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Wójcik, Z., Dimitrova, V. orcid.org/0000-0002-7001-0891, Warrington, L. orcid.org/0000-0002-8389-6134 et al. (2 more authors) (2024) Patient-Centric Approach for Utilising Machine Learning to Predict Health-Related Quality of Life Changes During Chemotherapy. In: Finkelstein, J., Moskovitch, R. and Parimbelli, E., (eds.) Artificial Intelligence in Medicine. 22nd International Conference, AIME 2024, 09-12 Jul 2024, Salt Lake City, UT, USA. Lecture Notes in Computer Science, 14844 . Springer Nature , pp. 101-116. ISBN 978-3-031-66538-7

https://doi.org/10.1007/978-3-031-66538-7_12

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Patient-Centric Approach for Utilising Machine Learning to Predict Health-Related Quality of Life Changes during Chemotherapy

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Abstract. Patients undergoing chemotherapy often experience adverse effects, which can lead to changes in health-related quality of life (HRQOL) and have detrimental effects on patients' physical and psychological wellbeing. This study aims to apply machine learning (ML) models to patientreported, clinical, and demographic data to predict changes in physical well-being, social functioning, role functioning, usual activities, and mobility at 6, 12 and 18 weeks from starting chemotherapy. A patient-centric approach is followed as outcome variables were selected after consultation with patients and a clinician, who also was involved in the study design. Logistic regression, random forest, extreme gradient boosting, and multilayer perceptron were developed and their performance of predicting improvement and deterioration in HRQOL was evaluated with accuracy, recall, specificity, and area under the ROC curve (AUC). Model performance was generally better when predicting improvement, with best models giving AUC of 0.904 for predicting mobility improvement at 12 weeks and AUC of 0.898 for predicting usual activities improvement at 18 weeks. The results encourage involving stakeholders in research and support the view that ML can be used to predict outcomes meaningful to patients. They also highlight that although some outcome variables can be valuable for patients, they may not be predicted well by ML models. This study can inform future work on patient-centric ML methods contributing to treatment decisions in oncology.

Keywords: Machine Learning · Patient-Centric Approach · Patient-Reported Data · Cancer Outcomes · Health-Related Quality Of Life

1 Introduction

Cancer diagnosis can be devastating for an individual and lead to emotional distress, anxiety or depression. Patients are usually faced with the immediate need to make a treatment decision, which is a daunting and complicated process due to serious adverse effects of chemotherapy. Often the treatment choice requires compromising between the quality of life and the length of life [1]. There are many existing studies on cancer survival analysis, but health-related quality of life (HRQOL) changes require more consideration in literature. Understanding factors related with increased chemotherapy toxicity and HRQOL fluctuations could personalise cancer care through enabling informed shared decision-making process and early preparation for potential adverse effects [2].

Machine learning (ML) has been successful in predicting patient outcomes in healthcare [3], but ML models are often built on clinical and demographic data, overlooking patients' views. Patient-reported outcome measures (PROMs) are questionnaires collecting patients' perception on their own health status, unaffected by clinical opinion [4]. PROMs added as input data in ML models have a potential to improve their predictive performance [5]. Furthermore, patients' perspective is often missed from the study design process. Therefore, the development of new ML models might not serve its purpose or address needs of diverse groups of people in an equal and fair way. Patient-centric research is also crucial for building public trust in artificial intelligence and support the implementation of the studied tools in clinical practice [6].

There is existing evidence that ML can predict chemotherapy toxicity, but research papers often focus on acute hospital utilisation during treatment, rather than HRQOL [7]. Studies foreseeing HRQOL during chemotherapy tend to use statistical modelling, rather than explore ML predictive opportunities [8]. Furthermore, the outcomes are usually limited to specific time during the chemotherapy, without investigating the changes from early to late stages of the treatment [9]. Patient and clinician involvement is also missing from the study design.

This study is a part of a broader research on using PROMs and ML to predict patient outcomes. In earlier work we have shown that baseline PROMs can predict hospital utilisation and treatment management [7]. In this paper we focus on predicting patients' quality of life changes during chemotherapy following a patient-centric study design. The study utilises PROMs in ML models to predict changes in physical well-being, social functioning, role functioning, usual activities, and mobility at 6, 12 and 18 weeks of chemotherapy. The paper ensures rigorous reporting of model development and evaluation, supporting reproducibility of research [10]. Stakeholder engagement was an essential part of the study design and model evaluation.

2 Methods

2.1 Overall Methodology

Four machine learning models: logistic regression (LR), random forest (RF), extreme gradient boosting (XGB), and multilayer perceptron (MLP) were used to predict patient-reported HRQOL changes at 6, 12 and 18 weeks of starting chemotherapy treatment. The overall study design is presented in Fig. 1.



Fig. 1. Flow diagram illustrating the overall methodology of the study.

2.2 Patient-Centric Approach

A consultation with patient representatives was a part of a Data-driven Cancer Research Conference 2024 in Manchester, UK, where initial study design was presented. Two of the patient representatives were asked which chemotherapy effects would be the most helpful to be aware of before treatment decisions. Patients stressed that apart from physical symptoms, they would like to understand how chemotherapy would impact their every-day activities and social life. Consequently, these aspects were selected as outcome variables in this study.

The patients' perspective was further considered, as a clinical oncologist was involved in all stages of the study. Patient Centred Outcomes Research (PCOR) Group at the Leeds Institute of Medical Research, University of Leeds, St James's University Hospital, a multidisciplinary research group, which includes oncologists, nurses and psychologists, was also consulted during earlier project stages. Following discussions with the group, the study includes feature importance analysis and ML model evaluation on original (unprocessed) data.

2.3 Dataset

The dataset contains data from 508 patients initiating chemotherapy for colorectal, breast, or gynecological cancers at Leeds Cancer Centre, collected in a prospective, randomized two-arm parallel group study, called eRAPID clinical trial [11]. It consists of 90 variables, 42 of which are demographic (self-reported) and clinical (from Electronic Healthcare Records). They include age at study entry, sex, marital status, level of education, employment status, body mass index (BMI), disease site (breast/gynecological/colorectal), previous chemother-

apy (yes/no), disease type (metastatic/non-metastatic), and comorbidities presence: cardiovascular, respiratory, gastrointestinal, stomach/intestine, endocrine, renal, neurological, rheumatologic, previous malignancy, substance abuse. The remaining 48 variables consist of PROMs, completed by participants at 4 timepoints (baseline at the start of the trial, and at 6-, 12-, and 18-week follow-up). For each time-point, 6 variables were from Five-dimensional Visual Analogue Scale (EQ-5D-VAS [12]), including self-reported data on mobility, self-care, usual activities, pain/discomfort, anxiety/depression, and self-rated health status; 4 variables from Functional Assessment of Cancer Therapy - General 28 items (FACT-G [13]), including aggregated scores of physical, social, emotional and functional well-being; and 2 remaining variables were social and role scale from EORTC Core Quality of Life Questionnaire (QLQ-C30 [14]).

2.4 Feature Engineering

The outcome variables were improvement and deterioration in: physical wellbeing (physical symptoms), social functioning (ability to engage in the society), role functioning (ability to perform life roles), usual activities (ability to perform daily life activities), and mobility (ability to move) at 6, 12 and 18 weeks. Baseline values were subtracted from the values at the predicted time point. The improvement and deterioration were transformed into binary variables with the threshold of minimally clinically important difference (MCID) [15,16] for physical well-being, social functioning and role functioning to ensure clinical relevance. Usual activities and mobility were 5-level, 1-item scale (from no problems to extreme problems) and have no MCID recommendations, so the deterioration and improvement of these variables were considered any change of ≤ 1 and ≤ -1 respectively (Table 1). Input features are described in *Dataset* subsection. Features correlated with Pearson coefficient higher than 0.6 were removed (leaving one) to ensure ML models process information efficiently. The list of removed variables in each feature set is presented in the Appendix Table 2.

2.5 Data Pre-Processing

Continuous variables were standardised. Only rows (participants) with complete target variable at the predicted time point were included in the analysis. Any missing data were imputed using KNN imputer (k=5) [17]. The number of missing data for each variable in each outcome is presented in Appendix Table 3. The data was split with to stratification train (80%) and test (20%). Random sampling with replacement was performed on training set to ensure that models are not biased towards one class [18]. Test set was left imbalanced and models were evaluated on unprocessed data to have a potential to be applied to clinical practice. Original class distribution is provided in Table 1.

2.6 Model Development and Evaluation

LR, RF, XGB and MLP were applied using Python sklearn library to predict each target variable at each time point. The model selection was based on their

HRQOL	Questionnaire	Deterioration	Improvement	Time point (N, D, I)
				6 weeks (N=439, D=252, I=68)
Physical well-being	Fact-G	change ≤ -2	change ≥ 2	12 weeks(N=400, D=241, I=51)
				18 weeks (N=382, D=219, I=58)
				6 weeks (N=440, D=187, I=101)
Social functioning	QLQ-C30	change ≤ -7	change ≥ 8	12 weeks (N=407, D=209, I=73)
				18 weeks (N=388, D=179, I=90)
				6 weeks (N=438, D=190, I=100)
Role functioning	QLQ-C30	change ≤ -6	change $\geq 11^*$	12 weeks (N=407, D=216, I=90)
				18 weeks (N=385, D=171, I=78)
				6 weeks (N=439, D=148, I=71)
Usual activities	EQ-5D-VAS	change ≥ 1	change ≥ -1	12 weeks (N=408, D=181, I=50)
				18 weeks (N=384, D=183, I=51)
				6 weeks (N=438, D=64, I=48)
Mobility	EQ-5D-VAS	change ≥ 1	change ≥ -1	12 weeks (N=408, D=98, I=40)
				18 weeks (N=382, D=122, I=31)

Table 1. Predicted variables, questionnaires completed, change calculations, participants number (N), including deterioration (D) and improvement (N) cases.

*MCID for role functioning improvement was the average from all cancer types due to availability [16].

frequency of use in studies applying ML to PROMs data to enable betweenstudies comparison. Hyperparameters were tuned on training sets through grid search with five-fold cross-validation. The models were evaluated with accuracy, recall (also known as sensitivity), specificity and area under the ROC curve (AUC). Feature importance was also conducted on LR and RF models predicting 3 best performing outcomes at 18 weeks due to their explainability potential. Furthermore, Analysis of Variance (ANOVA) with Tukey's Honest Significant Difference (Tukey HSD) tests were performed to compare model performances.

3 Results

Accuracy, recall, specificity and AUC of all models are provided in Appendix Tables 4 and 5. The plots in Fig. 2 represent AUCs of all target variables apart from role functioning, due to its similarity to usual activities, but worse performance.

3.1 Predicted HRQOL Changes

Physical Well-Being. Deterioration: LR models had the highest AUCs at 6 (0.710), 12 (0.661) and 18 (0.761) weeks deterioration predictions. Even though LR did not provide the highest recall, it did not compromise the specificity unlike other models (e.g., MLP at 6 weeks: recall=0.902, specificity=0.162), preventing false negative predictions. All models had the best performance predicting deteriorations at 18 weeks, compared to 6 and 12 weeks. *Improvement:* MLP had the highest AUC overall at 12 weeks (0.843). This model also had high recall (0.800) and specificity (0.886). LR had the highest performance at 6 (AUC=0.718) and 18 weeks (AUC=0.662). Generally all models had poor recall (risking false improvement predictions), apart from LR (0.800) and aforementioned MLP (0.800) predicting improvement at 12 weeks. The models performed the best at 12 weeks, except for RF achieving highest AUC at 6 weeks.

Social Functioning. Deterioration: Overall, the best performing model was LR with highest AUC of 0.685 at 18 weeks. MLP was the best classifier at 6 weeks (AUC=0.595), and LR at 12 weeks (AUC=0.562). The models were compromising either specificity or recall, with at least one of them being lower than 0.600. Overall, 18 weeks deterioration predictions had highest AUC for all models except MLP (highest AUC of 0.595 at 6 weeks). *Improvement:* The best performing model was MLP at 6 (AUC=0.713), 12 (AUC=0.533) and 18 (AUC=0.736) weeks. These models also had highest recall, which was 0.750 at 6 weeks and 0.722 at 18 weeks with specificity being respectively 0.676 and 0.750. The MLP's recall at 12 weeks was only 0.200, suggesting a bad performance of this model. RF had the highest specificity for all time points, but compromised recall. All models achieved best predictive performance at 18 weeks.

Role Functioning. Deterioration: LR outperformed other models, achieving the highest AUCs at all time points: 6 (0.573), 12 (0.691) and 18 (0.675) weeks. Recalls of these models were higher than specificity, with the highest value at 12 weeks (0.750). The models had best overall performance at 18 weeks, even though LR was slightly better at 12 weeks. *Improvement:* LR had the highest AUCs of all models at 6 (0.531) and 18 weeks (0.770), whilst MLP at 12 weeks (0.712). LR's performance at 18 weeks was the highest overall. This model also had the highest recall (0.688), but specificity of 0.852 was lower than XGB's specificity (0.902). Overall, models performed the best at 18 weeks (except MLP with the highest AUC=0.712 at 12 weeks) and the worst at 6 weeks.

Usual Activities. Deterioration: The best performing model was LR at 6 (AUC=0.663) and 12 weeks (AUC=0.739), and MLP (AUC=0.718) at 18 weeks. These models also had highest recall, but not specificity, which was the highest for RF (6 and 12 weeks) and XGB (18 weeks). In general, specificity was a lot higher than recall. The models had the lowest performance at 6 weeks, while 12 and 18 weeks predictions had similar performance. *Improvement:* LR outperformed all models at all time points with AUCs of 0.684 (6 weeks), 0.731 (12 weeks), and 0.898 (18 weeks). LR at 18 weeks was the highest performing model with excellent recall (0.900) and specificity (0.896). The specificity of all models was high, but often compromised recall. Models predicting 18 weeks improvement performed much better than models at other time points.

Mobility. Deterioration: The models had poor overall performance with MLP having the highest AUCs at 6 (0.529) and 12 (0.562) weeks, and LR (0.597) at 18 weeks. Recall of the models was poor as well, with the highest value of 0.560. Specificity values of the models were good overall, with the highest for RF at 6 weeks (0.973). It is unclear which time point resulted in the best predictions. *Improvement:* MLP was the best performing model overall achieving AUC of 0.904 (recall=0.875, specificity=0.932) at 12 weeks. LR was the best models at 6 weeks (AUC=0.829) with very good recall (0.800) and specificity (0.859). At 18

weeks LR also outperformed other models with AUC of 0.715, high specificity (0.930), but low recall (0.500). Overall, 18 weeks predictions resulted in the lowest AUCs, while 6- and 12-week predictions depended on the model.



Fig. 2. AUC values of models predicting A) physical well-being, B) social functioning, C) usual activities, D) mobility deterioration and improvement at 6, 12, and 18 weeks.

3.2 Significance Testing

ANOVA results suggest that at least one model's AUC mean is different from the rest (F=4.202, p=0.007) and Tukey HSD indicated that LR was significantly better than RF (0.011) and XGB (0.041). Outcome also affected prediction performance (F=4.659, p=0.002), as predictions of usual activities had higher mean AUC than role (p=0.0363697) and social (p=0.001) functioning. The time point of prediction was also a factor affecting AUC (F=5.676, p=0.004), with Tukey HSD indicating 18-weeks predictions resulting with significantly higher mean AUC than 6-weeks predictions (p=0.003). Welch Two Sample t-test indicated that improvement predictions were significantly better than deterioration predictions (t=-3.079, df=101.39, p=0.003).

3.3 Feature Importance

Features with coefficients for LR and values of importance for RF are presented in Appendix Tables 6,7,8. For prediction of physical well-being, LR looked mainly at clinical information (comorbidities and cancer characteristics). RF considered Fact-G and EQ-5D as most important predictors, as well as patients' BMI. LR

in predicting mobility also found comorbidities the most meaningful predictors (including EQ5D mobility score at baseline for improvement prediction), while RF mainly looked at PROMs, cancer type and BMI. When predicting usual activities, LR also looked at the clinical characteristics and usual activities baseline score, whilst RF focused on BMI, cancer type and PROMs.

4 Discussion

4.1 Discussion of the Study Findings

Overall results. The findings suggest that ML models applied on PROMs, clinical and demographic data can successfully predict HRQOL outcomes throughout chemotherapy which are meaningful to patients. Models provided excellent performance in predicting improvement in physical well-being, usual activities and mobility at different stages of cancer treatment. Consultation with a clinical oncologist endorsed the view that ML prediction of HRQOL changes during chemotherapy can be useful in clinical practice.

Model performances. LR generally outperformed other models, which is a common outcome in medical research, as other models are more susceptible to overfitting [19]. In some cases, MLP achieved higher performance than LR. Nevertheless, the lack of explainability of MLP could affect public trust in this model. According to the consulted clinical oncologist, even impossible to interpret models should be considered as useful, as long as they are used alongside other well-performing models, which enable explainability.

Change at given time points. Improvement predictions had generally higher performance than deterioration, even though chemotherapy is associated with decline in HRQOL [8]. However, the deterioration might depend on patient characteristics from the start of chemotherapy. For example, metastatic disease may be more likely to show improvement due to higher burden of cancer symptoms prior to treatment. These differences will be further explored.

4.2 Strengths and Limitations

The main strength of this work is the patient-centric approach achieved through the active engagement of a clinical oncologist, consultation with patient representatives and patient reports used as input data. Three time points of HRQOL changes provided another insight into fluctuation of chemotherapy symptoms and when they can affect individuals. Finally, the rigorous reporting of data pre-processing methods, model development and evaluation supports the reproducibility of this study. However, the ethical approval does not allow data sharing, which might negatively impact the reproducibility. Furthermore, this study has limitations typical for data collected in clinical trials. While the ML models have been rigorously designed and evaluated, the data were subject to inclusion and exclusion criteria, which can lead to bias. Temporal clinical trial data are usually relatively small samples and are affected by participants drop outs. This limits the ML methods that have been applied, yet the results are encouraging.

