	(.243)
Hematology	.052	(.007)	.045	(.006)	.048	(.214)	.047	(.272)
Infectious	.048	(.007)	.037	(.006)	.042	(.201)	.043	(.260)
Neuro	.187	(.012)*	.134	(.010)	.159	(.366)	.179	(.493)
Endocrin	.146	(.011)*	.087	(.009)	.115	(.319)	.131	(.433)
Gastro	.104	(.010)*	.071	(.008)	.087	(.282)	.096	(.378)
Onco	.030	(.005)	.017	(.004)	.023	(.151)	.028	(.214)

eTable 2. Comparison of standardized baseline characteristics among patients in the analysis sample (complete cases; n=1,003) and other patients that completed the baseline assessment (incomplete cases; n=1,093)[a]

	Unweighted				Weighted[b]			
	Complete		Incomplete		Total		Complete[c]	
	Mean	SE	Mean	SE	Mean	SD	Mean	SD
MuscSkel	.122	(.010)	.102	(.009)	.111		.113	(.407)
Panic attack during sleep								
AwakeSleepWithAnxiety	.015	(.032)	-.014	(.030)	-.000	(1.000)	.009	(1.288)
Insomnia								
DiffFallingAsleep	.044	(.032)	-.040	(.030)	.000	(1.000)	.026	(1.289)
DiffStayingAsleep	.059	(.032)*	-.054	(.030)	-.000	(1.000)	.042	(1.297)
WakeUpTooEarly	.051	(.032)*	-.047	(.030)	.000	(1.000)	.044	(1.289)
SleepProbInterfere	-.000	(.031)	.000	(.030)	-.000	(1.000)	-.003	(1.275)
Nightmares								
HowOftenUnpleasantDreams	.021	(.032)	-.020	(.030)	-.000	(1.000)	.012	(1.282)
DistressUnpleasantDreams	.036	(.032)	-.033	(.030)	-.000	(1.000)	.032	(1.308)
Stress-induced sleep disturbance								
SleepDifficultyStressfulExp	.051	(.031)*	-.047	(.031)	.000	(1.000)	.027	(1.270)
SleepDifficultyBadNews	.054	(.031)*	-.050	(.030)	.000	(1.000)	.030	(1.292)
Somnolence								
DiffStayAwakeInDay	.016	(.032)	-.015	(.030)	.000	(1.000)	.007	(1.285)
SleepProbDiffGetThingsDone	.012	(.032)	-.011	(.030)	.000	(1.000)	.013	(1.279)
Medications								
Med_num	.075	(.034)*	-.069	(.028)	-.000	(1.000)	.019	(1.294)
Meds2_num_er	-.039	(.024)	.035	(.034)	-.000	(.960)	-.028	(1.015)
Meds3_Num_Discharge	-.009	(.029)	.008	(.030)	.000	(.959)	-.001	(1.181)
VI. Past 30 day role impairment								
Role impairment								
DisruptWorkSchool	-.051	(.030)*	.047	(.031)	-.000	(1.000)	-.042	(1.230)
DisruptFamilyHome	-.019	(.031)	.018	(.030)	.000	(1.000)	-.012	(1.281)
DisruptSocialLife	-.005	(.032)	.004	(.030)	.000	(1.000)	.002	(1.291)
DaysPhysicalEmotInterfere	.067	(.034)*	-.061	(.027)	-.000	(1.000)	.037	(1.350)
DaysPhysicalEmotQuality	.050	(.033)*	-.046	(.029)	.000	(1.000)	.038	(1.328)
Social role impairment								
SF12_SocialInterfere	.023	(.031)	-.021	(.031)	-.000	(1.000)	.023	(1.254)
VII. Lifetime mental disorders								
History of mental disorders								
count_checks_mental	.015	(.032)	-.014	(.029)	.000	(1.000)	-.003	(1.304)
Alcoholism	.006	(.002)	.005	(.002)	.005	(.072)	.006	(.099)
ADHD	.017	(.004)	.026	(.005)	.021	(.145)	.017	(.166)
ASD	.217	(.013)	.228	(.013)	.223	(.416)	.217	(.530)
Bipolar	.022	(.005)	.019	(.004)	.021	(.142)	.021	(.184)
Depression	.106	(.005)	.088	(.009)	.096	(.295)	.100	(.385)
GAD	.057	(.007)	.048	(.007)	.052	(.223)	.053	(.287)
IllnessAnxietyDisorder	.008	(.003)	.005	(.002)	.007	(.081)	.008	(.117)
PanicDisorder	.001	(.001)*	.006	(.002)	.004	(.062)	.001	(.038)
PTSD	.013	(.004)	.011	(.003)	.012	(.109)	.012	(.141)
Schizophrenia	.006	(.002)	.005	(.002)	.005	(.072)	.006	(.096)
SubstanceAbuse	.009	(.003)	.007	(.003)	.008	(.090)	.008	(.117)
OtherPsychoticDisorder	.004	(.002)	.001	(.001)	.002	(.049)	.004	(.079)
VIII. Socio-demographics								

eTable 2. Comparison of standardized baseline characteristics among patients in the analysis sample (complete cases; n=1,003) and other patients that completed the baseline assessment (incomplete cases; n=1,093)[a]

	Unweighted				Weighted[b]			
	Complete		Incomplete		Total		Complete[c]	
	Mean	SE	Mean	SE	Mean	SD	Mean	SD
Age								
Age25plus	.297	(.014)*	.370	(.015)	.335	(.472)	.319	(.600)
Age35plus	.294	(.014)*	.225	(.013)	.258	(.438)	.280	(.577)
Age50plus	.189	(.012)**	.113	(.010)	.149	(.357)	.165	(.478)
Sex/gender								
Sex_Male	.287	(.014)**	.411	(.015)	.352	(.478)	.313	(.596)
Race/ethnicity								
RaceEth_BlackNonHispanic	.535	(.016)	.524	(.015)	.530	(.499)	.529	(.642)
RaceEth_Hispanic	.100	(.009)*	.142	(.011)	.122	(.327)	.104	(.393)
RaceEth_Other	.042	(.006)	.044	(.006)	.043	(.203)	.043	(.262)
RaceEth_White	.323	(.015)	.290	(.014)	.306	(.461)	.324	(.602)
Marital status								
Married_Previously	.144	(.011)*	.113	(.010)	.128	(.334)	.132	(.435)
Married_Never	.440	(.016)*	.487	(.015)	.464	(.499)	.458	(.641)
Married_or_Cohab	.417	(.016)	.400	(.015)	.408	(.492)	.410	(.632)
Children								
NumberOfChildren	.057	(.032)*	-.053	(.030)	-.000	(.998)	.022	(1.273)
Educational Attainment								
EDU_CollegeGrad	.212	(.013)*	.152	(.011)	.181	(.385)	.200	(.515)
EDU_SomeCollegePlus	.427	(.016)	.437	(.015)	.432	(.496)	.429	(.636)
EDU_HighSchoolPlus	.248	(.014)*	.300	(.014)	.275	(.447)	.260	(.564)

Abbreviations. SD, standard deviation; SE, standard error.