4.3 Conclusions and Future Work

This study successfully applied ML models on PROMs, clinical and demographic data to predict changes in HRQOL during chemotherapy, which could support preparation for adverse effects of chemotherapy and inform treatment decisions. The results further encourage the use of ML methods to identify factors related to chemotherapy toxicity and explore how cancer treatment affects individuals' lives. Patient and clinician involvement ensured that the predicted variables are meaningful for patients and clinically relevant. We are currently extending the stakeholder engagement by designing ways to explain ML models and evaluate possible clinical adoption of the findings from a more representative group of patients. We are also using longitudinally collected PROMs and symptom reports for patient outcome predictions. This will consider traditional ML models and deep learning methods to process multi-dimensional time-series data.

Acknowledgements. The authors thank the patients and clinicians participating in the eRAPID clinical trial for providing the data; Patient Centred Outcomes Research (PCOR) Group in the University of Leeds, Faculty of Medicine and Health, Leeds Institute of Medical Research for consultations of initial study design; and patient representatives of the Use My Data for discussing research relevance. This work was supported in part by UK Research and Innovation (UKRI) [CDT grant number EP/S024336/1].

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A Appendix

Table 2	Romovod	footurog	hagod	on	correlation	opolycic
Table 2.	nemoveu	reatures	Daseu	on	correlation	analysis.

	6 weeks 'SOC0', 'ROL0', 'AgeStudyEntry', 'Sex', 'EWB_overall0'
Physical well-being	12 weeks FWB_overallo', 'SOCO', 'ROLO', 'AgeStudyEntry', 'Sex', 'EWB_overallo', 'CMRheuCTD'
	18 weeks AgeStudyEntry', 'EWB_overallo', 'Sex', 'SOC0'
Social functioning	6 weeks SOC0', 'EWB_overallo', 'AgeStudyEntry', 'ROL0', 'Sex'
	12 weeks SOC0', 'AgeStudyEntry', 'EWB_overallo', 'CMRheuCTD', 'CMCarHyperten', 'FWB_overallo', 'ROL0', 'Sex'
	18 weeks SOC0', 'EWB_overallo', 'AgeStudyEntry', 'Sex'
Role functioning	6 weeks SOC0', 'ROL0', 'Sex', 'AgeStudyEntry', 'FWB_overall0', 'EWB_overall0'
	12 weeks SOC0', 'ROL0', 'Sex', 'CMRheuCTD', 'AgeStudyEntry', 'FWB_overall0', 'EWB_overall0', 'CMCarHyperten'
	18 weeks SOC0', 'Sex', 'AgeStudyEntry', 'EWB_overallo', 'CMCarHyperten'
	6 weeks ROL0', 'EWB_overall0', 'FWB_overall0', 'Sex', 'AgeStudyEntry', 'SOC0'
Usual activities	12 weeks 'ROL0', 'EWB_overall0', 'CMCarHyperten', 'FWB_overall0', 'CMRheuCTD', 'Sex', 'AgeStudyEntry', 'SOC0'
	18 weeks EWB_overallo', 'FWB_overallo', 'Sex', 'AgeStudyEntry', 'SOC0'
	6 weeks 'AgeStudyEntry', 'PWB_overall0', 'SOC0', 'ROL0', 'Sex', 'FWB_overall0', 'EWB_overall0'
Mobility	12 weeks 'AgeStudyEntry', 'ROL0', 'SOC0', 'Sex', 'CMCarHyperten', 'FWB_overallo', 'CMRheuCTD', 'EWB_overallo'
	18 weeks 'AgeStudyEntry', 'SOC0', 'ROL0', 'Sex', 'EWB_overall0'

Physical well-being	g	Social functioning	5	Role functioning		Usual activities		Mobility	
StudyArm	0	StudyArm	0	StudyArm	0	StudyArm	0	StudyArm	0
DiseaseSite	0	DiseaseSite	0	DiseaseSite	0	DiseaseSite	0	DiseaseSite	0
Sex	0	Sex	0	Sex	0	Sex	0	Sex	0
PreviousChemo	0	PreviousChemo	0	PreviousChemo	0	PreviousChemo	0	PreviousChemo	0
AgeStudyEntry	0	AgeStudyEntry	0	AgeStudyEntry	0	AgeStudyEntry	0	AgeStudyEntry	0
PrimaryorMet	0	PrimaryorMet	0	PrimaryorMet	0	PrimaryorMet	0	PrimaryorMet	0
BCBMI	1	BCBMI	1	BCBMI	1	BCBMI	1	BCBMI	2
Comorbidities	0	Comorbidities	0	Comorbidities	0	Comorbidities	0	Comorbidities	0
CMCarMI	0	CMCarMI	0	CMCarMI	0	CMCarMI	0	CMCarMI	0
CMCarAngina	0	CMCarAngina	0	CMCarAngina	0	CMCarAngina	0	CMCarAngina	0
CMCarHeartFail	0	CMCarHeartFail	0	CMCarHeartFail	0	CMCarHeartFail	0	CMCarHeartFail	0
CMCarArrhythm	0	CMCarArrhythm	0	CMCarArrhythm	0	CMCarArrhythm	0	CMCarArrhythm	0
CMCarHyperten	0	CMCarHyperten	0	CMCarHyperten	0	CMCarHyperten	0	CMCarHyperten	0
CMCarVenous	0	CMCarVenous	0	CMCarVenous	0	CMCarVenous	0	CMCarVenous	0
CMBesCOPD	0	CMBesCOPD	0	CMBerCOPD	0	CMBerCOPD	0	CMBesCOPD	0
CMResEmphys	0	CMResEmphys	0	CMResEmphys	0	CMResEmphys	0	CMResEmphys	0
CMRosAsthma	0	CMRosAsthma	0	CMRosAsthma	0	CMRosAsthma	0	CMRosAsthma	0
CMRosChronBron	0	CMRosChronBron	0	CMRosChronBron	0	CMRosChronBron	0	CMRosChronBron	0
CMCssChronHon	0	CMCarCharallan	0	CMCarCharallan	0	CMCssChronHen	0	CMCssChronHen	0
CMGasChronnep	0	CMGasChronnep	0	CMGasChronnep	0	CMGasChronnep	0	CMGasChronnep	0
CMGasCirriosis	0	CMGasCirriosis	0	CMGasCirriosis	0	CMGasCirriosis	0	CMGasCirriosis	0
CMGasPancreas	0	CMGasPancreas	0	CMGasPancreas	0	CMGasPancreas	0	CMGasPancreas	0
CMStomUlcers	0	CMStomUlcers	0	CMStomUlcers	0	CMStomUlcers	0	CMStomUlcers	0
CMStomMalabsor	0	CMStomMalabsor	0	CMStomMalabsor	0	CMStomMalabsor	0	CMStomMalabsor	0
CMStomInflamm	0	CMStomInflamm	0	CMStomInflamm	0	CMStomInflamm	0	CMStomInflamm	0
CMEndDiabetes	0	CMEndDiabetes	0	CMEndDiabetes	0	CMEndDiabetes	0	CMEndDiabetes	0
CMEndHypothy	0	CMEndHypothy	0	CMEndHypothy	0	CMEndHypothy	0	CMEndHypothy	0
CMEndHyperth	0	CMEndHyperth	0	CMEndHyperth	0	CMEndHyperth	0	CMEndHyperth	0
CMRenEndStage	0	CMRenEndStage	0	CMRenEndStage	0	CMRenEndStage	0	CMRenEndStage	0
CMNeuStroke	0	CMNeuStroke	0	CMNeuStroke	0	CMNeuStroke	0	CMNeuStroke	0
CMNeuMS	0	CMNeuMS	0	CMNeuMS	0	CMNeuMS	0	CMNeuMS	0
CMNeuParkins	0	CMNeuParkins	0	CMNeuParkins	0	CMNeuParkins	0	CMNeuParkins	0
CMNeuMyasth	0	CMNeuMyasth	0	CMNeuMyasth	0	CMNeuMyasth	0	CMNeuMyasth	0
CMRheuArth	0	CMRheuArth	0	CMRheuArth	0	CMRheuArth	0	CMRheuArth	0
CMRheuLupus	0	CMRheuLupus	0	CMRheuLupus	0	CMRheuLupus	0	CMRheuLupus	0
CMRheuCTD	0	CMRheuCTD	0	CMRheuCTD	0	CMRheuCTD	0	CMRheuCTD	0
CMRheuPolymyo	0	CMRheuPolymyo	0	CMRheuPolymyo	0	CMRheuPolymyo	0	CMRheuPolymyo	0
CMRheuRhPolymy	0	CMRheuRhPolymy	0	CMRheuRhPolymy	0	CMRheuRhPolymy	0	CMRheuRhPolymy	0
CMPrevMal	0	CMPrevMal	0	CMPrevMal	0	CMPrevMal	0	CMPrevMal	0
CMSubstAlcohol	0	CMSubstAlcohol	0	CMSubstAlcohol	0	CMSubstAlcohol	0	CMSubstAlcohol	0
CMSubstDrugs	0	CMSubstDrugs	0	CMSubstDrugs	0	CMSubstDrugs	0	CMSubstDrugs	0
DCMarital	4	DCMarital	4	DCMarital	4	DCMarital	4	DCMarital	4
DCEmployment	12	DCEmployment	12	DCEmployment	12	DCEmployment	12	DCEmployment	12
ed lev	12	ed lev	12	ed lev	12	ed lev	12	ed lev	12
EQ5DMob0	4	EQ5DMob0	4	EQ5DMob0	4	EQ5DMob0	3	EQ5DMob0	2
EQ5DSelCar0	3	EQ5DSelCar0	3	EQ5DSelCar0	3	EQ5DSelCar0	2	EQ5DMob18	0
EQ5DUsuAct0	3	EQ5DUsuAct0	3	EQ5DUsuAct0	3	EQ5DUsuAct0	2	EQ5DSelCar0	2
EO5DPain0	5	EO5DPain0	5	EO5DPain0	5	EQ5DUsuAct18	0	EQ5DUenAct0	2
EQ5DAnyDep0	5	EQ5DAnyDep0	5	EQ5DAnyDep0	5	EQ5DPoin0	4	EO5DPain0	1
FOSDVAS0	4	FOSDVAS0	4	FOSDWAS0	4	FO5DAnyDop0	4	FO5DAnyDop0	1
BOLO	4 9	POL0	4 9	BOLO	4	FOSDVAS0	3	FOSDWAS0	3
ROLO	2	ROLO	4	ROLU DOI 19	4	EQ3DVA30 DOLO	0 0	EQ3DVA30	0
DWD overello	4	5000	4	ROLIS SOCO	0	SOCO	2	ROLU SOCO	3
DWD overall	0	DWD	0	5000 DWD	4	DWD	4	5000 DWD	0
FWB_overall18	0	PWB_overall0	8	FWB_overall0	8	PWB_overall0	8	FWB_overall0	9
SWD_OVERAIIU	4	EWD UC	4	SWD_overall0	4	SWD_OVERAIIU	4	SWD_overall0	0
EWB_overall0	1	EWB_overall0	1	EWB_overall0	1	EWB_overall0	1	EWB_overall0	2
r WB_overall0	1	FWB_overall0	1	rwB_overall0	1	r wB_overall0	1	rwB_overall0	2

 Table 3. Number of missing data in each variable for each outcome at 18 weeks.