*Significant difference between the unweighted complete and incomplete samples at the subset levels, two- sided test.

**Significant at the .05 level, two- sided test, but not within 0.10 SDs of the total sample mean.

[a]In addition to completing the baseline assessment, the n=1,003 patients in the analysis sample completed all three of the 2-week, 8-week, and 3-month follow-up surveys. The remaining n=1,093 patients completed the baseline assessment but did not complete at least one of the three follow-up surveys.

[b]Weighting using a 1/p weight based on a Super Learner analysis of app baseline variables predicting whether the patient was in the analysis sample of complete cases (coded 1) or was an incomplete case (coded 0). The same algorithms were used as in the main analysis (Appendix Table 3). Our goal was to develop a weighting scheme in which the weighted mean in the analysis sample was within 0.1 standard deviation (SD) of the mean in the total sample defined in terms of the SD in the c sample. If this was not possible using a simple 1/p weight, more complex weighting schemes could have been used.[70] As shown in the table, though, this level of balance was achieved for all baseline variables using the simple 1/p weight.

[c]All complete case weighted means are within 0.10 SDs of the total sample mean.

eTable 3. Algorithms used in the Super Learner ensemble machine learning analysis[a]

Algorithm	Description
I. Super Learner	Super Learner is an ensemble machine learning approach that uses cross-validation (CV) to select a weighted combination of predicted outcome scores across a collection of candidate algorithms (learners) to yield an optimal combination according to a pre-specified criterion that performs at least as well as the best component algorithm. R package: *SuperLearner* [71,72]
II. Learners in the Super Learner library	
A. Logistic regression	Maximum likelihood estimation with logistic link function. R package: s*tats*[73]
B. Elastic Net	Elastic net is a regularization method that minimizes the problem of overlap among predictors by explicitly penalizing over-fitting with a composite penalty λ{MPP x Plasso + (1- MPP) X Pridge}, where MPP is a mixing parameter penalty with values between 0 and 1 that controls relative weighting between the lasso penalty (Plasso) and the ridge penalty (Pridge). The parameter λ controls the total amount of penalization. The ridge penalty handles multicollinearity by shrinking all coefficients smoothly towards 0 but retains all variables in the model. The lasso penalty allows simultaneous coefficient shrinkage and variable selection, tending to select at most one predictor in each strongly correlated set, but at the expense of giving unstable estimates in the presence of high multicollinearity. The elastic net approach of combining the ridge and lasso penalties has the advantage of yielding more stable and accurate estimates than either ridge or lasso alone while maintaining model parsimony. R package: *glmnet*[74] Hyperparameters: α=(0.0, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0).
C. Splines	
C1. Adaptive splines	Adaptive spline regression flexibly captures both linear and piecewise non-linear associations as well as interactions among these associations by connecting linear segments (splines) of varying slopes and smooths to create piece-wise curves (basis functions). Final fit is built using a stepwise procedure that selects the optimal combination of basis functions. R package: *earth*[75] Hyperparameters: degree = (1, 3, 5)
C2. Adaptive polynomial splines[a]	Adaptive polynomial splines are like adaptive splines but differ in the order in which basis functions (e.g., linear versus nonlinear) are added to build the final model. R package: *polspline*[76]
D. Decision trees – bagging	Random Forest. Independent variables are partitioned (based on contiguous values) and stacked to build decision trees that are combined (ensemble) to create an aggregate "forest". Random forest builds numerous trees in bootstrapped samples and generates an aggregate prediction by averaging across trees, thereby reducing over-fitting. R package: *ranger*[77] Hyperparameters: mtry = (12, 4, 20), num.trees = (2000, 2000, 2000), max.depth = (6, 8, 4), splitrule = ('gini', 'hellinger', 'extratrees')
E. Support vector machines	Support vector machines treat independent variables as dimensions in high dimensional space and attempt to identify the best hyperplane (linear,

eTable 3. Algorithms used in the Super Learner ensemble machine learning analysis[a]

Algorithm	Description
	polynomial, radial, or sigmoid kernel) to separate the sample into classes (e.g., cases and non-cases) with maximum distance between classes. R package: *WeightSVM*[78] Hyperparameters: linear, polynomial, radial, sigmoid
F. Decision trees - boosting	
F1. Gradient Boosting Machine	GBMs build a sequential ensemble of shallow successive decision trees that iteratively learn the residuals from prior trees. This is a flexible method, where the number of trees, interaction depth, and shrinkage are leveraged to build flexible models. R package: *CatBoost*[79] Hyperparameters: Iterations = (50, 100), learning rate = (0.3, 0.8), depth = (8, 10)
F2. Extreme Gradient Boosting	A fast and efficient implementation of gradient boosting. R package: *XGBoost*[80] Hyperparameters: ntrees = (1000, 100, 500, 100, 800), max_depth = (6, 2, 6, 8, 4), shrinkage = (0.001, 0.100, 0.100, 0.010, 0.001) gamma = (0.3, 0.5, 0.0, 0.5, 0.8), minobspernode = (20, 10, 20, 10, 20), colsample_bytree = (0.3, 0.8, 0.5, 0.3, 0.8)
G. Discrete Bayesian Additive Regression Trees Sampler	Bayesian trees are based on an underlying probability model (priors) for the structure and likelihood for data in terminal nodes. The aggregate tree is generated by averaging across tree posteriors (reducing overfit). R package: *dbarts*[81] Hyperparameters: sigdf = 3, sigquant = 0.90, k = 2.0, power = 2.0, base = 0.95, binaryOffset = 0.0, ntree = 200, ndpost = 1000, nskip = 100
H. Mean	Arithmetic mean

[a]Hyperparameters: Default values were used unless otherwise noted.

eTable 4. Prevalence of the outcome and of its components

	Northeast		Midwest		South		Total	
	%	(SE)	%	(SE)	%	(SE)	%	(SE)
PTSD (with or without MDE)	24.5	(2.3)	25.7	(2.2)	24.9	3.0	25.1	1.4
MDE (with or without PTSD)	11.7	(1.7)	12.6	(1.6)	9.3	1.9	11.5	1.0
PTSD or MDE	26.5	(2.4)	26.8	(2.2)	26.6	3.1	26.6	1.4
(n)	(352)		(432)		(219)		(1003)	

Abbreviations. MDE, major depressive episode; PTSD, posttraumatic stress disorder; SE, standard error.

eTable 5. Severe role impairment and days out of role among patients with 3-month comorbid PTSD-DEP compared to PTSD-alone and MDE-alone