D i							
Data	Outcome et	Model	1	SpeelBelty	Recoll	AUC	Deterioration Use an anomalo materia
Outcome	outcome at	TD	Accuracy 0.710	o eze	n cecali	AUC 0.710	nyperparameters
		LR	0.716	0.676	0.745	0.710	C': 10, max iter: 10000, penalty: 12, solver: liblinear mitorion/ Mari June, double 18, bain, complex all 2, 'n estimatory', 500
	6 weeks	YCB	0.636	0.459	0.765	0.612	Criction and the action of the
		MLP	0.591	0.162	0.902	0.532	activation': 'tanh', 'alpha': 1e.05, 'early, stonping': True, 'hidden, laver, sizes': (100, 50, 20), 'max, iter': 10000, 'solver', 'adam'
		LR	0.663	0.656	0.667	0.661	C: 10. 'max_iter': 10000. 'penalty': '12. 'solver: 'liblinear'
	40.1	RF	0.613	0.438	0.729	0.583	criterion': 'entropy', 'max depth': 18, 'min samples split': 2, 'n estimators': 500
Physical well-being	12 weeks	XGB	0.625	0.469	0.729	0.599	learning rate': 1.0, 'loss': 'log loss', 'n estimators': 100
		MLP	0.638	0.656	0.625	0.641	activation': 'relu', 'alpha': 0.01, 'early_stopping': True, 'hidden_layer_sizes': (150, 60, 30), 'max_iter': 10000, 'solver': 'adam'
		LR	0.766	0.727	0.795	0.761	C': 1, 'max_iter': 10000, 'penalty': 'l2', 'solver': 'liblinear'
	18 weeks	RF	0.675	0.424	0.864	0.644	criterion': 'entropy', 'max_depth': 14, 'min_samples_split': 2, 'n_estimators': 100
		XGB	0.662	0.545	0.750	0.648	learning_rate': 0.1, 'loss': 'exponential', 'n_estimators': 500
	-	MLP	0.740	0.667	0.795	0.731	activation: relu, 'alpha: 0.001, 'early_stopping: True, 'hidden_layer_sizes': (150, 60, 30), 'max_iter': 10000, 'solver': 'adam'
Outcome	Outcome at	Model	Accuracy	Specificity	Recall	AUC	Hyperparameters
		LR	0.557	0.608	0.486	0.547	C: 1, max iter: 10000, penalty: 12, solver: hblmear
	6 weeks	VCD	0.602	0.784	0.331	0.568	criterion: entropy, max depta: 14, mm samples split 2, n estimators: 500
		MLP	0.591	0.765	0.331	0.555	icaring_rate 1.0, 1088 - 10g_1088 , n_estimators . 000
		LB	0.561	0.600	0.524	0.562	activation and a second s
		BF	0.501	0.375	0.643	0.509	Criterion', 'entrony' 'max denth', 12, savet, nage
Social functioning	12 weeks	XGB	0.463	0.425	0.500	0.463	learning rate': 0.1, 'loss': 'log loss', 'n estimators': 500
		MLP	0.512	0.000	1.000	0.500	activation': 'relu', 'alpha': 0.001, 'early stopping': True, 'hidden layer sizes': (100, 50, 20), 'max iter': 10000, 'solver': 'adam'
		LR	0.692	0.786	0.583	0.685	C': 0.1, 'max iter': 10000, 'penalty': '12', 'solver': 'liblinear'
	18 mooleo	RF	0.628	0.810	0.417	0.613	criterion': 'entropy', 'max_depth': 18, 'min_samples_split': 2, 'n_estimators': 500
	10 WCCAS	XGB	0.564	0.738	0.361	0.550	learning_rate': 0.1, 'loss': 'log_loss', 'n_estimators': 500
		MLP	0.436	0.381	0.500	0.440	activation': 'tanh', 'alpha': 1e-05, 'early_stopping': True, 'hidden_layer_sizes': (100, 50, 20), 'max_iter': 10000, 'solver': 'sgd'
Outcome	Outcome at	Model	Accuracy	Specificity	Recall	AUC	Hyperparameters
		LR	0.568	0.540	0.605	0.573	C': 0.1, 'max_iter': 10000, 'penalty': '12', 'solver': 'newton-cg'
	6 weeks	RF	0.580	0.820	0.263	0.542	criterion': 'entropy', 'max_depth': 18, 'min_samples_split': 2, 'n_estimators': 100
		MID	0.391	0.780	1.000	0.501	icarning_rate:1.0, loss: log_loss; n_estimators: 500 astimation; bable; bable; loss: 0.0, loss; n_estimators: 500
H		TP	0.432	0.600	0.750	0.300	activation : refut, apita : 1e-05, early stopping : True, indue _ layer_sizes : (100, 50, 20), max_iter : 10000, solver : sgu
	12 weeks	BF	0.646	0.646	0.841	0.631	C. C. 1, mix and a coordinate of the second state of the second st
Role functioning		XGB	0.573	0.395	0.727	0.561	learning rate: 1.0 'loss' 'log loss' 'n estimators' 500
		MLP	0.524	0.395	0.636	0.516	activation': 'relu', 'alpha': 0.01, 'early stopping': True, 'hidden layer sizes': (100, 50, 20), 'max iter': 10000, 'solver': 'adam'
		LR	0.675	0.674	0.676	0.675	C': 0.1, 'max iter': 10000, 'penalty': '12', 'solver': 'newton-cg'
	18 mooleo	RF	0.675	0.837	0.471	0.654	criterion': 'gini', 'max_depth': 14, 'min_samples_split': 2, 'n_estimators': 500
	10 weeks	XCB	0.636	0.721	0.529	0.625	learning rate': 1.0. 'loss': 'exponential'. 'n estimators': 100
		AGID	01000				
		MLP	0.662	0.628	0.706	0.667	activation': 'tanh', 'alpha': 0.01, 'early_stopping': True, 'hidden_layer_sizes': (100,), 'max_iter': 10000, 'solver': 'adam'
Outcome	Outcome at	MLP Model	0.662 Accuracy	0.628 Specificity	0.706 Recall	0.667 AUC	activation': 'tanh', 'alpha': 0.01, 'early_stopping': True, 'hidden_layer_sizes': (100,), 'max_iter': 10000, 'solver': 'adam' Hyperparameters
Outcome	Outcome at	MLP Model LR	0.662 Accuracy 0.693	0.628 Specificity 0.759	0.706 Recall 0.567	0.667 AUC 0.663	activation': 'tanh', 'alpha': 0.01, 'early_stopping': Tree, 'hidden_layer_sizes': (100.), 'max_lter': 10000, 'solver': 'adam' Hyperparameters C': 1, 'max_iter': 10000, 'penalty': '12', 'solver': 'newton-cg
Outcome	Outcome at 6 weeks	MLP Model LR RF	0.662 Accuracy 0.693 0.705	0.628 Specificity 0.759 0.948	0.706 Recall 0.567 0.233	0.667 AUC 0.663 0.591	activation'' tank' alpha' 601, 'enty stopping' True, libden layer sizes' (100), 'max iter' 10000, 'solver'; 'adam' Hyperparameters C': 1, 'max iter'; 10000, 'penalty': 12', 'solver'; 'newton-cg' criterion'' ginl', 'max depti?: 18, 'max angles qu'iz', 'g, 'estimators': 100
Outcome	Outcome at 6 weeks	MLP Model LR RF XGB	0.662 Accuracy 0.693 0.705 0.670	0.628 Specificity 0.759 0.948 0.828 0.828	0.706 Recall 0.567 0.233 0.367	0.667 AUC 0.663 0.591 0.597	activation': 'tanh', 'alpha': 0.01, 'early stopping': True, 'hidden layer sizes': (100.), 'max_tter': 10000, 'solver': 'adam' C': 1, 'max_tter': 10000, 'pomuly': '12, 'solver': 'newton-og criterion'; ginl' imax_depth: 18, 'min_samples split: 2, 'n_estimators': 100 Journing rate': 1.0, 'loss': log loss', 'n estimators': 000
Outcome	Outcome at 6 weeks	MLP Model LR RF XGB MLP	0.662 Accuracy 0.693 0.705 0.670 0.659	0.628 Specificity 0.759 0.948 0.828 0.931 0.782	0.706 Recall 0.567 0.233 0.367 0.133	0.667 AUC 0.663 0.591 0.597 0.532	activation's tanh' alpha's 60.1, 'enty stopping' True, hidden layer sizes' (100.), 'max_iter', 10000, 'solver', 'adam' Hyperparameters G'.1, 'max_iter', 10000, 'penalty', 12', 'solver', 'newton-cg' crietrion'' [301', 'max_depk'), 18, 'max_anplos_split', 2, 'n estimators', 100 learning rate', 1.0, 'loss' log, loss', 'n estimators', 500 environis', 'man', 'alpha': 16:0, 'rayer', stopping' True, hidden_layer_sizes', (150, 60, 30), 'max_iter', 10000, 'solver', 'adam'
Outcome	Outcome at 6 weeks	MLP Model LR RF XGB MLP LR RF	0.662 Accuracy 0.693 0.705 0.670 0.659 0.744 0.707	0.628 / Specificity 0.759 0.948 0.828 0.931 0.783 0.891	0.706 Recall 0.567 0.233 0.367 0.133 0.694 0.472	0.667 AUC 0.663 0.591 0.597 0.532 0.739 0.682	activation': 'tanh', 'alpha': 0.01, 'early _stopping': True, 'hidden _layer_sizes': (100.), 'max_iter': 10000, 'solver': 'adam' C': 1, 'max_iter': 10000, 'pomply': 12, 'solver': 'newtonerg' crimeno': 'ada', 'max_iter': 10000, 'pomply': 'newtonerg' crimeno': 'ada', 'max_iter': 10000, 'pomply': 'newtonerg' crimeno': 'ada', 'max_iter': 10000, 'pomply': 'adapting': True, 'hiddenlayer_sizes': (150, 60, 30), 'max_iter': 10000, 'solver': 'adam' C': 1, 'max_iter': 10000, 'pomply': 'adapting': True, 'hiddenlayer_sizes': (150, 60, 30), 'max_iter': 10000, 'solver': 'adam' C': 1, 'max_iter': 10000, 'pomply': 'adapting': 'adapting': 'a newtonerg': 'max_iter': 'noon, 'solver': 'adam'
Outcome Usual activities	Outcome at 6 weeks 12 weeks	MLP Model LR RF XGB MLP LR RF XGB	0.662 Accuracy 0.693 0.705 0.670 0.659 0.744 0.707 0.671	0.628 (Specificity 0.759 0.948 0.828 0.931 0.783 0.891 0.826	0.706 Recall 0.567 0.233 0.367 0.133 0.694 0.472 0.472	0.667 AUC 0.591 0.597 0.532 0.739 0.682 0.649	activation': tanh', alpha': 60.1, 'early stopping', True, 'hidden layer sizes'; (100), 'max_tter'; 10000, 'wolver'; 'hadam' Hyperparameters C': 1, 'max_tter'; 10000, 'penalty'; 12', 'solver'; 'howton-cg' crietton'; 'gin'; 'max_depk'; 18, 'max_stopping'; 'Tue, 'hidden layer sizes'; (160, 60, 30), 'max_tter'; 10000, 'solver'; 'adam' C': 1, 'max_tter'; 10000, 'penalty'; '12', 'solver'; 'libinost'; '100 C': 1, 'max_tter'; 10000, 'max_tter'; 'libinost'; '000 C': 1, 'max_tter'; 'libinost'; '100 C': 1, 'max_tter'; '100 C': 1, 'max_tter; '100 C': 1,
Outcome Usual activities	Outcome at 6 weeks 12 weeks	MLP Model LR RF XGB MLP LR RF XGB MLP	0.662 Accuracy 0.693 0.705 0.670 0.659 0.744 0.707 0.671 0.683	0.628 (Specificity 0.759 0.948 0.828 0.931 0.783 0.891 0.826 0.717	0.706 Recall 0.567 0.233 0.367 0.133 0.694 0.472 0.472 0.472 0.472	0.667 AUC 0.663 0.591 0.597 0.532 0.739 0.682 0.649 0.678	activation": "tanh", "alpha": 0.01, "carly _stopping": True, 'hidden layer_stores"; (100.), "max_iter"; 10000, "solver"; 'adam" (C': 1, "max_iter"; 10000, "penalty"; 12, 'solver"; 'newtonerg' criterion"; 'ani', "max_cdept1: 18, "max_angles, split; 2, 'n estimators': 100 [barning rate": 1.0, "toos"; "log lose", 'n estimators': 500 criterion"; 'ani', "alpha": teoly. "caractery stopping"; "mae, 'hidden layer_sizes"; (150, 60, 30), 'max_iter"; 10000, 'solver'; 'adam" (C': 1, "max_iter"; 10000, 'penalty'; '12, 'solver'; 'liblinas' (C': 1, "max_iter"; 10000, 'penanty'; '12, 'solver'; 'liblinas' criterion"; carloy, "max_tept1: 11, "min_samples, split; 2, 'n estimators'; 100 [barning rate'; 0.1, "oss'; 'exponential', 'n estimators'; S00 [barning rate'; 0.1, "loss'; 'exponential', 'n estimators'; S00
Outcome Usual activities	Outcome at 6 weeks 12 weeks	MLP Model LR RF XGB MLP LR RF XGB MLP LR	0.662 Accuracy 0.693 0.705 0.670 0.659 0.744 0.707 0.671 0.683 0.688	0.628 (Specificity 0.759 0.948 0.828 0.931 0.783 0.891 0.826 0.717 0.675	0.706 Recall 0.567 0.233 0.367 0.133 0.694 0.472 0.472 0.472 0.639 0.703	0.667 AUC 0.663 0.591 0.597 0.532 0.682 0.649 0.678 0.689	activation': tanh' alpha' coll, 'early stopping' True, 'hidden layer sizes' (100), 'max_tter': 10000, 'wolver': 'hadam' Hyperparameters C': 1, 'max_tter': 10000, 'penalty': 12', 'wolver': 'howton-cg' crierion': 'gain', 'max_deph': 18, 'max_stopping': True, 'hidden layer sizes' (100, 60, 30), 'max_tter': 10000, 'solver': 'adam' C': 1, 'max_tter': 10000, 'penalty': 12', 'wolver': 'hidden' layer sizes' (100, 60, 30), 'max_tter': 10000, 'solver': 'adam' C': 1, 'max_tter': 10000, 'penalty': 12', 'wolver': 'hidden' signer sizes' (100, 60, 30), 'max_tter': 10000, 'solver': 'adam' C': 1, 'max_tter': 10000, 'penalty': 12', 'wolver': 'hidden' signer sizes' (100, 0), 'max_tter': 10000, 'solver': 'adam' c': 1, 'max_tter': 'uolon, 'penalty': 12', 'wolver': 'hidden' signer sizes' (100, 0), 'max_tter': 10000, 'solver': 'adam' c': 1, 'max_tter': 'uolon, 'penalty': 12', 'wolver': 'hidden layer sizes' (100, 0), 'max_tter': 10000, 'solver': 'adam'
Outcome Usual activities	Outcome at 6 weeks 12 weeks	MLP Model LR RF XGB MLP LR RF XGB MLP LR RF	0.662 Accuracy 0.693 0.705 0.670 0.659 0.744 0.707 0.671 0.683 0.688 0.649	0.628 (Specificity 0.759 0.948 0.828 0.931 0.783 0.891 0.826 0.717 0.675 0.750	0.706 Recall 0.567 0.233 0.367 0.133 0.694 0.472 0.472 0.472 0.639 0.703 0.541	0.667 AUC 0.663 0.591 0.597 0.532 0.682 0.649 0.678 0.689 0.645	activation': 'tanh', 'alpha': 0.01, 'early _stopping': True, 'hidden layer_sizes': (100.), 'max_iter': 10000, 'solver': 'adam' C': 1, 'max_iter': 10000, 'penalty': 12, 'solver': 'newton-cg' circiterion': 'gin': 'max_cdept': 18, 'max_sidpes, split: 2, 'n estimator': 100 Jeaning rate': 1.0, 'nos': 'log Jose', 'n estimator': 500 activation': 'tanh', 'alpha': 1-60, 'rang' stopping': True, 'hidden layer_sizes': (150, 60, 30), 'max_iter': 10000, 'solver': 'adam' C': 1, 'max_iter': 10000, 'penalty': 12, 'solvert': 'Bilinear' circiterion': circitery', 'max_cdept': 14, 'min_sample_split: 2, 'n estimator': 100 Jeaning rate': 0.1, 'nos': 'exponential', 'n estimator': 500 activation': 'enth', 'lapha': 1-60, 'soret', stopping: 'True, hidden_layer_sizes': (100,), 'max_iter': 10000, 'solver': 'adam' C': 1, 'max_iter': 10000, 'penalty': 12, 'solvert': hodden_layer_sizes': (100,), 'max_iter': 10000, 'solver': 'adam' C': 1, 'max_iter': 10000, 'mangly: '12, 'solvert': hodden_layer_sizes': (100,), 'max_iter': 10000, 'solver': 'adam'
Outcome Usual activities	Outcome at 6 weeks 12 weeks 18 weeks	MLP Model LR RF XGB MLP LR RF XGB MLP LR RF XGB	0.662 Accuracy 0.693 0.705 0.670 0.659 0.744 0.707 0.671 0.683 0.688 0.649 0.688	0.628 / Specificity 0.759 0.948 0.828 0.931 0.783 0.891 0.826 0.717 0.675 0.750 0.800	0.706 Recall 0.567 0.233 0.367 0.133 0.694 0.472 0.472 0.639 0.703 0.541 0.568	0.667 AUC 0.663 0.591 0.597 0.532 0.682 0.649 0.678 0.689 0.645 0.684	activation': tanh' alpha' coll, 'early stopping' True, 'hidden layer sizes' (100), 'max_tter': 10000, 'wolver': 'hadam' Hyperparameters C': 1, 'max_tter': 10000, 'penalty': 12', 'wolver': 'howton-cg' criterion': 'gain', 'max_deph': 18, 'max_stopping': True, 'hidden layer sizes' (100, 60, 30), 'max_tter': 10000, 'solver': 'adam' C': 1, 'max_tter': 10000, 'penalty': 12', 'wolver': 'hidden layer sizes' (100, 60, 30), 'max_tter': 10000, 'solver': 'adam' C': 1, 'max_tter': 10000, 'penalty': 12', 'wolver': 'hidden layer sizes' (100, 60, 30), 'max_tter': 10000, 'solver': 'adam' C': 1, 'max_tter': 10000, 'penalty': 12', 'wolver': 'hidden layer sizes' (100, 0), 'max_tter': 10000, 'solver': 'adam' C': 1, 'max_tter': 10000, 'penalty': 12', 'wolver': 'hidden layer sizes' (100, 0), 'max_tter': 10000, 'solver': 'adam' C': 1, 'max_tter': 10000, 'penalty': 12', 'wolver': 'hidden layer sizes' (100, 0), 'max_tter': 10000, 'solver': 'adam' C': 1, 'max_tter': 10000, 'penalty': 12', 'wolver': 'hidden layer sizes' (100, 100, 'max_tter': 'adam' criterion''; 'fan', 'max_tdeph': 14, 'min_samples split', 2, 'n cettmator: 500
Outcome Usual activities	Outcome at 6 weeks 12 weeks 18 weeks	MLP Model LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP	0.662 Accuracy 0.693 0.705 0.670 0.659 0.744 0.707 0.6671 0.683 0.688 0.649 0.688 0.649	0.628 / Specificity 0.759 0.948 0.828 0.931 0.783 0.891 0.826 0.717 0.675 0.750 0.800 0.625	0.706 Recall 0.567 0.233 0.367 0.133 0.694 0.472 0.472 0.472 0.472 0.639 0.703 0.541 0.568 0.811	0.667 AUC 0.663 0.591 0.597 0.532 0.682 0.649 0.678 0.689 0.6689 0.6689 0.6689 0.6684 0.6684 0.591	activation": "tanh", "alpha": 0.01, "early stopping"; True, 'hidden layer, sizes"; (100.), "max_iter"; 10000, "solver"; 'adam" C': 1, "max_iter"; 10000, "penalty"; 12, "solver"; 'newton-cg' criterion"; 'gini', 'max_ deph2': 18, "manipus split; 2, 'n estimators"; 100 learning rate"; 1.0, "loss"; 'log loss", 'n estimators'; 500 activation; 'tanh', 'alpha": 1-60, "carrier"; 'lobinear' criterion"; 'gini', 'max_iter; '10000, "penalty'; 12," alpha"; 'lobinear'; 100 learning rate; '0.1, "loss, 'log cost, 'n estimators'; 500 activation; 'tanh', 'lapha': 1-60, "carrier"; 'lobinear' criterion"; 'carloy"; 'max_deph2: 14, "in maxample split; 2, 'n estimators; 100 learning rate; '0.1, "loss,' 'coponential,", 'n estimators; 500 activation; 'tanh', 'lapha': 1-60, "carrier"; 'newton-cg' criterion"; 'ginity, "lapha': 1-60, "carrier"; 'newton-cg' criterion"; 'ginity, 'lapha': 1-60, "carrier"; 'newton-cg' criterion; 'ginity, 'lapha': 1-60, "carrier"; 'newton-cg' criterion; 'ginity, 'lapha': 1-60, "carrier"; 'newton-
Outcome Usual activities Outcome	Outcome at 6 weeks 12 weeks 18 weeks Outcome at	MLP MLP Model LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP MOdel	0.662 Accuracy 0.693 0.705 0.670 0.659 0.744 0.707 0.671 0.683 0.688 0.649 0.688 0.714 Accuracy	0.628 (Specificity 0.759 0.948 0.828 0.931 0.826 0.717 0.675 0.750 0.800 0.625 (Specificity	0.706 Recall 0.567 0.233 0.367 0.133 0.694 0.472 0.472 0.639 0.703 0.541 0.568 0.811 Recall	0.667 AUC 0.663 0.591 0.597 0.532 0.682 0.649 0.668 0.6689 0.645 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.6	activation': 'tanh', 'alpha': 601, 'early stopping': True, 'hidden layer sizes': (100), 'max_tter': 10000, 'wolver': 'adam' Hyperparameters G': 1, 'max_tter': 10000, 'penally': 12, 'wolver': 'howton-reg' criterion': 'gain', 'max_deph': 18, 'max_stopping': True, 'hidden layer sizes': (100, 60, 30), 'max_tter': 10000, 'solver': 'adam' G': 1, 'max_tter': 10000, 'penally': 12, 'wolver': 'bilinear' G': 1, 'max_tter': 10000, 'penally': 12, 'wolver': 'bilinear' G': 1, 'max_tter': 10000, 'penally': 12, 'wolver': 'bilinear' C': 1, 'max_tter': 10000, 'penally': 12, 'wolver': 'bilinear' G': 1, 'max_tter': 10000, 'penally': 12, 'wolver': 'bilinear' C': 1, 'max_tter': 10000, 'penally': 14, 'min_samples split' 2, 'wolver': 'bilinear': 5000 activation': 'tanh', 'alpha': 0.01, 'early' stopping': 'True, 'hidden layer_sizes': (100, 00, 'max_tter': 10000, 'wolver': 'adam' Hyperparameters