	Severe role impairment		Number of days out of role	
	%	(SE)	Mean	(SE)
Comorbid PTSD-MDE	34.8	(4.1)	6.0	(0.8)
PTSD-alone	24.3	(3.0)	3.8	(0.7)
MDE-alone	38.1	(10.6)	7.6	(2.9)
Neither	12.5	(1.1)	2.4	(0.2)
Total	17.1	(1.0)	3.1	(0.2)
χ^2_2/F_3	19.6*		19.3*	

Abbreviations. MDE, major depressive episode; PTSD, posttraumatic stress disorder; SE, standard error.
*Significant at the .05 level, two-sided test.

eTable 6. Super Learner algorithm weights in the best model (30 variables screened in by LASSO)[1]

Algorithm	Details	Weight
SL.glmnet	alpha = 0	0.01
SL.glmnet	alpha = 0.9	0.11
SL.ranger	mtry = 4, num.trees = 2000, max.depth = 8, splitrule = 'hellinger'	0.18
Xgboost	XGBoost ntrees = 100, max_depth = 2, shrinkage = 0.1, gamma = 0.5, minobspernode = 10, colsample_bytree = 0.8	0.38
Xgboost	XGBoost ntrees = 500, max_depth = 6, shrinkage = 0.1, gamma = 0.0, minobspernode = 20, colsample_bytree = 0.5	0.32

[1]Two-part screeners were used at each 90% training sample fold, with AUC p-value > .1 as the first stage and LASSO with dfmax = 30 and minimum number of predictors = 10 applied to each algorithm and tree (catboost, dBARTs, ranger, xgboost) algorithms. Nested dichotomies of stabilized predictors as well as both stabilized and standardized versions of ordinal and interval variables were used in linear algorithms (GLM, polymarts, glmnet, earth, SVM) and only stabilized versions of ordinal and interval variables in the remaining, tree-based, algorithms. Dichotomies for categorical variables were used in all algorithms. This means that the roughly 30 predictors selected by LASSO differed within a fold depending on algorithm. Results reported here are for the final model pooled across all 3 regions. There were a total of 58 distinct predictors in this model.

eTable 7. Variation in the associations (relative risk) of respondent socio-demographic characteristics (age, sex, race-ethnicity, income) with 3-month PTSD and/or MDE in the test sample as a function of predicted probability of the outcome based on the model[a] (n=219)

Predictor	Relative Risk (95% CI)	χ^2_1
Predicted probability (PP) of the outcome based on the model	171.0 (56.7 to 516.0)	82.8
Age (50+ = 1; younger = 0)	1.0 (0.4 to 2.3)	0.0
Sex (Male = 1; Female = 0)	0.9 (0.5 to 1.9)	0.0
Race/ethnicity (Non-Hispanic White = 1; Others = 0)	1.2 (0.6 to 2.5)	0.3
Respondent income (Medium or low = 1; Others = 0)	1.2 (0.6 to 2.6)	0.4
Age (50+ = 1; younger = 0) x PP	1.3 (0.3 to 5.0)	0.2
Sex (Male = 1; Female = 0) x PP	0.9 (0.3 to 2.7)	0.0
Race/ethnicity (Non-Hispanic White = 1; Others = 0) x PP	0.9 (0.3 to 2.6)	0.1
Respondent income (Medium or low = 1; Others = 0) x PP	0.6 (0.2 to 1.9)	0.7

Abbreviations. CI, confidence interval; MDE, major depressive episode; PTSD, post-traumatic stress disorder; PP, predicted probability.

[a]Based on a robust Poisson regression model.

*Significant at the .05 level, two-sided test.

eTable 8. Zero-order associations of each predictor variable with PTSD or MDE at 3 months

	OR	(95% CI)
I. Motor vehicle collision characteristics		
Participant's role in vehicle		
Role_Driver_Alone	0.86	(0.75-0.99)*
Role_Driver_Others	1.04	(0.91-1.19)
Role_Passenger	1.14	(1.00-1.31)
Vehicle hit an object		
Vehicle_Hit_Movingvhcl	1.02	(0.88-1.17)
Vehicle_Hit_Object	1.01	(0.88-1.17)
Vehicle_Hit_Allothers	0.97	(0.84-1.11)
Severity of vehicle damage		
Vehicle_Damage_Severe	1.13	(0.98-1.30)
Vehicle_Damage_Moderate	0.97	(0.84-1.12)
Vehicle_Damage_Minor	0.94	(0.81-1.09)
Vehicle_Damage_Other	0.88	(0.76-1.03)
Number of passengers		
NumPeopleVeh	1.12	(0.98-1.27)
Passenger injuries		
NumPeopleInj	1.11	(0.97-1.28)
Seat belt		
No_Seatbelt	0.84	(0.72-0.98)*
Transportation to ED		
Transport_Ambulance	0.95	(0.83-1.09)
ERDirectly	0.93	(0.81-1.06)
Chance of dying		
ChanceofDying	1.40	(1.21-1.62)*
Brain tissue injury		
TB_HitHead	1.16	(1.01-1.34)*
TB_KnockedOut	1.18	(1.04-1.35)*
TB_Amnesia	1.16	(1.01-1.32)*
dazed_1minplus	1.12	(0.98-1.28)
uncons_1minplus	1.03	(0.90-1.18)
TB_WhatHappened	1.15	(1.01-1.31)*
TB_AskQuestion	1.08	(0.94-1.23)
Imaging procedures		
Radiol_num	1.21	(1.06-1.38)*
Other procedures		
any_procedures	0.88	(0.75-1.03)
Number of injuried body regions		
Injury_num	1.03	(0.90-1.18)
Admitted to hospital		
Admit	0.98	(0.85-1.13)

eTable 8. Zero-order associations of each predictor variable with PTSD or MDE at 3 months

	OR	(95% CI)
II. Peri-traumatic symptoms		
Global pain		
Pain	1.61	(1.37-1.88)*
Regional/widespread pain		
Pain_Head	1.37	(1.20-1.58)*
Pain_Neck	1.39	(1.20-1.60)*
Pain_Jaw	1.38	(1.21-1.57)*
Pain_LeftShoulder	1.49	(1.30-1.70)*
Pain_RightShoulder	1.35	(1.18-1.54)*
Pain_LeftUpperArm	1.47	(1.30-1.68)*
Pain_RightUpperArm	1.45	(1.27-1.65)*
Pain_LeftLowerArm	1.30	(1.14-1.48)*
Pain_RightLowerArm	1.38	(1.21-1.57)*
PainChest	1.64	(1.44-1.87)*
PainUpperBack	1.50	(1.31-1.73)*
PainLowerBack	1.47	(1.27-1.70)*
PainAbdomen	1.37	(1.20-1.56)*
PainGenital	1.26	(1.11-1.43)*
PainLeftHipUpperLeg	1.30	(1.14-1.49)*
PainRightHipUpperLeg	1.28	(1.12-1.46)*
PainLeftLowerLeg	1.34	(1.18-1.53)*
PainRightLowerLeg	1.20	(1.06-1.37)*
Diff_Pain	0.92	(0.80-1.06)
Diff_Pain_Head	1.09	(0.95-1.25)
Diff_Pain_Neck	1.02	(0.88-1.17)
Diff_Pain_Jaw	1.19	(1.04-1.36)*
Diff_Pain_LeftShoulder	1.22	(1.07-1.40)*
Diff_Pain_RightShoulder	1.14	(0.99-1.31)
Diff_Pain_LeftUpperArm	1.26	(1.11-1.45)*
Diff_Pain_RightUpperArm	1.19	(1.04-1.36)*
Diff_Pain_LeftLowerArm	1.15	(1.01-1.32)*
Diff_Pain_RightLowerArm	1.15	(1.00-1.32)*
Diff_PainChest	1.47	(1.29-1.69)*
Diff_PainUpperBack	1.24	(1.08-1.43)*
Diff_PainLowerBack	1.10	(0.96-1.27)
Diff_PainAbdomen	1.12	(0.97-1.28)
Diff_PainGenital	1.08	(0.94-1.23)
Diff_PainLeftHipUpperLeg	1.13	(0.98-1.29)
Diff_PainRightHipUpperLeg	1.05	(0.92-1.21)
Diff_PainLeftLowerLeg	1.15	(1.01-1.32)*
Diff_PainRightLowerLeg	1.04	(0.91-1.12)
Pain catastrophizing		

eTable 8. Zero-order associations of each predictor variable with PTSD or MDE at 3 months

	OR	(95% CI)
PainThinkingHowMuchItHurt	1.61	(1.41-0.84)*
PainThinkingPainToStop	1.51	(1.32-1.73)*
Pain interference		
PainDayToDayInterfere	1.60	(1.39-1.83)*
PainWorkHomeInterfere	1.58	(1.38-1.81)*
PainSocialInterfere	1.54	(1.35-1.76)*
PainHomeChoresInterfere	1.60	(1.40-1.83)*
Somatic symptoms		
Headache	1.42	(1.23-1.63)*
Dizziness	1.56	(1.36-1.78)*
Nausea	1.34	(1.18-1.53)*
Insomnia	1.63	(1.42-1.86)*
UpsetStomach	1.32	(1.16-1.50)*
SensitiveSkin	1.17	(1.02-1.34)*
RingingEars	1.36	(1.19-1.54)*
ItchyEyesSkin	1.39	(1.22-1.58)*
RacingHeart	1.66	(1.45-1.90)*
Trembling	1.71	(1.49-1.95)*
Faint	1.52	(1.33-1.73)*
Constipation	1.13	(0.99-1.28)
Noise	1.56	(1.37-1.78)*
Light	1.65	(1.44-1.89)*
Concentration	1.76	(1.54-2.02)*
LongerThink	1.75	(1.52-2.01)*
BlurredVision	1.55	(1.36-1.76)*
DoubleVision	1.34	(1.18-1.52)*
Restlessness	1.51	(1.32-1.73)*
Fatigue	1.35	(1.18-1.55)*
Diff_Headache	1.05	(0.91-1.20)
Diff_Dizziness	1.21	(1.06-1.38)*
Diff_Nausea	0.99	(0.86-1.13)
Diff_Insomnia	1.02	(0.89-1.17)
Diff_UpsetStomach	0.99	(0.87-1.14)
Diff_SensitiveSkin	0.92	(0.80-1.06)
Diff_RingingEars	1.08	(0.94-1.23)
Diff_ItchyEyesSkin	1.19	(1.03-1.36)*
Diff_RacingHeart	1.14	(1.00-1.31)
Diff_Trembling	1.17	(1.02-1.34)*
Diff_Faint	1.19	(1.04-1.36)*
Diff_Constipation	0.73	(0.63-0.85)*
Diff_Noise	1.06	(0.92-1.23)
Diff_Light	1.23	(1.07-1.41)*

eTable 8. Zero-order associations of each predictor variable with PTSD or MDE at 3 months

	OR	(95% CI)
Diff_Concentration	1.06	(0.92-1.22)
Diff_LongerThink	1.05	(0.91-1.21)
Somatic symptoms (continued)		
Diff_BlurredVision	1.15	(1.00-1.32)*
Diff_DoubleVision	1.02	(0.90-1.17)
Diff_Restlessness	0.88	(0.76-1.02)
Diff_Fatigue	0.95	(0.82-1.09)
Heart rate/pulse		
PulseRate	1.12	(0.97-1.29)
Respiratory rate		
RespiratoryRate	1.09	(0.95-1.24)
Systolic blood pressure		
SystolicBP	1.02	(0.89-1.18)
Diastolic blood pressure		
DiastolicBP	1.09	(0.95-1.25)
Shock index		
shock_index	1.09	(0.95-1.25)
Peritraumatic distress		
PDI_Helpless	1.28	(1.11-1.48)*
PDI_AfraidForMySafety	1.40	(1.21-1.62)*
PDI_AboutToLoseControl	1.37	(1.19-1.58)*
PDI_DifficultyBowel	1.16	(1.02-1.32)*
PDI_HorrifiedByWhatHappen	1.40	(1.21-1.63)*
PDI_PhysicalReactions	1.59	(1.35-1.86)*
PDI_MightPassOut	1.33	(1.16-1.52)*
PDI_MightDie	1.46	(1.28-1.66)*
Peritraumatic dissociation		
MCEPS_NoPassageTime	1.32	(1.15-1.52)*
MCEPS_InADaze	1.41	(1.22-1.62)*
MCEPS_WatchingSelf	1.42	(1.25-1.62)*
MCEPS_SomeoneElse	1.41	(1.23-1.60)*
MCEPS_InADream	1.32	(1.15-1.51)*
Expectations for recovery		
DaysRecoverPhys	1.12	(0.99-1.27)
DaysRecoverEmot	1.20	(1.05-1.37)*
neverRecoverPhys	1.11	(0.98-1.26)
neverRecoverEmot	1.18	(1.03-1.34)*
III. Recent stressors		
Chronic stress		
StressFinances	1.61	(1.40-1.86)*
StressCareer	1.54	(1.34-1.77)*
StressHealth	1.69	(1.47-1.94)*

eTable 8. Zero-order associations of each predictor variable with PTSD or MDE at 3 months