Outcome Usual activities Outcome	Outcome at 6 weeks 12 weeks 18 weeks Outcome at	MLP MLP Model LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP	0.662 Accuracy 0.693 0.705 0.670 0.659 0.744 0.707 0.671 0.688 0.649 0.688 0.714 Accuracy 0.545	0.628 / Specificity 0.759 0.948 0.828 0.931 0.783 0.891 0.826 0.717 0.675 0.750 0.800 0.625 / Specificity 0.560	0.706 Recall 0.567 0.233 0.367 0.133 0.694 0.472 0.472 0.472 0.639 0.703 0.541 0.568 0.811 Recall 0.462	0.667 AUC 0.663 0.591 0.597 0.532 0.682 0.649 0.668 0.6689 0.645 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6684 0.6584 0.6584 0.6584 0.6584 0.6584 0.6584 0.6584 0.6584 0.6584 0.6584 0.6584 0.6584 0.6584 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.5511 0.55111 0.55111 0.55111	activation'' tanh', alpha': 0.01, 'arry stopping': True, 'hidden layer sizes'; (100,), 'max iter'; 10000, 'solver'; 'adam' Hyperparameters C': 1, 'max iter'; 10000, 'penalty'; 12', 'aolver'; 'bavton-reg' criterion'' gain', 'max deply'; 18, 'max in anglas qaib'; 2, 'n estimatory'; 100 lawning rate'; 10, has,' kag lose', 'n estimatory; 500 Losening rate'; 10, has,' kag, 'lose', 'n estimatory; 500 C': 1, 'max iter'; 10000, 'penalty'; 2, 'aolver'; 'bilimeat/ent layer sizes'; (110, 60, 30), 'max iter'; 10000, 'solver'; 'adam' C': 1, 'max iter'; 10000, 'penalty'; 2, 'aolver'; 'bilimeat/ent criterion'; 'entropy', 'max deply); 14, 'min samples split'; 2, 'n estimatory; 100 activation'; 'redi,' alpha'; 16.65, 'aerly stopping'; 'True, 'hidden layer sizes'; (100, 'max iter'; 10000, 'solver'; 'adam' C': 1, 'max iter'; 10000, 'penalty'; 'z, 'solver'; 'bilitane'; 500 activation'; 'redi,' alpha'; 16.65, 'aerly stopping'; 'True, 'hidden layer sizes'; (100, 'max iter'; 10000, 'solver'; 'adam' C': 1, 'max iter'; 10000, 'penalty'; 'z, 'solver'; 'bilitane'; 500 'activation'; redi,', 'lapha'; 10.1, 'aerly'; 'apprential'; 'n, 'hidden layer sizes'; (100, 50, 20), 'max iter'; 10000, 'solver'; 'adam' Hyperparameters C': 100, 'mag iter'; 10000, 'penalty'; 'z', 'solver'; 'bilitane'
Outcome Usual activities Outcome	Outcome at 6 weeks 12 weeks 18 weeks Outcome at 6 weeks	MLP MLP Model LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP	0.662 Accuracy 0.693 0.705 0.670 0.659 0.744 0.707 0.671 0.683 0.648 0.648 0.648 0.648 0.648 0.714 Accuracy 0.545 0.535	0.628 (Specificity 0.759 0.948 0.828 0.828 0.891 0.8891 0.826 0.717 0.675 0.750 0.800 0.625 (Specificity 0.560 0.973	0.706 Recall 0.567 0.233 0.367 0.133 0.694 0.472 0.472 0.472 0.472 0.639 0.703 0.541 0.568 0.811 Recall 0.462 0.000	0.667 AUC 0.663 0.591 0.597 0.532 0.739 0.682 0.649 0.6689 0.645 0.689 0.645 0.684 0.718 AUC 0.511 0.487	activation? 'tanh', 'alpha': 600, 'tenty stopping', True, 'hidden layer sizes' (100), 'max_iter': 10000, 'bohver'; 'adam' Hyperparameters C': 1, 'max_iter': 10000, 'penalty'; 12, 'abver': 'howton-reg' criterion'; 'gini', 'max_depth'; 18, 'max_anplos_phi'; 2, 'n_s estimators': 100 Bearning rate': 10, 'new': 'hog low', 'n_s estimators': 600 estivation'; 'tanh', 'hagha': 1605, 'rest', 'abbreat'; 'bbhinast' C': 1, 'max_iter': 10000, 'penalty'; 12, 'abver': 'bbhinast' criterion'; 'fanh', 'max_depth'; 14, 'min_samples_phi'; 2, 'n_settimators': 500 activation'; 'tanh', 'alpha': 0.01, 'entry stopping', 'True, 'hidden layer_sizes' (100,0, 'max_iter': 10000, 'bohver'; 'adam' C': 100, 'max_iter'; 10000, 'penalty'; 12, 'bohver', 'bevernest' 'Berning rate': 10, 'bos' 'copenantif', 'n_settimator': 500 activation'; 'tanh', 'alpha': 0.01, 'entry stopping', 'True, 'hidden layer_sizes' (100, 0,)max_iter': 10000, 'bohver'; 'adam' C': 100, 'max_iter'; 10000, 'penalty'; 12, 'bos''; 'bbernest' 'enterion'; 'fanh', 'max_depth'; 18, 'min_sample_pth'; 2, 'n_settimators'; 100
Outcome Usual activities Outcome	Outcome at 6 weeks 12 weeks 18 weeks Outcome at 6 weeks	MLP MLP Model LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB	0.662 Accuracy 0.693 0.705 0.670 0.659 0.744 0.707 0.671 0.688 0.649 0.649 0.744 Accuracy 0.545 0.838 0.714	0.628 (Specificity 0.759 0.948 0.828 0.828 0.783 0.891 0.826 0.717 0.675 0.675 0.750 0.800 0.6625 (Specificity 0.560 0.973 0.827	0.706 Recall 0.567 0.233 0.367 0.133 0.694 0.472 0.472 0.639 0.703 0.541 0.568 0.811 Recall 0.462 0.000 0.077	0.667 AUC 0.663 0.591 0.597 0.532 0.739 0.682 0.649 0.678 0.684 0.684 0.684 0.684 0.684 0.684 0.684 0.591 0.645 0.684 0.591 0.487 0.452 0.452	sciwation's tank', alpha': 601, 'early stopping'. True, liabden layer sizes' (100), 'max iter'; 10000, 'solver'; 'adam' Hyperparameters G': 1, 'max iter', 10000, 'penalty'; 12', 'advert', 'hewton-cg' criterion' 'ginl', 'max depth'; 18, 'min samples split'; 2, 'n estimator'; 100 lowning rate'; 11, 'kee', 'kee', 'advert', 'Billmeart' C': 1, 'max iter', '10000, 'penalty'; '2, 'advert', 'Billmeart' C': 1, 'max iter', '10000, 'penalty'; '2, 'advert', 'Billmeart' C': 1, 'max iter', '10000, 'max'; '2, 'advert', 'Billmeart' criterion'; 'adam', 'nes', 'coposetti, 'n estimator'; 500 stativation', 'real', 'alpha'; 'leeb', 'advert', 'Billmeart' C': 1, 'max iter', '10000, 'penalty'; '2, 'advert', 'Billmeart' G': 1, 'max iter', '10000, 'penalty'; '2, 'advert', 'Billmeart', '300 forming rate'; 11, 'max depth'; 14, 'min samples split'; 2, 'n estimators'; 100, 'max, iter'; 10000, 'solver', 'adam' C': 100, 'max iter', '10000, 'penalty'; '2, 'advert', 'Billmeart', '2, 'n estimators'; 100, 'max, iter'; 10000, 'solver', 'adam' C': 100, 'max iter', '10000, 'penalty'; '2, 'advert', 'Billmeart' criterion', 'ami, 'alpha'; 1000, 'penalty'; '2, 'advert', 'Billmeart' C': 100, 'max iter'; 10000, 'penalty'; '2, 'advert', 'Billmeart' criterion'; 'ami, 'ami, 'angle'; 'advert', 'Billmeart' criterion'; 'ami, 'ami, 'advert'; '2, 'advert', 'Billmeart' criterion'; 'ami, 'ami, 'advert'; 'advert', 'Billmeart' criterion'; 'ami, 'ami, 'advert', 'advert', 'advert', 'Billmeart' criterion'; 'ami, 'ami, 'advert', 'advert', 'Billmeart' criterion'; 'ami, 'advert', 'advert', 'Billmeart' criterion'; 'ami, 'ami, 'a
Outcome Usual activities Outcome	Outcome at 6 weeks 12 weeks 18 weeks Outcome at 6 weeks	MLP MLP Model LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR	0.662 Accuracy 0.693 0.705 0.670 0.659 0.744 0.707 0.671 0.683 0.683 0.688 0.714 Accuracy 0.545 0.830 0.714 Accuracy 0.545	0.628 (Specificity 0.759 0.948 0.828 0.931 0.783 0.881 0.826 0.717 0.826 0.717 0.826 0.755 0.800 0.625 (Specificity 0.560 0.973 0.827 0.827	0.706 Recall 0.567 0.233 0.367 0.133 0.694 0.472 0.472 0.694 0.472 0.694 0.472 0.694 0.568 0.811 Recall 0.462 0.000 0.077 0.231 0.462 0.402 0.402 0.402 0.402 0.567 0.233 0.567 0.133 0.567 0.133 0.569 0.472 0.472 0.568 0.567 0.568 0.567 0.568 0.567 0.568 0.567 0.568 0.567 0.568 0.567 0.573 0.568 0.567 0.573 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568 0.568	0.667 AUC 0.663 0.591 0.597 0.532 0.682 0.689 0.689 0.688 0.689 0.688 0.689 0.684 0.718 0.684 0.711 0.487 0.452 0.529 0.529 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.532 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.552 0.55	activation? 'tanh', 'alpha': 600, 'neuty stopping', 'True, 'hidden layer sizes' (100), 'max_iter': 10000, 'wolver'; 'adam' Hyperparameters C': 1, 'max_iter': 10000, 'penalty'; '12, 'wolver': 'newton-reg' circiterion'; 'gini', 'max_deph'; 18, 'max_samples aph'; 2, 'n estimators': 100 learning rate'; 10, 'new'; 'new 'new 'new 'new 'new 'new 'new 'new
Outcome Usual activities Outcome	Outcome at 6 weeks 12 weeks 18 weeks Outcome at 6 weeks	MLP MLP Model LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF RF EF	0.662 Accuracy 0.603 0.705 0.670 0.659 0.674 0.670 0.659 0.688 0.714 Accuracy 0.545 0.880 0.714 Accuracy 0.545 0.549 0.739	0.628 (Specificity 0.759 0.948 0.828 0.831 0.831 0.836 0.831 0.826 0.717 0.875 0.750 0.825 (Specificity 0.560 0.973 0.827 0.827 0.827	0.706 Recall 0.567 0.233 0.367 0.133 0.694 0.472 0.639 0.703 0.541 0.568 0.811 Recall 0.462 0.000 0.077 0.231 0.450 0.450	0.667 AUC 0.663 0.591 0.597 0.532 0.682 0.689 0.689 0.688 0.689 0.684 0.718 0.684 0.718 AUC 0.511 0.487 0.452 0.529 0.515 0.545 0.529 0.511 0.511 0.532 0.551 0.551 0.552 0.553 0.553 0.553 0.553 0.553 0.553 0.553 0.553 0.553 0.553 0.553 0.553 0.553 0.553 0.553 0.553 0.553 0.553 0.553 0.553 0.553 0.682 0.685 0.685 0.685 0.685 0.685 0.685 0.685 0.685 0.685 0.685 0.685 0.685 0.685 0.685 0.685 0.685 0.685 0.685 0.685 0.685 0.685 0.685 0.653 0.685 0.685 0.653 0.653 0.655 0.655 0.655 0.655 0.655 0.655 0.655 0.655 0.655 0.655 0.655 0.655 0.655 0.655 0.655 0.655 0.655 0.655 0.655 0.655 0.655 0.655 0.655 0.655 0.555 0.455 0.555 0.455 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555	sciwator's tank' alpha' coll, 'early stopping' True, 'hidden layer sizes' (100), 'max iter' 10000, 'solver'; 'adam' Hyperparameters C': 1, 'max iter', 10000, 'penalty' 12', 'aslver', 'howton-cg' cirreiron' 'gin', 'max depth'; 18, 'ma sample split', 2, 'n estimator'; 100 lowring rate': 10, 'kos'', 'kog kos', 'n estimator'; 500 ('1, 'max iter', '10000, 'penalty'; '2, 'aslver', 'Billerated' cirreiron', 'gin', 'max', 'depth'; 14, 'min sample split'; 2, 'n estimator'; 100 horning rate': 10, 'kos'', 'kog kos', 'n estimator'; 500 forming rate': 10, 'kos'', 'kos', ''solver', 'Billerated' cirreiron'; 'gin', 'max, depth'; 14, 'min sample split'; 2, 'n estimator'; 100 horning rate': 10, 'kos', 'exponentia', 'n estimator'; 500 forming rate': 10, 'kos', 'exponentia', 'n estimator'; 'kos', 'n estimator'; 'kos', 'n estimator'; 'kos',
Outcome Usual activities Outcome Mobility	Outcome at 6 weeks 12 weeks 18 weeks Outcome at 6 weeks 12 weeks	MLP MLP Model LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP	0.662 Accuracy 0.693 0.705 0.670 0.670 0.670 0.671 0.683 0.649 0.688 0.714 Accuracy 0.545 0.888 0.714 Accuracy 0.545 0.838 0.716 0.739 0.545 0.545 0.744 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.54 0.54	0.628 (Specificity 0.759 0.948 0.828 0.831 0.831 0.830 0.831 0.830 0.831 0.830 0.717 0.675 0.750 0.800 0.625 (Specificity 0.560 0.827 0.827 0.831 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.837 0.83700000000000000000000000000000000000	0.706 Recall 0.567 0.233 0.367 0.133 0.694 0.472 0.472 0.472 0.472 0.472 0.472 0.472 0.473 0.541 0.568 0.811 Recall 0.462 0.007 0.231 0.450 0.0300	0.667 AUC 0.663 0.591 0.592 0.632 0.649 0.6682 0.649 0.6682 0.6682 0.6684 0.718 AUC 0.515 0.543 0.452 0.529 0.452 0.529 0.515 0.543 0.5532 0.5543 0.5543 0.555 0.5543 0.555 0.5543 0.555 0.5543 0.555 0.5543 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555	activation? 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Outcome Usual activities Outcome Mobility	Outcome at 6 weeks 12 weeks 18 weeks 0utcome at 6 weeks 12 weeks	MLP MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB LR RF XGB LR RF XGB MLP LR RF	0.662 Accuracy 0.693 0.705 0.705 0.705 0.770 0.670 0.671 0.683 0.648 0.648 0.648 0.648 0.648 0.648 0.714 Accuracy 0.545 0.830 0.716 0.739 0.744 0.759 0.744 0.683	0.628 (Specificity 0.759 0.948 0.828 0.831 0.826 0.775 0.675 0.750 0.675 0.750 0.675 (Specificity 0.625 (Specificity 0.560 0.973 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.835 0.927 0.827 0.835 0.928 0.835 0.927 0.827 0.835 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.935 0.	0.706 Recall 0.567 0.233 0.367 0.133 0.694 0.472 0.472 0.472 0.472 0.472 0.472 0.472 0.472 0.472 0.472 0.4539 0.703 0.541 0.568 0.811 Recall 0.462 0.000 0.077 0.231 0.231 0.450 0.330	0.667 AUC 0.663 0.591 0.597 0.532 0.682 0.649 0.649 0.648 0.689 0.645 0.684 AUC 0.511 0.487 0.452 0.515 0.452 0.515 0.543 0.553 0.553 0.543 0.551 0.553 0.551 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.555 0.	sciwnion' tank' alpha' coll, 'enty stopping' True, 'hidden layer sizes' (100), 'max iter' 10000, 'solver'; 'adam' Hyperparameters C': 1, 'max iter', 10000, 'penalty'; 12', 'solver'; 'hewton-cg' crierion'' [sin'], 'max clpth?: 13, 'min samples split'; 2, 'n estimators'; 100 lowning rate': 10, 'low'; 'low cluster'; 000 'memion' intervent'; 1000, 'low'; 'low'; 'memion'; 100 lowning rate': 10, 'low'; 'low cluster'; 000 'memion'; 'max', 'low'; 'low'
Outcome Usual activities Outcome Mobility	Outcome at 6 weeks 12 weeks 18 weeks Outcome at 6 weeks 12 weeks	MLP MLP Model LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR	0.662 Accuracy 0.693 0.705 0.705 0.705 0.750 0.750 0.751 0.683 0.714 Accuracy 0.545 0.714 Accuracy 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 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Outcome Usual activities Outcome Mobility	Outcome at 6 weeks 12 weeks 18 weeks 0utcome at 6 weeks 12 weeks	MLP Model LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF RF XGB MLP	0.662 Accuracy 0.693 0.705 0.670 0.659 0.705 0.670 0.659 0.704 0.683 0.649 0.545 0.545 0.545 0.545 0.545 0.545 0.714 Accuracy 0.545 0.714 0.683 0.714 0.683 0.714 0.683 0.714 0.651 0.549 0.744 0.651 0.549 0.744 0.652 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.545 0.54 0.54	0.629 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'new', 'exponentia', 'ne stimators', 500 lowring, rate', 10, 'new', 'exponentia', 'newton-cg' criterion', 'gin', 'max_depk', 18, 'min_samples_phi', 2, 'ne stimators', 500 lowring, rate', 10, 'new', 'exponentia', 'newton-cg' criterion', 'gin', 'max_depk', 18, 'min_samples_phi', 2, 'ne stimators', 500 lowring, rate', 10, 'new', 'exponentia', 'neber, 'newton-cg' criterion', 'gin', 'max_depk', 18, 'min_samples_phi', 2, 'ne stimators', 100 lowring, rate', 10, 'new', 'pensentia', 'ne stimators', 500 criterion', 'gin', 'max_depk', 18, 'min_samples_phi', 2, 'ne stimators', 100 lowring, rate', 1000, 'newty stopping', 'True, hidden_layer_staes', (100, 50, 20), 'max_iter', 10000, 'wolver', 'adam' 'criterion', 'gin', 'max_depk', 18, 'min_samples_phi', 2, 'ne stimators', 500 criterion', 'gin', 'max_depk', 18, 'min_samples_phi', 2, 'ne stimators', 500 lowring, rate', 1000, 'newty', stopping', 'True, hidden_layer_staes', (105, 60, 30), 'max_iter', 10000, 'wolver', 'adam' 'Criterion', 'gin', 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Outcome Usual activities Outcome Mobility	Outcome at 6 weeks 12 weeks 18 weeks 0utcome at 6 weeks 12 weeks 18 weeks	MLP MLP Model LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB	0.662 Accuracy 0.693 0.705 0.705 0.705 0.759 0.759 0.744 0.683 0.683 0.649 0.688 0.714 Accuracy 0.545 0.830 0.714 0.683 0.714 0.683 0.714 0.683 0.714 0.683 0.714 0.683 0.714 0.6739 0.549 0.549 0.744 0.6739 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.549 0.559 0.549 0.559 0.559 0.559 0.559 0.559 0.750 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.659 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 0.559 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'solve': 'lables', 'a estimator': 500 learning rate': 100, 'solve', 'solve': 'lables', 'a estimator': 500 learning rate': 100, 'solve', 'solve': 'lables' 'lables', 'lables', 'lables', 'lab
Outcome Usual activities Outcome Mobility	Outcome at 6 weeks 12 weeks 18 weeks 0utcome at 6 weeks 12 weeks 18 weeks	MLP MLP MOdel LR RF XGB LR RF XGB LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP MLP MLP MLP MLP MLP MLP MLP MLP MLP	0.662 0.662 0.693 0.705 0.670 0.659 0.705 0.670 0.659 0.704 0.707 0.671 0.683 0.649 0.688 0.714 Accuracy 0.545 0.716 0.739 0.746 0.739 0.744 0.683 0.671 0.653 0.671 0.662 0.623 0.662 0.554	0.628 (Specificity 0.759 0.948 0.328 0.331 0.828 0.783 0.8891 0.826 0.717 0.825 0.750 0.625 0.750 0.625 0.973 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.827 0.828 0.828 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.835 0.83	0.706 Recall 0.233 0.367 0.333 0.367 0.472 0.472 0.472 0.472 0.472 0.472 0.472 0.472 0.472 0.472 0.472 0.472 0.472 0.472 0.472 0.472 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.451 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450 0.450	0.667 AUC 0.663 0.591 0.597 0.532 0.682 0.649 0.6739 0.682 0.689 0.689 0.689 0.689 0.689 0.689 0.689 0.689 0.511 0.487 0.511 0.487 0.511 0.452 0.515 0.543 0.553 0.559 0.559 0.554 0.559 0.559	activation", 'tanh', 'alpha': 6.01, 'entry stopping', 'True, 'hidden layer sizes'; (100), 'max_tter'; 10000, 'wolver'; 'adam' Hyperparameters C': 1, 'max_tter'; 10000, 'penalty'; 12', 'alwe'ri', 'heveto-cg' criterion''; 'alm', 'max_depk'; 18, 'min_samples_split'; 2, 'n_settimators'; 100 lowring rate'; 1.0, 'lows'; 'alpha'; 1.60, 'criterion'; 'alm', 'hidden layer sizes', (150, 60, 30), 'max_tter'; 10000, 'solver'; 'adam' criterion'; 'alm', 'max_depk'; 18, 'min_samples_split'; 2, 'n_settimators'; 100 lowring rate'; 1.0, 'nos'; 'exponentia', 'n_settimators'; 500 activation'; 'tenh', 'alpha'; 1.60, 'criterion'; 'alm'; 'n_settimators'; 500 criterion'; 'alm', 'max_depk'; 18, 'min_samples_split'; 2, 'n_settimators'; 500 criterion'; 'alm', 'max_depk'; 14, 'min_samples_split'; 2, 'n_settimators'; 500 criterion'; 'alm', 'max_depk'; 14, 'min_samples_split'; 2, 'n_settimators'; 500 criterion'; 'alm', 'max_depk'; 14, 'min_samples_split'; 2, 'n_settimators'; 500 criterion'; 'alm', 'max_depk'; 18, 'min_samples_split'; 2, 'n_settimators'; 100 izerivation'; 'alm', 'alpha'; 1000, 'penalty'; 12, 'alwe'; 'linkey'; 300 activation'; 'alm', 'max_depk'; 18, 'min_samples_split'; 2, 'n_settimators'; 100 izerivation'; 'reln', 'alpha'; 1000, 'neatry; isetoping'; 'Tuv, hidden layer_sizes'; (100, 00), 'max_tter'; 10000, 'solver'; 'adam' 'criterion'; 'alm', 'max_depk'; 18, 'min_samples_split'; 2, 'n_settimators'; 500 activation'; 'reln', 'alpha'; 1000, 'reatry; stopping'; Tuv, hidden layer_sizes'; (106, 60, 30), 'max_tter'; 10000, 'solver'; 'adam' 'criterion'; 'alm', 'max_depk'; 14, 'min_samples_split'; 2, 'n_settimators'; 500 activation'; 'reln', 'alpha'; 14, 'min_samples_split'; 2, 'n_settimators'; 500 activation'; 'reln', 'alpha'; 14, 'min_samples_split'; 2, 'n_settimators'; 500 activation'; 'reln', 'alpha'; 16, 'min_samples_split'; 2, 'n_settimators'; 500 activation'; 'reln', 'alpha'; 16, 'min_samples_split'; 2, 'n_settimators'; 500 activation'; 'reln', 'alpha'; 16, 'min_samples_split'; 2, 'n_settimators'; 500 activation'; 'reln', 'al