	OR	(95% CI)
StressLoveLife	1.42	(1.24-1.62)*
StressRelationships	1.69	(1.48-1.94)*
StressHealthOfLovedOnes	1.51	(1.32-1.73)*
StressOthrProbLovedOnes	1.65	(1.44-1.90)*
StressProblemsWorkComm	1.41	(1.24-1.61)*
Chronic stress (continued)		
StressLifeOverall	1.75	(1.52-2.02)*
Perceived stress		
FeelUpsetUnexpectedHappen	1.77	(1.54-2.04)*
UnableToControl	1.73	(1.51-1.99)*
NervousStressed	1.80	(1.56-2.08)*
CouldNotCope	1.64	(1.43-1.88)*
AngeredOutsideControl	1.65	(1.43-1.89)*
PilingUpTooHigh	1.70	(1.48-1.95)*
ConfidentHandleProblems	0.88	(0.76-1.01)
GoingMyWay	0.75	(0.65-0.87)*
TopOfThings	0.87	(0.75-1.00)*
IV. Prior lifetime traumatic experiences		
Childhood trauma		
ChildhoodInsults	1.50	(1.31-1.72)*
ChildhoodEmotionallyAbused	1.61	(1.40-1.85)*
ChildhoodBruises	1.28	(1.12-1.46)*
ChildhoodPhysicallyAbused	1.43	(1.26-1.63)*
ChildhoodSexualThings	1.39	(1.22-1.58)*
ChildhoodMolested	1.36	(1.19-1.55)*
ChildhoodSexuallyAbused	1.34	(1.18-1.53)*
ChildhoodFeltLoved	0.81	(0.71-0.92)*
ChildhoodFeelSpecial	0.85	(0.74-0.98)*
ChildhoodCareProtect	0.78	(0.68-0.89)*
ChildhoodTakeToDoctor	0.82	(0.72-0.94)*
Childhood bullying		
ChildhoodBullying	1.40	(1.22-1.62)*
ChildhoodHitOrHurt	1.40	(1.22-1.60)*
Previous trauma		
LT_You_NatDis	1.16	(1.02-1.33)*
LT_You_Fire	1.24	(1.09-1.41)*
LT_You_CarAccid	1.23	(1.06-1.42)*
LT_You_WorkAccid	1.29	(1.13-1.48)*
LT_You_ToxicExp	1.00	(0.87-1.15)
LT_You_PhysAssault	1.44	(1.26-1.65)*
LT_You_WeapAssault	1.31	(1.14-1.49)*
LT_You_SexAssault	1.31	(1.15-1.50)*

eTable 8. Zero-order associations of each predictor variable with PTSD or MDE at 3 months

	OR	(95% CI)
LT_You_OthSexExp	1.29	(1.13-1.48)*
LT_You_Combat	1.01	(0.88-1.16)
LT_You_Captive	1.15	(1.01-1.30)*
LT_You_Illness	1.32	(1.16-1.51)*
LT_You_HumanSuff	1.25	(1.11-1.42)*
LT_You_OthEvent	1.41	(1.23-1.62)*
LT_Wit_NatDis	1.23	(1.08-1.40)*
LT_Wit_Fire	1.11	(0.97-1.27)
Previous trauma (continued)		
LT_You_CarAccid	1.23	(1.06-1.42)*
LT_You_WorkAccid	1.29	(1.13-1.48)*
LT_You_ToxicExp	1.00	(0.87-1.15)
LT_You_PhysAssault	1.44	(1.26-1.65)*
LT_You_WeapAssault	1.31	(1.14-1.49)*
LT_You_SexAssault	1.31	(1.15-1.50)*
LT_You_OthSexExp	1.29	(1.13-1.48)*
LT_You_Combat	1.01	(0.88-1.16)
LT_You_Captive	1.15	(1.01-1.30)*
LT_You_Illness	1.32	(1.16-1.51)*
LT_You_HumanSuff	1.25	(1.11-1.42)*
LT_You_OthEvent	1.41	(1.23-1.62)*
LT_Wit_NatDis	1.23	(1.08-1.40)*
LT_Wit_Fire	1.11	(0.97-1.27)
LT_Wit_CarAccid	1.07	(0.93-1.23)
LT_Wit_WorkAccid	1.10	(0.96-1.26)
LT_Wit_ToxicExp	1.14	(1.01-1.30)*
LT_Wit_PhysAssault	1.16	(1.01-1.33)*
LT_Wit_WeapAssault	1.30	(1.14-1.48)*
LT_Wit_SexAssault	1.25	(1.10-1.41)*
LT_Wit_OthSexExp	1.23	(1.09-1.40)*
LT_Wit_Combat	1.04	(0.91-1.19)
LT_Wit_Captive	1.08	(0.95-1.22)
LT_Wit_Illness	1.20	(1.05-1.37)*
LT_Wit_HumanSuff	1.25	(1.10-1.42)*
LT_Wit_OthEvent	1.23	(1.08-1.40)*
LT_SO_NatDis	1.13	(0.99-1.29)
LT_SO_Fire	1.08	(0.94-1.24)
LT_SO_CarAccid	1.05	(0.91-1.20)
LT_SO_WorkAccid	1.14	(1.00-1.31)
LT_SO_ToxicExp	1.11	(0.98-1.27)
LT_SO_PhysAssault	1.20	(1.05-1.37)*
LT_SO_WeapAssault	1.11	(0.97-1.27)

eTable 8. Zero-order associations of each predictor variable with PTSD or MDE at 3 months

	OR	(95% CI)
LT_SO_SexAssault	1.14	(1.00-1.31)
LT_SO_OthSexExp	1.19	(1.04-1.36)*
LT_SO_Combat	1.10	(0.96-1.26)
LT_SO_Captive	1.12	(0.98-1.28)
LT_SO_Illness	1.03	(0.90-1.18)
LT_SO_HumanSuff	1.21	(1.06-1.38)*
LT_SO_OthEvent	1.14	(1.00-1.31)
LT_Job_NatDis	0.99	(0.86-1.14)
LT_Job_Fire	0.97	(0.84-1.12)
LT_Job_CarAccid	0.97	(0.84-1.12)
LT_Job_WorkAccid	0.93	(0.80-1.08)
Previous trauma (continued)		
LT_Job_ToxicExp	1.05	(0.92-1.20)
LT_Job_PhysAssault	1.07	(0.93-1.22)
LT_Job_WeapAssault	0.98	(0.86-1.13)
LT_Job_SexAssault	1.03	(0.90-1.18)
LT_Job_OthSexExp	1.09	(0.96-1.25)
LT_Job_Combat	0.99	(0.86-1.14)
LT_Job_Captive	1.09	(0.96-1.24)
LT_Job_Illness	1.02	(0.89-1.18)
LT_Job_HumanSuff	1.06	(0.93-1.21)
LT_Job_OthEvent	0.99	(0.86-1.14)
LT_You_InjHarmSO	1.23	(1.08-1.39)*
LT_Wit_ViolentDth	1.30	(1.14-1.48)*
LT_SO_ViolentDth	1.18	(1.03-1.35)*
LT_Job_ViolentDth	0.98	(0.85-1.13)
LT_Wit_AccidDth	1.24	(1.09-1.42)*
LT_SO_AccidDth	1.13	(0.98-1.29)
LT_Job_AccidDth	1.06	(0.93-1.21)
V. Past 30 day psychological distress		
Posttraumatic stress disorder (PTSD)		
DisturbingMemories	1.66	(1.45-1.91)*
FeelingUpset	1.94	(1.67-2.24)*
AvoidReminders	1.61	(1.40-1.85)*
FeelingCutOff	1.82	(1.58-2.09)*
FeelingIrritable	1.58	(1.38-1.81)*
DifficultyConcentrate	1.75	(1.52-2.01)*
BadDreams	1.59	(1.39-1.82)*
RelivingEvent	1.57	(1.37-1.79)*
StrongPhysicalReactions	1.81	(1.58-2.08)*
AvoidStressExperience	1.86	(1.61-2.14)*
TroubleRemember	1.38	(1.21-1.58)*

eTable 8. Zero-order associations of each predictor variable with PTSD or MDE at 3 months

	OR	(95% CI)
NoOneCanBeTrusted	1.52	(1.33-1.74)*
BlamingSelf	1.55	(1.36-1.78)*
FeelingFear	1.89	(1.64-2.18)*
LossOfInterest	1.85	(1.61-2.13)*
LackPositiveEmotions	1.78	(1.56-2.04)*
TakingRisks	1.35	(1.19-1.54)*
Superalert	1.35	(1.17-1.55)*
FeelingJumpy	1.68	(1.46-1.93)*
SleepProblems	1.55	(1.35-1.78)*
Depression		
Worthless	1.84	(1.60-2.11)*
NothingToLookForward	1.91	(1.67-2.20)*
Helpless	1.85	(1.61-2.12)*
Sad	1.78	(1.55-2.04)*
Depression (continued)		
Failure	1.74	(1.52-1.99)*
Depressed	2.07	(1.79-2.38)*
Unhappy	1.83	(1.59-2.10)*
Hopeless	2.06	(1.78-2.37)*
Mania		
WoundUp	1.66	(1.45-1.90)*
ThoughtsRacing	1.80	(1.57-2.06)*
Anxiety		
Anxious	1.74	(1.52-2.00)*
WorryAboutThings	1.73	(1.50-1.99)*
TroubleRelax	1.86	(1.62-2.15)*
Tense	1.84	(1.62-0.12)*
Afraid	1.95	(1.70-2.25)*
Panic		
PanicAttack	1.82	(1.58-2.08)*
Tobacco use & dependence		
PhenX_Tob30d_Freq	1.21	(1.06-1.39)*
Alcohol use & dependence		
PhenX_Alc30d_QuanFreq	1.25	(1.06-1.47)*
TooMuchDay	1.24	(1.09-1.41)*
HeavySingleSetting	1.29	(1.14-1.47)*
DrinkTooMuch	1.29	(1.14-1.47)*
MoreThanPlanned	1.26	(1.11-1.43)*
CutDown	1.32	(1.14-1.52)*
DifficultyStopping	1.31	(1.14-1.50)*
OutOfMind	1.33	(1.16-1.52)*
Substance use & dependence		

eTable 8. Zero-order associations of each predictor variable with PTSD or MDE at 3 months

	OR	(95% CI)
MarijuanaNumDays	1.23	(1.08-1.40)*
HardDrugsDays	1.02	(0.90-1.17)
PrescDrugsDays	0.99	(0.85-1.15)
Anger		
Irritated	1.70	(1.48-2.00)*
Explode	1.80	(1.57-2.07)*
Dissociation		
StrangeUnreal	1.60	(1.40-1.83)*
FogOrUnclear	1.71	(1.48-1.96)*
Rumination		
RehashedThings	1.73	(1.50-1.98)*
DweltOnThings	1.74	(1.52-1.99)*
PlayBackInMind	1.77	(1.54-2.03)*
General mental health		
SF12_EmotionalAccomplish	1.81	(1.58-2.06)*
SF12_EmotionalWorkLessCare	1.53	(1.35-1.75)*
General mental health (continued)		
SF12_CalmAndPeaceful	1.62	(1.41-1.87)*
SF12_Downhearted	0.58	(0.51-0.67)*
VI. Physical health		
General health		
SF12_Health	1.50	(1.29-1.73)*
SF12_LimitModerateActivity	0.79	(0.69-0.90)*
SF12_LimitClimbingStairs	0.84	(0.73-0.96)*
SF12_PhysicalAccomplished	1.40	(1.23-1.59)*
SF12_PhysicalLimitedInKind	1.35	(1.18-1.53)*
SF12_PainInterfere	1.48	(1.30-1.69)*
SF12_HaveLotsOfEnergy	1.41	(1.22-1.62)*
History of physical illnesses/disorders		
count_checks_phys	1.18	(1.03-1.34)*
count_groups_physical	1.17	(1.02-1.33)*
Allergy	1.15	(1.01-1.31)*
Cardio	1.10	(0.96-1.26)
ENT	0.98	(0.85-1.13)
Hematology	1.07	(0.94-1.22)
Infectious	1.12	(0.99-1.27)
Neuro	0.95	(0.82-1.09)
Endocrin	1.25	(1.10-1.42)*
Gastro	1.03	(0.90-1.18)
Onco	1.07	(0.94-1.22)
MuscSkel	1.05	(0.92-1.20)
Medications		

eTable 8. Zero-order associations of each predictor variable with PTSD or MDE at 3 months

	OR	(95% CI)
Med_num	1.08	(0.94-1.23)
Meds2_num_er	1.11	(0.97-1.30)
Meds3_Num_Discharge	1.06	(0.92-1.21)
Panic attack during sleep		
AwakeSleepWithAnxiety	1.79	(1.56-2.05)*
Insomnia		
DiffFallingAsleep	1.63	(1.42-1.88)*
DiffStayingAsleep	1.62	(1.41-1.86)*
WakeUpTooEarly	1.41	(1.23-1.62)*
SleepProbInterfere	1.58	(1.38-1.81)*
Chronotype		
CIRENS_Ener_RS	0.76	(0.66-0.88)*
CIRENS_Chron_RS	1.16	(1.01-1.34)*
CIRENS_Morning	0.96	(0.83-1.11)
CIRENS_Evening	1.01	(0.88-1.16)
CIRENS_Neither	1.02	(0.88-1.17)
Nightmares		
HowOftenUnpleasantDreams	1.67	(1.46-1.92)*
Nightmares (continued)		
DistressUnpleasantDreams	1.52	(1.32-1.73)*
Stress-induced sleep disturbance		
SleepDifficultyStressfulExp	1.67	(1.44-1.93)*
SleepDifficultyBadNews	1.82	(1.56-2.12)*
Somnolence		
DiffStayAwakeInDay	1.42	(1.24-1.62)*
SleepProbDiffGetThingsDone	1.55	(1.35-1.77)*
VII. Past 30 day role impairment		
Role impairment		
DisruptWorkSchool	1.55	(1.36-1.77)*
DisruptFamilyHome	1.71	(1.50-1.96)*
DisruptSocialLife	1.79	(1.56-2.05)*
DaysPhysicalEmotInterfere	1.36	(1.20-1.54)*
DaysPhysicalEmotQuality	1.32	(1.16-1.50)*
Social role impairment		
SF12_SocialInterfere	0.56	(0.49-0.65)*
VIII. Lifetime mental disorders		
History of mental disorders		
count_checks_mental	1.75	(1.51-2.01)*
Alcoholism	1.25	(1.04-1.49)*
ADHD	1.05	(0.93-1.20)
ASD	1.76	(1.54-2.01)*
Bipolar	1.11	(0.98-1.26)

eTable 8. Zero-order associations of each predictor variable with PTSD or MDE at 3 months