Table 4. Deterioration prediction results with hyperparameters used for model development.

Table 5. Improvement prediction results with hyperparameters used for model development.

Data		Improvement						
Outcome	Outcome at	Model	Accuracy	Specificity	Recall	AUC	Hyperparameters	
		LR	0.818	0.865	0.571	0.718	C': 100, 'max iter': 10000, 'penalty': 'l2', 'solver': 'newton-cg'	
	6 weeks	RF	0.864	1.000	0.143	0.571	criterion': 'gini', 'max depth': 18, 'min samples split': 2, 'n estimators': 500	
		XGB	0.807	0.932	0.143	0.538	learning rate': 1.0, 'loss': 'log loss', 'n estimators': 100	
		MLP	0.852	0.932	0.429	0.681	activation': 'relu', 'alpha': 1e-05, 'early stopping': True, 'hidden layer sizes': (100, 50, 20), 'max iter': 10000, 'solver': 'adam'	
		LR	0.825	0.829	0.800	0.814	C': 100, 'max iter': 10000, 'penalty': '12', 'solver': 'lbfgs'	
		RF	0.875	0.986	0.100	0.543	'criterion': 'gini', 'max depth': 14, 'min samples split': 2, 'n estimators': 100	
Physical well-being	12 weeks	XGB	0.888	0.957	0,400	0.679	learning rate': 0.1, 'loss': 'exponential', 'n estimators': 500	
		MLP	0.875	0.886	0.800	0.843	activation', 'relu', 'alpha', 0.001, 'early, stopping', True, 'hidden, laver, sizes', (100, 50, 20), 'max, iter', 10000, 'solver', 'adam',	
		LR	0.831	0.908	0.417	0.662	C'- 100 'max_iter': 10000 'nenalty': '12' 'solver': 'lbfrs'	
		RE	0.831	0.969	0.083	0.526	criterion': 'sini' 'may donth': 14 'min samplas enlit': 2 'n astimators': 100	
	18 weeks	XGB	0.844	0.954	0.250	0.602	Criction: gmi, max acpent ev, mm_simples_ppr. 2, n_commerciations too	
		MLP	0.831	0.954	0.167	0.560	anima_inter.org, ass. ws_exact, n_community.org, "hidden lawar sizes" (150.60.30) 'max_iter" 10000 'solver' 'adam'	
Outcome	Outcome et	Model	A 00001	SpeelBelty	Recall	AUC	activation : real, apart reads, carly acopying : rue, maaren ayer area (100, 00, 00), max_ref : 10000, sorter : adam	
Outcome	Outcome at	TP	0.501	o c22	0.450	0.541	C: 10 hoar itee 10000 honelty [2] lookee house of	
		DE	0.351	0.032	0.430	0.541	C. 10, max_net . 10000, penaty. 12, solver . neworks of a structure 100	
	6 weeks	hr	0.750	0.926	0.150	0.558	criterion: gint, max depth 118, min samples spin 22, n estimators: 100	
		AGB	0.739	0.882	0.250	0.566	learning_rate: 1.0, loss: log_loss', n_estimators: 500	
		MLP	0.693	0.676	0.750	0.713	activation': 'tanh', 'alpha': 0.01, 'early stopping': 'Irue, 'hidden_layer_sizes': (100, 50, 20), 'max_iter': 10000, 'solver': 'adam'	
		LR	0.671	0.776	0.200	0.488	C': 100, 'max_iter': 10000, 'penalty': '12', 'solver': 'liblinear'	
Social functioning	12 wooks	RF	0.817	1.000	0.000	0.500	criterion': 'entropy', 'max_depth': 14, 'min_samples_split': 2, 'n_estimators': 100	
boeini innetioning	12 00000	XGB	0.695	0.695	0.067	0.451	learning_rate': 1.0, 'loss': 'exponential', 'n_estimators': 500	
		MLP	0.744	0.866	0.200	0.533	activation': 'relu', 'alpha': 0.001, 'early stopping': True, 'hidden layer sizes': (100,), 'max iter': 10000, 'solver': 'adam'	
		LR	0.679	0.683	0.667	0.675	C': 100, 'max iter': 10000, 'penalty': 'l2', 'solver': 'liblinear'	
	40. 1	RF	0.833	0.983	0.333	0.658	criterion': 'entropy', 'max depth': 18, 'min samples split': 2, 'n estimators': 500	
	18 weeks	XGB	0.769	0.867	0.444	0.656	learning rate': 0.1, 'loss': 'exponential', 'n estimators': 500	
		MLP	0.744	0.750	0.722	0.736	activation': 'tanh' 'alnha': 0.01 'early stopping'. True 'hidden laver sizes': (150,60,30) 'max iter': 10000 'solver': 'adam'	
Outcome	Outcome at	Model	Accuracy	Specificity	Recall	AUC	Hunarnaramatars	
Outcome	ourcome ur	ID	0.602	0.662	0.400	0 591	Ci. 100 [max. item], 10000 [manufact], 121 [column], maximum or parameter is	
		DE	0.002	0.002	0.400	0.551	C. 100, max_iter 1.10000, penaty 1.12, sover 1. newtoned by a set of the start of 100	
	6 weeks	hr	0.750	0.941	0.100	0.521	crueron: gmi, max depth: 16, mm samples spit: 2, n estimators: 100	
		AGB	0.659	0.824	0.100	0.462	learning rate: 1.0, loss: 'exponential', 'n estimators': 500	
ŀ		MLP	0.523	0.574	0.350	0.462	activation: relu', 'alpha: 0.001, 'early stopping: True, 'hidden_layer_sizes': (150, 60, 30), 'max_iter: 10000, 'solver: 'adam'	
		LR	0.720	0.734	0.667	0.701	C': 100, 'max_iter': 10000, 'penalty': '12', 'solver': 'liblinear'	
Role functioning	12 wooks	RF	0.756	0.938	0.111	0.524	criterion': 'gini', 'max_depth': 18, 'min_samples_split': 2, 'n_estimators': 100	
itoic functioning	12 weeks	XGB	0.720	0.875	0.167	0.521	learning_rate': 1.0, 'loss': 'log_loss', 'n_estimators': 500	
		MLP	0.768	0.813	0.611	0.712	activation': 'tanh', 'alpha': 0.0001, 'early_stopping': True, 'hidden_layer_sizes': (150, 60, 30), 'max_iter': 10000, 'solver': 'adam'	
			0.010	0.959	0 699	0 770	C': 10, 'max iter': 10000, 'penalty': 'l2', 'solver': 'liblinear'	
		LR	0.818	0.852	0.000	0.110		
	10	LR RF	0.818	0.869	0.375	0.622	criterion': 'gini', 'max depth': 14, 'min samples split': 2, 'n estimators': 100	
	18 weeks	LR RF XGB	0.818 0.766 0.792	0.869 0.902	0.375	0.622 0.638	criterion': 'gini', 'max_depth': 14, 'min_samples_split': 2, 'n_estimators': 100 learning_rate': 1.0, 'loss': 'exponential', 'n_estimators': 500	
	18 weeks	LR RF XGB MLP	0.818 0.766 0.792 0.714	0.869 0.902 0.721	0.375 0.375 0.688	0.622 0.638 0.704	criterion': 'gini', 'max_depth': 14, 'min_samples_split': 2, 'n_estimators': 100 learning rate': 1.0, 'loss': 'exponential', 'n_estimators': 500 activation': 'mah', 'alpha': 0.01, 'early stopping: 'True, 'liidden layer_sizes': (100. 50, 20), 'max_iter': 10000, 'solver': 'adam'	
Outcome	18 weeks	LR RF XGB MLP Model	0.818 0.766 0.792 0.714 Accuracy	0.832 0.869 0.902 0.721 Specificity	0.375 0.375 0.688 Recall	0.622 0.638 0.704 AUC	criterion'; 'jani', 'max. depth': 14, 'min. samples. split': 2, 'n. edimators': 100 learning: rate': 1, 'n. Ses': exponential', 'n. estimators': 500 activation': 'tanh', 'alpha': 0.01, 'early_stopping': True, 'hidden_layer_sizes': (100, 50, 20), 'max_iter': 10000, 'solver': 'adam' - <i>Hycorrasameter</i> .	
Outcome	18 weeks Outcome at	LR RF XGB MLP Model	0.818 0.766 0.792 0.714 Accuracy 0.761	0.832 0.869 0.902 0.721 Specificity 0.797	0.375 0.375 0.688 Recall 0.571	0.622 0.638 0.704 AUC 0.684	criterion': 'gini', 'max_depth': 14, 'min_samples_split'.2, 'n_estimators': 100 learning_rate': 1.0, 'loos': exponential ', 'n_estimators': 500 extration': Tani, 'n_abha: 0.01, even's stopping: Tirue, 'hidden_layer_sizes': (100, 50, 20), 'max_iter': 10000, 'solver': 'adam' <u>Hyperparameters</u> C': 10, 'max_itars': 10000, 'non-site', '20' 'whome': 'materiance';	
Outcome	18 weeks Outcome at	LR RF XGB MLP Model LR RF	0.818 0.766 0.792 0.714 Accuracy 0.761 0.807	0.832 0.869 0.902 0.721 Specificity 0.797 0.905	0.375 0.375 0.688 Recall 0.571 0.286	0.622 0.638 0.704 AUC 0.684 0.596	criterion' j'ani', 'max, depth'; 14, 'min, samples split'; 2, 'n estimators'; 100 kaming rate'; 10, 'nes' 'exponential', n estimators'; 500 activation'; 'tanb', 'alpha': 0.01, 'early stopping': True, 'hidden Jayer, sizes'; (100, 50, 20), 'max_iter'; 10000, 'solver'; 'adam' D'experimente 'ani', 'max, iter'; 10000, 'penday': 'generatorsg' C': 10, 'max_iter'; 10000, 'penday': 'generatorsg' contention': 'ani', 'max_amble', 152', 'solver'; 'meetanorg';	
Outcome	18 weeks Outcome at 6 weeks	LR RF XGB MLP Model LR RF	0.818 0.766 0.792 0.714 Accuracy 0.761 0.807	0.832 0.869 0.902 0.721 Specificity 0.797 0.905	0.375 0.375 0.688 Recall 0.571 0.286	0.622 0.638 0.704 AUC 0.684 0.596	criterion'' jünl' 'max deph': 14, 'min samples aplit': 2, 'n estimators': 100 karning rate': 10, 'nosi 'exposential', n estimators': 500 activation': 'ranh', 'alpha': 0.01, 'early stopping'. True, 'hidden layer, sizes' (100, 50, 20), 'max, iter': 10000, 'solver': 'adam' Hyperparameters C: 10, 'max, iter': 10000, 'penaldy': 12', 'solver': 'newton-cg' criterion': 'jünl', 'max deph': 11', 'min samples aplit': 2, 'n estimators': 100	
Outcome	18 weeks Outcome at 6 weeks	LR RF MLP Model LR RF XGB	0.818 0.766 0.792 0.714 Accuracy 0.761 0.807 0.818 0.772	0.832 0.869 0.902 0.721 Specificity 0.797 0.905 0.892 0.892	0.375 0.375 0.688 Recall 0.571 0.286 0.429	0.622 0.638 0.704 AUC 0.684 0.596 0.660 0.622	criterion' jimi', 'max, depth'; 14, 'min, samples split'; 2, 'n estimators'; 100 karning rate'; 10, 'nes' 'exponential', n estimators'; 500 activation'; 'tanb', 'alpha'; 0.01, 'early stopping'; True, 'hidden jayer, sizes'; (100, 50, 20), 'max_iter'; 10000, 'solver'; 'adam' <u>Upperparameters</u> C; 10, 'max_iter'; 10000, 'pendby'; 'Ey, 'solver'; 'meetoneg' criterion'; 'jimi', 'max_depth'; 18, 'min, mapples, split'; 2, 'n estimators'; 100 karning, rate'; 10, 'kas'; 'kag, kas', 'n estimators'; 500 terming, rate'; 10, 'kas'; 'kag, kas', 'n estimators'; 500	
Outcome	18 weeks Outcome at 6 weeks	LR RF MLP Model LR RF XGB MLP	0.818 0.766 0.792 0.714 Accuracy 0.761 0.807 0.818 0.773 0.820	0.832 0.869 0.902 0.721 Specificity 0.797 0.905 0.892 0.838	0.375 0.375 0.688 Recall 0.571 0.286 0.429 0.429	0.622 0.638 0.704 AUC 0.684 0.596 0.660 0.633	criterion' jiml', 'max depth': 14, 'min samples split': 2, 'n estimators': 100 kardivation': 'tanh', 'lobe': 'coposential', 'n estimators': 500 activation': 'tanh', 'lapha': 2011, 'early stopping': 'Irue, 'laidden layer, sizes' (100, 50, 20), 'max iter': 10000, 'solver': 'adam' Hyperparameters C': 10, 'max iter': 10000, 'penalty': 12', 'solver': 'newton-cg' criterion': 'gin', 'max depth': 18, 'min samples split': 2, 'n estimators': 100 fearning rate: 10, 'lose': 'log lose, 'n estimators': 500 fearning rate: 10, 'lose': 'log lose, 'n estimators': 500	
Outcome	18 weeks Outcome at 6 weeks	LR RF MLP Model LR RF XGB MLP LR	0.818 0.766 0.792 0.714 Accuracy 0.761 0.807 0.818 0.773 0.829 0.824	0.832 0.869 0.902 0.721 Specificity 0.797 0.905 0.892 0.838 0.861 0.861	0.375 0.375 0.688 Recall 0.571 0.286 0.429 0.429 0.429 0.429	0.622 0.638 0.704 AUC 0.684 0.596 0.660 0.633 0.731	criterion'; jenil, 'max, depth'; 14, 'min, samples split'; 2, 'n estimators'; 100 karning rate'; 10, 'loss' 'coponentia', n estimators'; 500 activation'; 'tanb', 'alpha'; 0.01, 'early stoppin; 'True, 'hidden layer, sizes'; (100, 50, 20), 'max_iter'; 10000, 'solver'; 'adam' <u>Hyperparameters</u> C: 10, 'max_iter'; 10000, 'penalty'; '2, 'solver'; 'mestoneg' criterion'; 'gin', 'max_depth'; 18, 'max_mapples_split'; 2, 'n estimators'; 100 karning rate'; 10, 'loss'; 'log loss', 'n estimators'; 520 activation; 'reln', 'alpha'; 1eod, 'early stopping; 'True, 'hidden_ layer, sizes'; (100, 50, 20), 'max_iter'; 10000, 'solver'; 'adam' C: 10, 'max, iter'; 1000, 'penalty'; 2, 'new; 'liminator'; 520	
Outcome Usual activities	18 weeks Outcome at 6 weeks 12 weeks	LR RF MLP Model LR RF XGB MLP LR RF	0.818 0.766 0.792 0.714 Accuracy 0.761 0.807 0.818 0.773 0.829 0.854	0.832 0.869 0.902 0.721 Specificity 0.797 0.905 0.892 0.838 0.861 0.958	0.375 0.375 0.688 Recall 0.571 0.286 0.429 0.429 0.429 0.600 0.100	0.622 0.638 0.704 AUC 0.684 0.596 0.660 0.633 0.731 0.529	criterion'; jimi', 'max depth': 14, 'min samples split': 2, 'n estimators': 100 barning rate': 10, 'loss' exponential', 'n estimators': 500 activation': 'nanh', 'alpha': 0.01, 'early stopping: 'True, 'bidden_layer, sizes': (100, 50, 20), 'max_iter': 10000, 'solver': 'ndam' Hyperparameters C: 10, 'max_iter': 10000, 'penalty': 12, 'solver': 'newton-cg' criterion': 'gini', 'max_edpt': 18, 'max_maphes split': 2, 'n estimators': 100 learning rate': 10, 'loss': log [loss', 'n estimators': 500 criterion': 'gini', 'max_iter': 10000, 'solver': 'hibinear' C: 100, 'max_iter': 10000, 'solver': 'libinear': 'libinear': 'libinear': 1000	
Outcome Usual activities	18 weeks Outcome at 6 weeks 12 weeks	LR RF XGB MLP Model LR RF XGB LR RF XGB	0.818 0.766 0.792 0.714 Accuracy 0.761 0.807 0.818 0.773 0.829 0.854 0.854	0.832 0.869 0.902 0.721 Specificity 0.797 0.905 0.892 0.838 0.861 0.958 0.917	0.375 0.375 0.688 Recall 0.571 0.286 0.429 0.429 0.600 0.100 0.300	0.622 0.638 0.704 AUC 0.684 0.596 0.660 0.633 0.731 0.529 0.608	criterion" jüni, "max depik' 14, "min samples aplit' 2, "n estimators" 100 kenning rate'i, 10, "ose" exponential", n estimators 500 activation" 'ranh, "alpha' 0.00, "early stopping". True, "hidden layer sizes" (100, 50, 20), "max iter': 10000, "solver': "adam" Hyperparameters (10), "max iter': 10000, "pendy 15," 20," "bevice-reg errors of the solution of the solution (2, 10), "max iter': 10000, "pendy 15," 20," and "bevice-reg errors of the solution	
Outcome Usual activities	18 weeks Outcome at 6 weeks 12 weeks	LR RF XGB MLP Model LR RF XGB MLP LR RF XGB MLP	0.818 0.766 0.792 0.714 Accuracy 0.761 0.807 0.818 0.773 0.829 0.854 0.841 0.829	0.832 0.869 0.902 0.721 Specificity 0.797 0.905 0.892 0.838 0.861 0.958 0.917 0.889	0.375 0.375 0.688 Recall 0.571 0.286 0.429 0.429 0.429 0.429 0.600 0.100 0.300 0.400	0.622 0.638 0.704 AUC 0.684 0.596 0.660 0.633 0.731 0.529 0.608 0.608 0.644	criterion'; jiml', 'max_deph'; 14, 'min_samples quift'; 2, 'n estimators'; 100 maring rate'; 10, 'loss' 'exponential', 'n estimators'; 100 activation'; 'nanh', 'alpha'; 0001, 'early stopping; 'True, 'lubiden_layer, sizes'; (100, 50, 20), 'max_iter'; 10000, 'solver'; 'ndam' Hyperparameters C': 10, 'max_iter'; 10000, 'penalty'; 12,' 'solver'; 'newton-cg' criterion'; 'ginl', 'max_deph'; 18, 'min_samples quift'; 2, 'n estimators'; 100 learning rate'; 10, 'loss' 'exponential', 'I'rue, 'lubiden_layer, sizes'; (100, 50, 20), 'max_iter'; 10000, 'solver'; 'ndam' C': 100, 'max_iter'; 10000, 'penalty'; 12,' 'solver'; 'lubinea' C': 100, 'max_iter'; 10000, 'penalty'; 12,' 'solver'; 'lubinea' C': 100, 'max_iter'; 10000, 'solver'; 'lubinea'	
Outcome Usual activities	18 weeks Outcome at 6 weeks 12 weeks	LR RF XGB MLP Model LR RF XGB MLP LR KGB MLP LR	0.818 0.766 0.792 0.714 Accuracy 0.761 0.807 0.818 0.773 0.829 0.854 0.854 0.829 0.896	0.832 0.869 0.902 0.721 Specificity 0.797 0.905 0.892 0.838 0.861 0.958 0.917 0.889 0.896	0.375 0.375 0.688 Recall 0.571 0.286 0.429 0.429 0.429 0.429 0.429 0.400 0.100 0.300 0.400 0.900	0.622 0.638 0.704 AUC 0.684 0.596 0.660 0.633 0.731 0.529 0.608 0.644 0.898	criterion' join', 'max deph': 14, 'min samples split': 2, 'n estimators': 100 karning rate': 10, 'nes' responsating', 'n estimators': 500 activation': 'mah,' alpha': 0.01, 'early stopping': 'mewtoneg' C': 10, 'max, iter': 1000, 'pennyl', 'l', 'solver': 'mewtoneg' criterion': 'gin', 'max deph': 18, 'min samples split': 2, 'n estimators': 100 forming rate': 10, 'loss': 'tog toss': 'n estimators': 500 'loss' responsation': 'max', 'loss': 'n estimators': 500 'loss': 'loss': 'los	
Outcome Usual activities	18 weeks Outcome at 6 weeks 12 weeks	LR RF XGB MLP Model LR RF XGB MLP LR RF XGB MLP LR RF	0.818 0.766 0.792 0.714 Accuracy 0.761 0.807 0.818 0.773 0.829 0.854 0.841 0.829 0.854 0.849 0.896 0.909	0.832 0.869 0.902 0.721 Specificity 0.797 0.905 0.892 0.838 0.958 0.917 0.889 0.889 0.889 0.985	0.375 0.375 0.688 Recall 0.571 0.286 0.429 0.429 0.429 0.429 0.429 0.400 0.100 0.300 0.400 0.400	0.622 0.638 0.704 AUC 0.684 0.596 0.660 0.633 0.731 0.529 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.	criterion"; jüni, 'max_depit.'14, 'min_sample_split'.2, 'n_ estimators': 100 Hearing_rats': 1, 0.06*, 'exponentia', 'n_ estimators': 500 activation': 'mah', 'alpha': 0.01, 'early stopping.' True, 'halden layer sizes'; (100, 50, 20), 'max_iter': 10000, 'solver': 'ndam' C: 10, 'max_iter', '10000, 'pensity': 'golver', 'm/grapprammeters' c: 10, 'max_iter', '10000, 'pensity': 'golver', 'm/grapprammeters' c: 10, 'max_iter', '10000, 'pensity': 'golver', 'm/grapprammeters' 100 c: 10, 'max_iter', '1000, 'pensity': 'golver', 'm/grapprammeters' 100 activation: 'reld', 'alpha': 'local', 'arguity a contrastors': 500 activation: 'reld', 'alpha': 'local', 'golver', 'm/grapprammeters': 100 activation: 'reld', 'alpha': 'local', 'golver', 'm/grapprammeters': 'local' c: 'local', 'golver', 'm/grapprammeters': 'local', 'golver', 'm/grapp	
Outcome Usual activities	18 weeks Outcome at 6 weeks 12 weeks 18 weeks	LR RF XGB MLP Model LR RF XGB MLP LR RF XGB MLP LR RF XGB	0.818 0.766 0.792 0.714 Accuracy 0.761 0.807 0.818 0.773 0.829 0.829 0.854 0.841 0.829 0.854 0.896 0.909	0.832 0.869 0.902 0.721 Specificity 0.797 0.905 0.892 0.838 0.861 0.958 0.958 0.958 0.896 0.896 0.896 0.895 0.985	0.375 0.375 0.688 Recall 0.571 0.286 0.429 0.429 0.429 0.429 0.429 0.420 0.100 0.100 0.300 0.400 0.400 0.400 0.800	0.622 0.638 0.704 AUC 0.684 0.596 0.660 0.633 0.731 0.529 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.608 0.	criterion' jimi', 'max depth': 14, 'min samples split': 2, 'n estimators': 100 learning rate': 10, 'nest' exponential', 'n estimators': 500 activation': 'mah,' apha': 0.01, 'early stopping': 'mewton-cg' criterion': jimi', 'max edpth': 18, 'min samples split': 2, 'n estimators': 100 learning rate': 10, 'loss': 'log loss', 'n estimators': 500 activation': 'max iner': 10000, 'penalty': 12,' solver': 'mewton-cg' criterion': jimi', 'max edpth': 18, 'min samples split': 2, 'n estimators': 100 learning rate': 10, 'loss': 'log loss', 'n estimators': 500 activation': 'edn', 'max iner': 10000, 'honearty, 'n solver': 'mahnao' C: 100, 'max iner': 10000, 'honearty: 2,' solver': 'mewton-cg' criterion': 'jimi', 'max edpth': 18, 'min samples split': 2, 'n estimators': 100 activation': 'edn', 'may 'n solver': 'mahnao' C: 100, 'max iner': 10000, 'honearty: 2,' solver': 'mewton-cg' criterion': 'jimi', 'max depth': 14, 'min samples split': 2, 'n estimators': 100 konning rate': 10, 'loss': 'log loss', 'n estimators': 500	
Outcome Usual activities	18 weeks Outcome at 6 weeks 12 weeks 18 weeks	LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP	0.818 0.792 0.714 Accuracy 0.761 0.807 0.818 0.773 0.829 0.829 0.829 0.841 0.841 0.841 0.841 0.841 0.841 0.841 0.857	0.832 0.869 0.902 0.721 Specificity 0.797 0.905 0.892 0.838 0.958 0.917 0.889 0.985 0.985 0.985 0.985 0.925 0.851	0.375 0.375 0.688 Recall 0.571 0.286 0.429 0.429 0.429 0.429 0.429 0.429 0.400 0.300 0.400 0.400 0.400 0.400 0.400 0.800 0.900	0.622 0.638 0.704 AUC 0.684 0.596 0.660 0.633 0.731 0.529 0.608 0.608 0.608 0.608 0.693 0.693 0.863 0.863 0.875	criterion"; jünl, 'max deph', 14, 'min samples aplit', 2, 'n estimators': 100 kenning rate'; 10, 'loss' exponential', no estimators': 100 activation 'ranh', 'lapha': 0.001, 'early' stopping' True, 'hidden layer sizes' (100, 50, 20), 'max iter': 10000, 'solver': 'adam' C 10, 'max iter', '1000, 'panely' stopping' True, 'hidden layer sizes' (100, 50, 20), 'max iter': 10000, 'solver': 'adam' C 10, 'max iter', '1000, 'panely' stopping' True, 'hidden layer sizes' (100, 50, 20), 'max iter': 10000, 'solver': 'adam' C 100, 'max iter', '1000, 'panely' '1, 'solver', 'hitden layer sizes' (100, 50, 20), 'max iter': 10000, 'solver': 'adam' C '100, 'max iter', '1000, 'panely' '1, 'solver', 'hitden layer sizes' (100, 50, 20), 'max iter': 10000, 'solver': 'adam' criterion'; 'celu', 'lapha': 100, 'panely', 'la, 'solver', 'hitden layer sizes' (100, 50, 20), 'max iter': '10000, 'solver': 'adam' criterion'; 'celu', 'lapha': 100, 'genty, 'la, 'solver', 'hitden layer sizes' (100, 50, 20), 'max iter': '1000, 'solver': 'adam' criterion'; 'celu', 'lapha': 0, 'lagh', 'lag	
Outcome Usual activities Outcome	18 weeks Outcome at 6 weeks 12 weeks 18 weeks Outcome at	LR RF XGB MLP Model LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP MDP MOdel	0.818 0.766 0.792 0.714 Accuracy 0.761 0.807 0.818 0.829 0.854 0.829 0.854 0.829 0.854 0.899 0.890 0.909 0.909 0.809	0.832 0.869 0.902 0.721 Specificity 0.797 0.905 0.892 0.838 0.958 0.917 0.889 0.917 0.889 0.917 0.889 0.925 0.925 0.925 0.851	0.375 0.375 0.688 Recall 0.571 0.286 0.429 0.429 0.429 0.429 0.420 0.400 0.300 0.400 0.400 0.400 0.400 0.800 0.800 Recall	0.622 0.638 0.704 AUC 0.684 0.596 0.660 0.633 0.731 0.529 0.608 0.644 0.898 0.693 0.863 0.863 0.863 0.865 AUC	criterion" jüni, "max depth: 14, 'min samples split: 2, 'n estimators': 100 activation': 'tanh," John': Osol, "early stopping: Thue, "hidden layer sizes' (100, 50, 20), 'max just': 100, 'solvert': 'ndam' Hyperparameters C: 10, 'max, iter': 1000, 'penalty': 12, 'solver': 'newton-cg' criterion': 'gini,' max depth: 18, 'min samples split: 2, 'n estimators': 100 learning rate': 10, 'loss'' log (see, 'n estimators': 500 criterion': 'gini,' max (depth: 18, 'min samples split: 2, 'n estimators': 100 'min sectors': 1000, 'penalty: '12, 'solver': 'induce' C: 100, 'max iter': 1000, 'penalty: '12, 'solver': 'induce' C: 100, 'max iter': 1000, 'penalty: '12, 'solver': 'induce' C: 100, 'max iter': 1000, 'newly': 22, 'solver': 'induce' C: 100, 'max iter': 1000, 'newly': 2, 'solver': 'induce' C: 100, 'max iter': 1000, 'newly': 2, 'solver': 'induce' criterion'' jini, 'max, depth: 14, 'min samples split: 2, 'n estimators': 100 criterion'' jini, 'max, depth: 14, 'min samples split: 2, 'n estimators': 100 criterion'' jini, 'max, depth: 14, 'min samples split: 2, 'n estimators': 100 criterion'' jini, 'nos'' big (ses, 'n estimators': 100 Hyperparameters	
Outcome Usual activities Outcome	18 weeks Outcome at 6 weeks 12 weeks 18 weeks Outcome at	LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF	0.818 0.766 0.792 0.714 Accuracy 0.761 0.807 0.807 0.818 0.773 0.829 0.854 0.854 0.849 0.854 0.849 0.854 0.849 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.854 0.855 0.854 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 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Outcome Usual activities Outcome	18 weeks Outcome at 6 weeks 12 weeks 18 weeks Outcome at	LR RF MLP Model LR RF XGB LR RF XGB MLP LR RF XGB MLP Model LR RF	0.818 0.766 0.792 0.714 Accuracy 0.761 0.807 0.807 0.818 0.829 0.854 0.829 0.854 0.829 0.854 0.829 0.855 Accuracy 0.852 0.852	0.859 0.869 0.902 0.721 0.797 0.905 0.892 0.838 0.861 0.958 0.917 0.889 0.889 0.889 0.889 0.885 0.925 0.855 0.925	0.375 0.375 0.688 Recall 0.571 0.286 0.429 0.429 0.429 0.429 0.429 0.429 0.400 0.300 0.400 0.400 0.400 0.800 0.800 0.800 0.800 0.800 0.800 0.800	0.622 0.638 0.704 AUC 0.684 0.596 0.660 0.633 0.731 0.529 0.608 0.644 0.898 0.693 0.863 0.863 0.863 0.863 0.865 AUC 0.624 0.624	criterion" jühl, "max depth? 14, "min sample split? 2, 'n estimators": 100 kerning rats?: 10, 'ness' exponential', 'n estimators': 500 cattvation' 'ranh," alpha': 0.01, 'early stopping: True, 'hidden layer sizes' (100, 50, 20), 'max iter': 10000, 'solver': 'ndam' Ci 10, 'max iter', '10000, 'penshy': 'gy 'lower', 'may 'lower' indam' criterion': 'gihl, 'max, depth?', 18, 'min sample, split? 2, 'n estimators': 100 criterion': 'gihl, 'max, depth?', 14, 'min sample, split? 2, 'n estimators': 100 criterion': 'gihl, 'max, depth?', 14, 'min sample, split? 2, 'n estimators': 100 criterion': 'gihl, 'max, depth?', 14, 'min sample, split? 2, 'n estimators': 100 criterion': 'gihl, 'max, depth?', 14, 'min sample, split? 2, 'n estimators': 100 criterion': 'gihl, 'max, depth?', 14, 'min sample, split? 2, 'n estimators': 100 criterion: 'gihl, 'max, depth?', 14, 'min sample, split? 2, 'n estimators': 100 criterion: 'gihl, 'max, depth?', 14, 'min sample, split? 2, 'n estimators': 100 criterion: 'gihl, 'max, depth?', 14, 'min sample, split? 2, 'n estimators': 100 criterion: 'gihl, 'max, depth?', 14, 'min sample, split? 2, 'n estimators': 100 criterion: 'gihl, 'max, depth?', 14, 'min sample, split? 2, 'n estimators': 100 criterion: 'gihl, 'max, depth?', 14, 'min sample, split? 2, 'n estimators': 100 criterion: 'gihl, 'max, depth?', 14, 'min sample, split? 2, 'n estimators': 100 criterion: 'gihl, 'max, depth?', 14, 'min sample, split? 2, 'n estimators': 100 criterion: 'gihl, 'max, depth?', 14, 'min sample, split? 2, 'n estimators': 100 criterion: 'gihl, 'max, depth?', 14, 'min sample, split? 2, 'n estimators': 100 criterion: 'gihl, 'min, '	
Outcome Usual activities Outcome	18 weeks Outcome at 6 weeks 12 weeks 18 weeks Outcome at 6 weeks	LR RF MLP Model LR RF XGB LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP Model LR RF	0.818 0.766 0.792 0.714 Accuracy 0.761 0.807 0.818 0.773 0.829 0.854 0.841 0.829 0.854 0.841 0.829 0.896 0.909 0.909 0.857 Accuracy 0.852 0.852	0.859 0.869 0.902 0.721 Specificity 0.797 0.905 0.892 0.892 0.838 0.958 0.958 0.958 0.958 0.958 0.925 0.886 0.925 0.8851 0.859 0.859	0.375 0.375 0.688 Recall 0.571 0.286 0.429 0.429 0.429 0.429 0.429 0.429 0.420 0.400 0.300 0.400 0.300 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 0.400 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'hidhen layer sizes', (100, 50, 30), 'max, iter', '1000, 'solver', 'ndam' criterion', 'edi, 'hidh', 'h	
Outcome Usual activities Outcome	18 weeks Outcome at 6 weeks 12 weeks 18 weeks 0 outcome at 6 weeks	LR RF MLP Model LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP	0.818 0.766 0.772 0.714 Accuracy 0.761 0.807 0.818 0.773 0.829 0.854 0.841 0.841 0.896 0.896 0.896 0.890 0.890 0.890 0.895 0.857 0.857 0.852 0.852 0.852	0.869 0.869 0.902 0.721 Specificity 0.797 0.905 0.892 0.882 0.861 0.917 0.889 0.917 0.889 0.918 0.985 0.925 0.985 0.925 0.985 0.925 0.985 0.925 0.935 Specificity 0.859 0.945 0.925 0.935 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 0.945 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0.898 0.664 0.898 0.863 0.863 0.863 0.863 0.863 0.863 0.863 0.865 0.829 0.624 0.624 0.624	criterion" jüni, 'max depth': 14, 'min sample split': 2, 'n estimators': 100 kardivation': 'nam', 'alpha': 0.01, 'early stopping': True, 'hidden layer sizes' (100, 50, 20), 'max iter': 10000, 'solver': 'ndam' C 101, 'max iter', '1000, 'penalty': 27, 'min', 'myterion.org criterion'', 'min', 'max', depth': 18, 'min samples split': 2, 'n estimators': 100 factivation': redu', 'alpha': 0.01, 'early 'stopping': True, 'hidden layer sizes' (100, 50, 20), 'max iter': 10000, 'solver', 'adam' C'. 100, 'max iter', '1000, 'penalty': 27, 'solver', 'Mintea' criterion'', 'fell, ''alpha': 100, 'early 'stopping': True, 'hidden layer sizes', (100, 50, 20), 'max iter', '10000, 'solver', 'adam' criterion'', 'fell, ''alpha': 0.01, early 'stopping': True, 'hidden layer sizes', (100, 50, 20), 'max iter', '10000, 'solver', 'adam' criterion'', 'fell, 'halph': 0.01, early 'stopping': True, 'hidden layer sizes', (100, 50, 20), 'max iter', '10000, 'solver', 'adam' criterion'', 'fell, 'halph': 0.01, early 'stopping': True, 'hidden layer sizes', (100, 50, 30), 'max iter', '10000, 'solver', 'adam' Hyperparameters C'. 1, 'max iter', 10000, 'penalty', 'ly, 'solver', 'Mintea' C'. 1, 'max iter', 10000, 'penalty', 'ly, 'solver', 'Mintea' C'. 1, 'max iter', 10000, 'penalty', 'ly, 'solver', 'Mintea', 'lo compareters', 100 criterion', 'inter', 'lo be', 'exponentia', 'lo compareters', 'lo compareters', 100 criterion', 'inter', 'lo be', 'exponentia', 'lo compareters', 'lo comp	