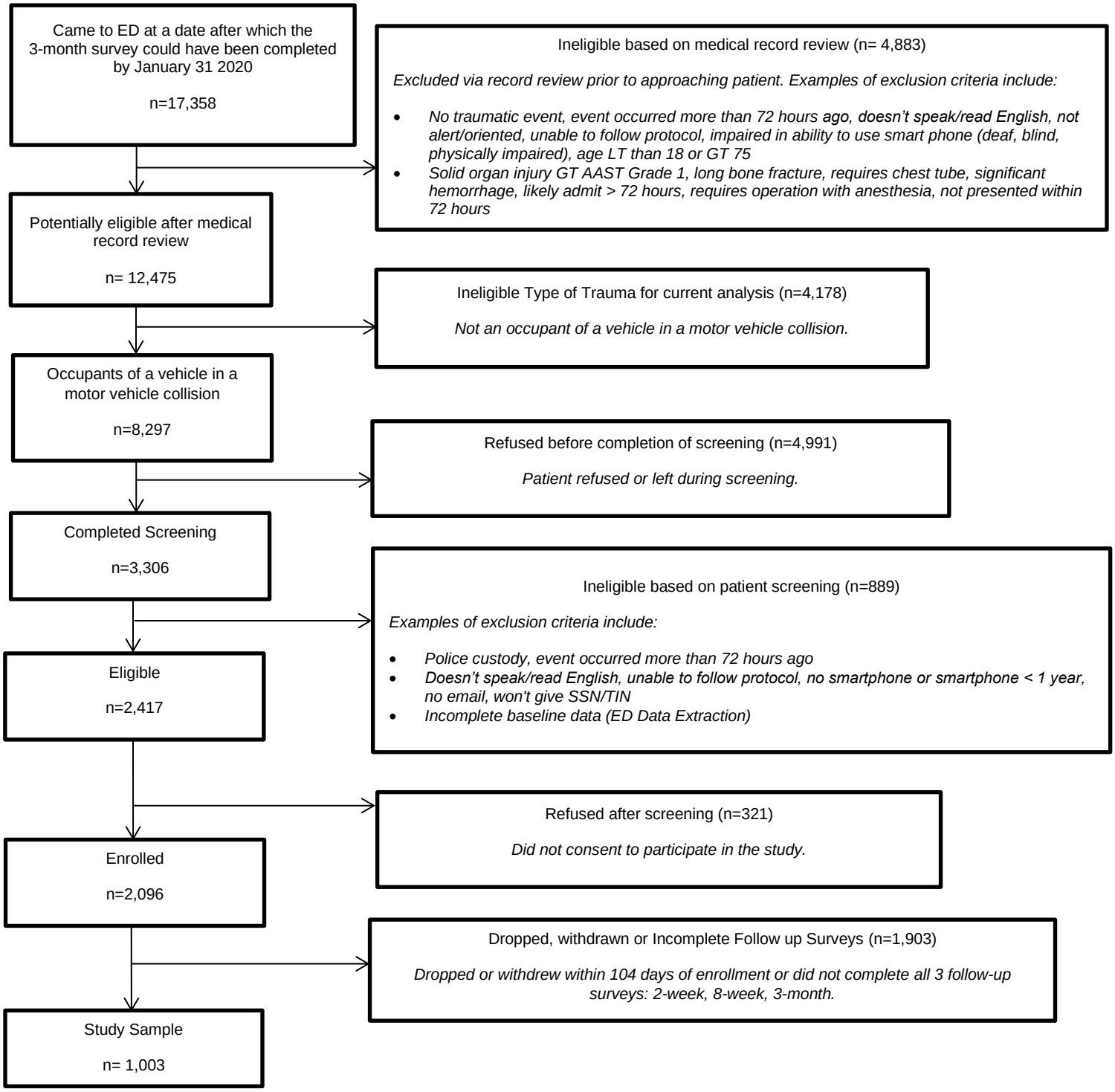
	OR	(95% CI)
Depression	1.41	(1.24-1.59)*
GAD	1.15	(1.01-1.30)*
IllnessAnxietyDisorder	1.01	(0.88-1.16)
PanicDisorder	1.51	(0.01-999.99)
PTSD	1.12	(0.99-1.27)
Schizophrenia	1.01	(0.88-1.16)
SubstanceAbuse	1.14	(1.00-1.29)*
OtherPsychoticDisorder	1.08	(0.95-1.22)
IX. Socio-demographics		
Age		
Age25plus	1.03	(0.89-1.18)
Age35plus	1.01	(0.88-1.16)
Age50plus	0.96	(0.83-1.10)
Sex		
Sex_Male	0.86	(0.74-0.99)*
Race/ethnicity		
RaceEth_BlackNonHispanic	0.96	(0.84-1.11)
RaceEth_Hispanic	1.09	(0.95-1.24)
RaceEth_Other	0.92	(0.78-1.07)
RaceEth_White	1.02	(0.89-1.17)
Marital status		
Married_Previously	1.00	(0.87-1.15)
Married_Never	0.98	(0.85-1.12)
Married_or_Cohab	1.02	(0.89-1.17)
Children		
NumberOfChildren	1.06	(0.92-1.21)
Educational Attainment		
EDU_CollegeGrad	0.89	(0.77-1.03)
EDU_SomeCollegePlus	1.01	(0.88-1.16)
EDU_HighSchoolPlus	0.93	(0.81-1.06)
Employment status		
Employed_Yes	0.81	(0.71-0.93)*
Employed_No	1.23	(1.08-1.41)*
Family income		
Income_lessthan19	1.17	(1.02-1.34)*
Income_Med_low	1.24	(1.07-1.43)*
X. Social support		
Religiousity		
Religiousity_RS	1.06	(0.92-1.22)
Social network support		
AffInt_Ppl_Freq_RS	0.86	(0.75-0.98)*
AffInt_Grp_Freq_RS	0.96	(0.83-1.10)

eTable 8. Zero-order associations of each predictor variable with PTSD or MDE at 3 months