Outcome Usual activities Outcome	18 weeks Outcome at 12 weeks 18 weeks Outcome at 6 weeks	LR RF XGB MLP Model LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB	0.818 0.766 0.792 0.714 Accuracy 0.761 0.807 0.818 0.773 0.829 0.854 0.841 0.829 0.854 0.841 0.829 0.856 0.909 0.909 0.909 0.857 0.852 0.852 0.852 0.852 0.852	0.350 0.869 0.869 0.721 Specificity 0.795 0.905 0.892 0.838 0.861 0.958 0.917 0.889 0.917 0.889 0.917 0.889 0.935 0.945 0.925 0.851 Specificity 0.851 Specificity 0.851 0.851 0.851 0.949 0.949 0.949 0.949 0.951 0.851 0.855 0.949 0.949 0.949 0.949 0.955 0.849 0.955 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.955 0.855 0.955 0.855 0.955 0.855 0.955 0.855 0.955 0.855 0.955 0.955 0.855 0.955 0.855 0.955 0.955 0.855 0.955 0.855 0.955 0.855 0.955 0.855 0.955 0.855 0.955 0.855 0.955 0.855 0.955 0.855 0.955 0.855 0.955 0.855 0.955 0.855 0.955 0.855 0.955 0.855 0.955 0.855 0.955 0.855 0.955 0.855 0.955 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Outcome Usual activities Outcome	18 weeks Outcome at 6 weeks 12 weeks 18 weeks Outcome at 6 weeks	LR RF MLP Model LR RF KGB MLP LR RF KGB MLP LR RF MD LR RF MLP LR RF MLP LR RF RF MLP LR RF RF RF RF NGB MLP LR RF RF RF NGB MLP LR RF RF RF RF RF RF RF RF RF R	0.818 0.766 0.772 0.714 Accuracy 0.761 0.807 0.818 0.773 0.829 0.854 0.854 0.854 0.854 0.859 0.859 0.899 0.899 0.899 0.899 0.899 0.899 0.899 0.899 0.899 0.899 0.857 0.857 0.857 0.852 0.852 0.852 0.852 0.852	0.869 0.869 0.902 0.721 Specificity 0.797 0.905 0.892 0.801 0.838 0.861 0.958 0.917 0.838 0.917 0.838 0.917 0.838 0.917 0.838 0.917 0.858 0.925 0.855 0.925 0.855 0.925 0.849 0.910 0.849 0.910 0.849 0.910 0.849 0.910 0.849 0.910 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 0.925 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Outcome Usual activities Outcome Mobility	18 weeks Outcome at 6 weeks 12 weeks 18 weeks Outcome at 6 weeks 12 weeks	LR RF XGB MLP Model LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF	0.818 0.766 0.772 0.771 0.772 0.761 0.807 0.807 0.818 0.773 0.818 0.829 0.854 0.849 0.854 0.829 0.854 0.829 0.854 0.809 0.854 0.809 0.899 0.855 0.852 0.852 0.852 0.852 0.852 0.852 0.852	0.352 0.869 0.869 0.721 Specificity 0.795 0.905 0.892 0.838 0.381 0.851 0.889 0.385 0.917 0.889 0.895 0.895 0.885 0.885 0.885 0.885 0.885 0.885 0.925 0.885 0.925 0.885 0.949 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.919 0.910 0.919 0.919 0.910 0.919 0.910 0.919 0.910 0.919 0.910 0.919 0.910 0.919 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.910 0.9	0.375 0.375 0.6888 Recall 0.571 0.286 0.429 0.429 0.429 0.429 0.429 0.429 0.400 0.300 0.400 0.300 0.400 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.900 0.9000 0.900 0.9000 0.9000 0.9000 0.9000 0.9000 0.9000 0.9000 0.9000 0.90000 0.90000 0.900000000	0.622 0.638 0.704 AUCC 0.684 0.696 0.660 0.663 0.660 0.663 0.660 0.663 0.673 0.668 0.664 0.698 0.644 0.898 0.644 0.898 0.875 AUC 0.6829 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.733 0.733 0.733 0.733 0.733 0.733	criterion" jühl, "max depih 1:4, "min sample split", 2, 'n estimators": 100 kerning rats": 10, "loss" exponential", 'n estimators 3:00 cativation 'ranh," alpha': 0.01, "early stopping. True, "hidden layer sizes" (100, 50, 20), "max iter": 10000, 'solver': 'ndam' Ci 10, 'max iter': 10000, 'penshy': "golvery': 'my provident' stopping and the stopping and t	
Outcome Usual activities Outcome Mobility	18 weeks Outcome at 6 weeks 12 weeks 18 weeks 6 weeks 12 weeks	LR RF XGB MLP Model LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP RF XGB MLP	0.818 0.766 0.7792 0.7714 Accuracy 0.761 0.807 0.818 0.773 0.829 0.854 0.854 0.8454 0.8454 0.8454 0.8454 0.8454 0.8454 0.8454 0.8454 0.8454 0.8454 0.8454 0.8454 0.8454 0.852 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 0.8552 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'early, 'nogle': 'solver': 'buectorseg' criterion': 'gini, 'max depth: 14, 'min samples split: 2, 'n estimators': 100 Earlivation': 'early, 'logic': 'solver': 'buectorseg' criterion': 'gini, 'max depth: 14, 'min samples split: 2, 'n estimators': 100 Earlivation': 'early, 'logic': 'solver': 'buectorseg' criterion': 'gini, 'max depth: 14, 'min samples split: 2, 'n estimators': 100 Earlivation': 'early, 'logic': 'solver': 'buectorseg' criterion': 'gini, 'max depth: 14, 'min samples split: 2, 'n estimators': 100 Earlivation': 'early, 'logic': 'solver': 'buectorseg' criterion': 'gini, 'max depth: 14, 'min samples split: 2, 'n estimators': 100 Earlivation': 'early, 'logic': 'solver': 'logic': 'logic: 'logic: 'logic': 'logic:	
Outcome Usual activities Outcome Mobility	18 weeks Outcome at 6 weeks 12 weeks 18 weeks Outcome at 6 weeks 12 weeks	LR RF XGB MLP Model LR RF XGB LR RF XGB LR RF LR RF LR RF LR RF LR RF XGB MLP LR RF KGB MLP	0.818 0.766 0.792 0.761 0.807 0.818 0.873 0.818 0.873 0.818 0.829 0.854 0.829 0.854 0.829 0.854 0.829 0.854 0.999 0.999 0.909 0.909 0.909 0.909 0.909 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 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0.835 0.835 0.835 0.835 0.835 0.835 0	criterion" jühl, 'max depth': 14, 'min sample split': 2, 'n estimators': 100 activation 'ranh', 'alpha': 0.01, 'early stopping': True, 'hidden layer sizes' (100, 50, 20), 'max iter': 10000, 'solver': 'adam' C 10, 'max iter': 10000, 'penalty': 12, 'solver': 'linkinea': criterion'; 'reln', 'alpha': 0.01, 'early stopping': True, 'hidden layer sizes' (100, 50, 20), 'max iter': 10000, 'solver': 'adam' C 10, 'max iter': 10000, 'penalty': 12, 'solver': 'linkinea': criterion'; 'fell', 'max depth': 14, 'min samples split': 2, 'n estimators': 100 activation': 'reln', 'alpha': 100, 'penalty': 12, 'solver': linkinea': criterion'; 'fell', 'max depth': 14, 'min samples split': 2, 'n estimators': 100 activation': 'reln', 'alpha': 100, 'reln', 'gender': 'linkinea': criterion'; 'fell', 'max depth': 14, 'min samples split': 2, 'n estimators': 100 activation': 'reln', 'alpha': 10, 'oas': 'penalty: 14, 'min samples split': 2, 'n estimators': 100 activation': 'reln', 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Outcome Usual activities Outcome Mobility	18 weeks Outcome at 6 weeks 12 weeks 0utcome at 6 weeks 12 weeks	LR RF XGB MLP Model LR RF XGB LR RF XGB MLP LR RF XGB MLP LR RF XGB LR RF XGB LR RF XGB MLP LR RF RF XGB MLP LR RF RF RF RF RF RF RF RF RF RF RF RF RF	0.818 0.766 0.7702 0.7714 Accuracy 0.761 0.807 0.818 0.873 0.829 0.854 0.841 0.829 0.854 0.841 0.849 0.845 0.845 0.845 0.845 0.845 0.857 0.857 0.857 0.857 0.857 0.857 0.857 0.857 0.857 0.850 0.830 0.830 0.909	0.869 0.869 0.721 0.721 0.797 0.905 0.892 0.895 0.858 0.958 0.958 0.958 0.958 0.958 0.958 0.958 0.985 0.925 0.859 0.859 0.859 0.859 0.859 0.840 0.859 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 0.940 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Outcome Usual activities Outcome Mobility	18 weeks Outcome at 6 weeks 12 weeks 18 weeks 0 utcome at 6 weeks 12 weeks 13 weeks	LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB MLP LR RF XGB	0.818 0.766 0.7792 0.761 Accuracy 0.807 0.807 0.807 0.818 0.773 0.829 0.854 0.841 0.829 0.854 0.841 0.896 0.896 0.890 0.857 Accuracy 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.855 0.852 0.855 0.852 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 0.855 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'10000, 'pennly': '12, 'solver': 'hientener': 100 kennig nret': 10, 'max', 'negles', 'negl	
Outcome Usual activities Outcome Mobility	18 weeks Outcome at 6 weeks 12 weeks 0utcome at 6 weeks 12 weeks 18 weeks	LR RF XGB MLP LR RF LR RF XGB MLP LR RF XGB MLP LR RF XGB LR RF LR RF LR RF XGB MLP LR RF XGB	0.818 0.766 0.762 0.772 0.714 0.714 0.711 0.807 0.857 0.857 0.852 0.856 0.909 0.909 0.909 0.909 0.909 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 0.852 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		I	well-being						
	Deterio	oration		Improvement					
Logistic regres	ssion	Random for	est	Logistic regre	ssion	Random for	est		
PWB_overall0	1.569433	PWB_overall0	0.133532	CMResCOPD	13.923359	PWB_overall0	0.221759		
CMRheuArth	1.149526	BCBMI	0.09927	CMCarMI	13.066001	BCBMI	0.073412		
CMStomInflamm	1.026601	FWB_overall0	0.081032	CMCarAngina	9.672283	EQ5DPain0	0.071416		
PrimaryorMet	0.879178	SWB_overall0	0.075772	CMEndDiabetes	4.327627	EQ5DVAS0	0.064324		
PreviousChemo	0.864974	EQ5DVAS0	0.066705	CMEndHyperth	4.285474	SWB_overall0	0.062971		
CMPrevMal	0.79102	DiseaseSite	0.050577	CMNeuStroke	3.695441	FWB_overall0	0.062633		
CMResCOPD	0.764014	DCEmployment	0.050358	CMEndHypothy	3.601606	ROL0	0.050095		
CMCarMI	0.59501	ROL0	0.050047	Comorbidities	2.922004	DiseaseSite	0.045489		
DiseaseSite	0.564434	PrimaryorMet	0.041654	CMCarHyperten	2.919881	ed_lev	0.038387		
CMEndDiabetes	0.501928	ed_lev	0.039405	PWB_overall0	2.850354	PrimaryorMet	0.035688		
CMRheuCTD	0.444377	EQ5DAnxDep0	0.034651	CMCarVenous	2.747976	DCEmployment	0.03415		
FWB_overall0	0.444371	DCMarital	0.030691	CMCarArrhythm	2.534306	DCMarital	0.028505		
CMEndHypothy	0.426059	EQ5DPain0	0.028751	PreviousChemo	2.414958	EQ5DUsuAct0	0.026227		
EQ5DAnxDep0	0.383677	EQ5DUsuAct0	0.028591	CMRheuArth	1.93644	Comorbidities	0.025013		
EQ5DPain0	0.364803	Comorbidities	0.028133	PrimaryorMet	1.54155	EQ5DAnxDep0	0.024492		
CMCarVenous	0.332789	EQ5DMob0	0.021961	CMResAsthma	1.499618	EQ5DMob0	0.020482		
CMResAsthma	0.289044	StudyArm	0.019965	CMPrevMal	1.319404	StudyArm	0.020222		
StudyArm	0.28145	PreviousChemo	0.016012	CMSubstAlcohol	1.042471	PreviousChemo	0.013142		
BCBMI	0.252698	CMCarHyperten	0.015805	DiseaseSite	0.893342	CMEndDiabetes	0.013136		
CMEndHyperth	0.243022	CMResCOPD	0.012084	ed_lev	0.864195	CMCarHyperten	0.01048		
CMGasPancreas	0.228956	CMResAsthma	0.011007	EQ5DVAS0	0.832183	CMEndHypothy	0.009797		
ROL0	0.224995	EQ5DSelCar0	0.010529	EQ5DSelCar0	0.796896	EQ5DSelCar0	0.009597		
CMStomUlcers	0.200148	CMPrevMal	0.009927	CMGasPancreas	0.74042	CMPrevMal	0.008038		
CMNeuStroke	0.197854	CMEndDiabetes	0.009848	CMRheuLupus	0.703934	CMResAsthma	0.006365		
CMRenEndStage	0.178679	CMCarMI	0.006526	BCBMI	0.599315	CMCarAngina	0.004794		
ed_lev	0.135084	CMEndHypothy	0.006286	FWB_overall0	0.560101	CMCarMI	0.003373		
Comorbidities	0.127383	CMStomInflamm	0.004816	CMNeuParkins	0.392506	CMEndHyperth	0.002924		
CMCarAngina	0.123243	CMCarVenous	0.004777	CMStomInflamm	0.349838	CMCarVenous	0.002866		
EQ5DVAS0	0.110928	CMCarAngina	0.002398	DCEmployment	0.189108	CMNeuParkins	0.00223		
CMCarArrhythm	0.106706	CMNeuStroke	0.001957	DCMarital	0.180942	CMResCOPD	0.001576		
SWB_overall0	0.102555	CMRheuArth	0.001828	EQ5DMob0	0.171249	CMCarArrhythm	0.001128		
DCEmployment	0.100668	CMRheuLupus	0.001095	CMStomUlcers	0.149692	CMRheuArth	0.001108		
EQ5DMob0	0.081411	CMCarArrhythm	0.000916	ROL0	0.100497	CMStomInflamm	0.001044		
CMCarHeartFail	0.078057	CMRheuCTD	0.000801	SWB_overall0	0.099762	CMNeuStroke	0.000839		
CMSubstAlcohol	0.076215	CMEndHyperth	0.000681	EQ5DAnxDep0	0.085732	CMGasPancreas	0.000631		
DCMarital	0.07464	CMGasPancreas	0.000615	StudyArm	0.080389	CMSubstAlcohol	0.00056		
EQ5DUsuAct0	0.022877	CMSubstAlcohol	0.000385	EQ5DUsuAct0	0.042851	CMRheuCTD	0.000482		
CMCarHyperten	0.012993	CMRenEndStage	0.000346	EQ5DPain0	0.042741	CMRheuLupus	0.00029		
EQ5DSelCar0	0.010388	CMStomUlcers	0.000227	CMRheuCTD	0.035837	CMStomUlcers	0.000284		
CMRheuLupus	0.010197	CMCarHeartFail	0.00004	CMResChronBron	0.005954	CMResChronBron	0.000052		
CMSubstDrugs	0	CMSubstDrugs	0	CMSubstDrugs	0	CMGasChronHep	0		
CMResChronBron	0	CMGasChronHep	0	CMStomMalabsor	0	CMRheuRhPolymy	0		
CMStomMalabsor	0	CMResChronBron	0	CMRheuRhPolymy	0	CMResEmphys	0		
CMResEmphys	0	CMNeuMyasth	0	CMGasCirrhosis	0	CMRheuPolymyo	0		
CMRheuRhPolymy	0	CMNeuParkins	0	CMRheuPolymyo	0	CMSubstDrugs	0		
CMNeuMyasth	0	CMNeuMS	0	CMGasChronHep	0	CMNeuMyasth	0		
CMGasChronHep	0	CMGasCirrhosis	0	CMResEmphys	0	CMNeuMS	0		
CMNeuParkins	0	CMRheuRhPolymy	0	CMRenEndStage	0	CMCarHeartFail	0		
CMGasCirrhosis	0	CMRheuPolymyo	0	CMCarHeartFail	0	CMGasCirrhosis	0		
CMNeuMS	0	CMStomMalabsor	0	CMNeuMyasth	0	CMRenEndStage	0		
CMRheuPolymyo	0	CMResEmphys	0	CMNeuMS	0	CMStomMalabsor	0		