	OR	(95% CI)
AffInt_Ppl_Num	0.77	(0.64-0.93)*
SIS_NetPos_RS	0.77	(0.67-0.88)*
SIS_NetPos_Num	0.75	(0.60-0.92)*
SIS_NetPos_Conf	0.64	(0.51-0.81)*
XI. Personality		
Personality		
EmotionallyStable	0.68	(0.59-0.79)*
DepressedBlue	2.31	(1.98-2.71)*
Moody	1.64	(1.40-1.92)*
RelaxedHandleStress	0.57	(0.49-0.66)*
RemainCalmInSituations	0.73	(0.64-0.84)*
WorryALot	1.82	(1.55-2.13)*
NervousEasily	2.00	(1.71-2.33)*
CanBeTense	1.74	(1.49-2.03)*
ExtravertEnthusiastic	0.89	(0.78-1.03)
ReservedQuiet	1.13	(0.99-1.31)
Quarrelsome	1.68	(1.46-1.93)*
SympatheticWarm	0.88	(0.77-1.01)
Dependable	0.92	(0.80-1.05)
DisorganizedCareless	1.53	(1.34-1.76)*
AnxiousEasyUpset	1.96	(1.68-2.28)*
CalmEmoStable	0.65	(0.57-0.75)*
Personality (continued)		
OpenToNewExperiences	0.86	(0.75-0.99)*
Uncreative	1.33	(1.16-1.52)*
Anxiety sensitivity		
WorryGoingCrazy	2.24	(1.94-2.59)*
UnusualBodySensations	2.36	(2.03-2.76)*
WorryMentallyIll	2.13	(1.85-2.45)*
Self-efficacy/distress tolerance		
HandleNegativeFeelings	0.67	(0.58-0.77)*
FindWaysManageStress	0.77	(0.67-0.88)*
AvoidFeelingDiscouraged	0.79	(0.69-0.91)*
BounceBackDisapp	0.69	(0.60-0.79)*

Abbreviations. MDE, major depressive episode; PTSD, posttraumatic stress disorder.
*Significant zero-order association at the .05 level, two-sided test.

eFigure 1. Flowchart of patients reviewed in records at the participating EDs as of 1/31/2020.



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TRIPOD Checklist

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. • Our title identifies the study as developing and validating a prediction model for PTSD and major depression. We do not include information on the target population in the title due to character limits for the title, but this information is in the abstract and in the manuscript.	1
Abstract	2	D;V	Provide a summary of objectives, study design, setting, participants, sample size, predictors, outcome, statistical analysis, results, and conclusions. • We included all of these other than predictors due to the journal restriction on abstract length and journal instructions for which sections to include in the abstract. A 25-page table (eTable 1) describes predictors.	6
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. • Introduction	8-9
	3b	D;V	Specify the objectives, including whether the study describes the development or validation of the model or both. • We are clear in the title that the study describes both development and validation. The introduction also describes these objectives.	8-9
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. • Sample section	9-10
	4b	D;V	Specify the key study dates, including start of accrual; end of accrual; and, if applicable, end of follow-up. • Sample section	9-10
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. • Sample section.	9-10
	5b	D;V	Describe eligibility criteria for participants. • Sample section	9-10
	5c	D;V	Give details of treatments received, if relevant. • NA	NA
Outcome	6a	D;V	Clearly define the outcome that is predicted by the prediction model, including how and when assessed. • Measures section	10-11
	6b	D;V	Report any actions to blind assessment of the outcome to be predicted. • Measures section. Outcomes were self-report.	10-11
Predictors	7a	D;V	Clearly define all predictors used in developing or validating the multivariable prediction model, including how and when they were measured. • We give a brief overview of the predictors used in the machine learning prediction models in the Predictors subsection. Since we included 394 potential predictors, we described the predictors thoroughly in eTable 1 due to word limit constraints in the manuscript. This eTable 1 includes information on when the variable was assessed (in the ED, 2-week follow-up, or 8-week follow-up survey), the measures used, questions asked, and how variables were scored to be included in the analysis.	10
	7b	D;V	Report any actions to blind assessment of predictors for the outcome and other predictors. • Measures section. Predictors were self-report.	10
Sample size	8	D;V	Explain how the study size was arrived at. • Sample section	9
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. • Analysis methods section describes use of propensity score weight for case-missing data. • The analysis methods section describes that we used mean imputation for the small amount of item-missing data.	11

Statistical analysis methods	10a	D	Describe how predictors were handled in the analyses. • Analysis methods section describes transformations used in the machine learning models. eTable 1 provides a detailed description of predictor scoring.	10
	10b	D	Specify type of model, all model-building procedures (including any predictor selection), and method for internal validation. • Analysis methods section	11-13
	10c	V	For validation, describe how the predictions were calculated. • Analysis methods section	11-13
	10d	D;V	Specify all measures used to assess model performance and, if relevant, to compare multiple models. • Analysis methods section AUC, SN, PPV, calibration	12-13
	10e	V	Describe any model updating (e.g., recalibration) arising from the validation, if done. • Analysis methods section describes calibration	11-13
Risk groups	11	D;V	Provide details on how risk groups were created, if done. • NA	NA
Development vs. validation	12	V	For validation, identify any differences from the development data in setting, eligibility criteria, outcome, and predictors. • Sample section and analysis methods section	9-11
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. • A study flowchart is provided in eFigure 1 • The prevalence of the outcome is given in the Results section	13-14
	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. • First subsection of the methods section • Item missing data was minimal and this is stated in the analysis methods section	9,13
	13c	V	For validation, show a comparison with the development data of the distribution of important variables (demographics, predictors and outcome). • We report outcome prevalence by region of the country, which we used to define training and test samples. However, we report baseline predictor distributions only for the total sample (eTable 2)	13,15
Model development	14a	D	Specify the number of participants and outcome events in each analysis • Sample and analysis methods sections.	10,12
	14b	D	If done, report the unadjusted association between each candidate predictor and outcome. • Zero-order associations of each predictor with the outcome are in eTable 8	16
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). • The model is a black box ensemble machine learning model. Coefficients cannot be shown. However, we use the Kernel SHAP model agnostic method of evaluating predictor importance to provide information of the 53 predictors in the model.	16
	15b	D	Explain how to use the prediction model. • We explain how the model can be used to detect those at high risk of the outcome by describing the model predictions (PPV, SN) for the top 29% of patients at highest risk as determined by the model	15
Model performance	16	D;V	Report performance measures (with CIs) for the prediction model. • We report test sample AUC, SN, PPV, calibration and their standard errors.	14-15
Model-updating	17	V	If done, report the results from any model updating (i.e., model specification, model performance). • NA	NA
Discussion				
Limitations	18	D;V	Discuss any limitations of the study (such as nonrepresentative sample, few events per predictor, missing data). • Discussion section	18
Interpretation	19a	V	For validation, discuss the results with reference to performance in the development data, and any other validation data. • Results and discussion sections	14-16

	19b	D;V	Give an overall interpretation of the results, considering objectives, limitations, results from similar studies, and other relevant evidence. • Discussion section	16-18
Implications	20	D;V	Discuss the potential clinical use of the model and implications for future research. • Discussion section.	16-18
Other information				
Supplementary information	21	D;V	Provide information about the availability of supplementary resources, such as study protocol, Web calculator, and data sets. • NA	NA
Funding	22	D;V	Give the source of funding and the role of the funders for the present study. • FN to title page	19