Table 6. Feature importance ranks for physical well-being changes at 18 weeks prediction models LR and RF.

Usual activities										
	Deterio	oration			Improv	/ement				
Logistic regres	ssion	Random for	est	Logistic regres	ssion	Random for	est			
EQ5DUsuAct0	2.348261	BCBMI	0.143117	CMSubstAlcohol	7.569993	EQ5DUsuAct0	0.252763			
CMRheuLupus	1.244129	EQ5DUsuAct0	0.129836	CMRheuArth	3.585515	ROL0	0.115769			
DiseaseSite	0.898524	DiseaseSite	0.077861	EQ5DUsuAct0	3.522745	PWB_overall0	0.08537			
CMPrevMal	0.865107	EQ5DVAS0	0.07398	CMCarVenous	2.355063	BCBMI	0.08323			
CMResAsthma	0.771298	SWB_overall0	0.068102	CMCarArrhythm	2.165607	EQ5DVAS0	0.063433			
CMCarHyperten	0.679204	PWB_overall0	0.062277	CMStomInflamm	2.008561	SWB_overall0	0.061488			
CMGasPancreas	0.663488	ROL0	0.060521	CMEndHypothy	1.993451	DCEmployment	0.039528			
CMEndHypothy	0.542003	DCEmployment	0.045276	CMRheuLupus	1.647547	EQ5DPain0	0.032502			
BCBMI	0.506767	EQ5DAnxDep0	0.0362	CMResCOPD	1.407293	DiseaseSite	0.026328			
CMRenEndStage	0.498677	DCMarital	0.03589	CMRheuCTD	1.285911	ed_lev	0.025657			
EQ5DPain0	0.497696	ed_lev	0.033316	CMCarHeartFail	1.135531	DCMarital	0.025267			
EQ5DSelCar0	0.47095	EQ5DPain0	0.032078	CMCarAngina	1.051474	EQ5DAnxDep0	0.023673			
CMResCOPD	0.446885	Comorbidities	0.027761	CMNeuParkins	1.035357	EQ5DMob0	0.023085			
CMCarVenous	0.422538	PrimaryorMet	0.024138	PWB_overall0	0.911066	Comorbidities	0.021449			
CMCarMI	0.40174	StudyArm	0.022059	CMNeuStroke	0.785979	EQ5DSelCar0	0.015177			
CMCarArrhythm	0.317881	EQ5DMob0	0.020994	BCBMI	0.7132	StudyArm	0.01505			
Comorbidities	0.280834	CMCarHyperten	0.017985	ed_lev	0.622446	PreviousChemo	0.013022			
ROL0	0.276591	PreviousChemo	0.013151	EQ5DMob0	0.60776	PrimaryorMet	0.012692			
CMEndDiabetes	0.266086	EQ5DSelCar0	0.011003	CMResAsthma	0.573449	CMPrevMal	0.009341			
StudyArm	0.258236	CMEndDiabetes	0.010222	EQ5DVAS0	0.556679	CMCarHyperten	0.00828			
EQ5DAnxDep0	0.254403	CMPrevMal	0.009266	PreviousChemo	0.515102	CMResAsthma	0.00717			
CMStomInflamm	0.24441	CMResAsthma	0.008121	ROL0	0.472313	CMResCOPD	0.005677			
EQ5DMob0	0.236114	CMEndHypothy	0.006361	CMEndHyperth	0.433106	CMCarMI	0.005379			
CMRheuArth	0.224756	CMSubstAlcohol	0.003922	CMPrevMal	0.405182	CMCarVenous	0.005169			
CMCarAngina	0.176192	CMCarMI	0.003742	EQ5DAnxDep0	0.362858	CMEndHypothy	0.004344			
EQ5DVAS0	0.164569	CMRheuArth	0.003689	StudyArm	0.336571	CMEndDiabetes	0.004095			
CMRheuCTD	0.150602	CMCarVenous	0.003277	SWB_overall0	0.327688	CMCarArrhythm	0.002829			
DCEmployment	0.142009	CMResCOPD	0.002494	Comorbidities	0.162286	CMCarAngina	0.00265			
CMSubstAlcohol	0.136974	CMStomInflamm	0.002476	DCMarital	0.153898	CMRheuArth	0.002563			
DCMarital	0.115902	CMRheuLupus	0.002339	PrimaryorMet	0.135378	CMSubstAlcohol	0.002274			
CMNeuParkins	0.104832	CMGasPancreas	0.002232	CMRenEndStage	0.11648	CMStomInflamm	0.001276			
CMNeuStroke	0.097995	CMCarAngina	0.001642	CMCarMI	0.109787	CMRheuLupus	0.000868			
PrimaryorMet	0.096108	CMRenEndStage	0.001634	CMEndDiabetes	0.098698	CMEndHyperth	0.000723			
PreviousChemo	0.082822	CMResChronBron	0.000892	CMStomUlcers	0.091996	CMRheuCTD	0.00058			
SWB overall0	0.071112	CMNeuStroke	0.000826	CMGasPancreas	0.084078	CMRenEndStage	0.000444			
CMResChronBron	0.063813	CMCarArrhythm	0.000588	EQ5DSelCar0	0.076894	CMCarHeartFail	0.000305			
ed lev	0.062876	CMEndHyperth	0.00042	DCEmployment	0.063975	CMNeuParkins	0.000191			
CMEndHyperth	0.058035	CMRheuCTD	0.000215	CMCarHyperten	0.04455	CMResChronBron	0.000177			
PWB_overall0	0.025423	CMNeuParkins	0.000096	EQ5DPain0	0.037622	CMNeuStroke	0.000131			
CMGasChronHep	0	CMCarHeartFail	0	DiseaseSite	0.027685	CMStomUlcers	0.000052			
CMCarHeartFail	0	CMGasChronHep	0	CMResChronBron	0.000317	CMGasCirrhosis	0			
CMResEmphys	0	CMResEmphys	0	CMSubstDrugs	0	CMResEmphys	0			
CMRheuPolymyo	0	CMSubstDrugs	0	CMGasCirrhosis	0	CMSubstDrugs	0			
CMRheuRhPolymy	0	CMRheuRhPolymy	0	CMGasChronHep	0	CMGasPancreas	0			
CMStomUlcers	0	CMGasCirrhosis	0	CMRheuRhPolymy	0	CMRheuPolymyo	0			
CMStomMalabsor	0	CMNeuMyasth	0	CMResEmphys	0	CMNeuMyasth	0			
CMSubstDrugs	0	CMNeuMS	0	CMRheuPolymyo	0	CMNeuMS	0			
CMNeuMS	0	CMStomMalabsor	0	CMStomMalabsor	0	CMGasChronHep	0			
CMNeuMyasth	0	CMStomUlcers	0	CMNeuMyasth	0	CMStomMalabsor	0			
CMGasCirrhosis	0	CMRheuPolymyo	0	CMNeuMS	0	CMRheuRhPolymy	0			
CMRheuPolymyo	0	CMResEmphys	0	CMNeuMS	0	CMStomMalabsor	0			

Table 7. Feature importance ranks for usual activities changes at 18 weeks prediction models LR and RF.

			Mob	oility					
	Deterio	oration		Improvement					
Logistic regres	ssion	Random for	est	Logistic regre	ssion	Random forest			
CMResChronBron	5.681567	FWB overall0	0.1055	CMEndHyperth	5.327951	EQ5DMob0	0.318964		
CMGasPancreas	4.960102	SWB_overall0	0.091013	EQ5DMob0	4.080502	BCBMI	0.078401		
CMCarHeartFail	4.945931	PWB_overall0	0.077668	CMCarAngina	3.690014	FWB_overall0	0.070807		
CMCarArrhythm	4.130466	EQ5DVAS0	0.073442	CMResCOPD	3.684776	DiseaseSite	0.068345		
CMCarMI	3.865736	DiseaseSite	0.051927	CMCarVenous	2.94743	SWB_overall0	0.055995		
CMSubstAlcohol	3.775084	DCEmployment	0.048892	CMResChronBron	2.584025	PWB_overall0	0.051819		
CMEndHyperth	3.298455	ed_lev	0.040528	CMNeuParkins	2.409078	EQ5DPain0	0.048225		
CMResCOPD	3.033808	EQ5DAnxDep0	0.040475	CMCarHyperten	2.35333	EQ5DVAS0	0.042132		
CMRheuArth	2.903339	Comorbidities	0.034333	CMResAsthma	2.132524	DCMarital	0.038277		
CMRheuLupus	2.42351	DCMarital	0.034039	PreviousChemo	2.022009	EQ5DUsuAct0	0.037502		
CMCarVenous	1.366612	EQ5DUsuAct0	0.033967	CMCarMI	1.74107	DCEmployment	0.026439		
CMEndDiabetes	1.287484	EQ5DPain0	0.033657	CMEndDiabetes	1.617783	Comorbidities	0.021263		
CMResAsthma	1.202195	StudyArm	0.020932	CMEndHypothy	1.571741	EQ5DAnxDep0	0.015872		
PreviousChemo	1.0179	PrimaryorMet	0.019977	Comorbidities	1.328023	ed lev	0.014929		
CMNeuParkins	0.761727	EQ5DMob0	0.018281	DiseaseSite	1.312387	CMCarHyperten	0.01356		
BCBMI	0.651666	CMResAsthma	0.013156	SWB overall0	1.307746	PrimaryorMet	0.012237		
DiseaseSite	0.57739	PreviousChemo	0.013074	BCBMI	1.165174	PreviousChemo	0.011418		
CMPrevMal	0.561657	CMCarHyperten	0.011887	CMCarArrhythm	1.071283	StudyArm	0.00947		
PrimaryorMet	0.525226	CMPrevMal	0.010103	CMPrevMal	0.984691	EQ5DSelCar0	0.008962		
CMStomInflamm	0.514437	EQ5DSelCar0	0.009966	CMNeuStroke	0.911514	CMPrevMal	0.008718		
Comorbidities	0.489691	CMCarArrhythm	0.009579	EQ5DUsuAct0	0.856713	CMEndDiabetes	0.007119		
EQ5DPain0	0.463356	CMEndDiabetes	0.009069	FWB overall0	0.649634	CMCarMI	0.005435		
EQ5DMob0	0.433626	CMCarMI	0.008925	CMRheuArth	0.530132	CMResAsthma	0.005372		
CMNeuStroke	0.422049	CMRheuArth	0.008617	DCMarital	0.480517	CMEndHypothy	0.005295		
EQ5DAnxDep0	0.41443	CMEndHypothy	0.008269	PrimaryorMet	0.457481	CMCarAngina	0.003963		
EQ5DSelCar0	0.396671	CMResCOPD	0.003547	StudyArm	0.292456	CMEndHyperth	0.003086		
EQ5DVAS0	0.283777	CMCarVenous	0.003416	CMStomInflamm	0.249998	CMCarArrhythm	0.002581		
ed lev	0.263051	CMRheuLupus	0.00247	EQ5DSelCar0	0.224756	CMCarVenous	0.002577		
CMCarHyperten	0.117272	CMStomInflamm	0.002402	CMRheuLupus	0.161346	CMResCOPD	0.002568		
CMEndHypothy	0.10792	CMNeuStroke	0.002397	CMSubstAlcohol	0.118481	CMRheuArth	0.002414		
CMCarAngina	0.087238	CMGasPancreas	0.001793	CMGasPancreas	0.10859	CMResChronBron	0.002178		
FWB_overall0	0.0783	CMCarHeartFail	0.001535	CMRenEndStage	0.1067	CMStomInflamm	0.001095		
EQ5DUsuAct0	0.073808	CMEndHyperth	0.001213	EQ5DVAS0	0.095971	CMNeuParkins	0.001007		
DCMarital	0.057833	CMSubstAlcohol	0.001119	EQ5DAnxDep0	0.092543	CMSubstAlcohol	0.000952		
PWB_overall0	0.057653	CMCarAngina	0.000915	ed_lev	0.087568	CMNeuStroke	0.000509		
StudyArm	0.048044	CMResChronBron	0.000548	EQ5DPain0	0.075561	CMRheuLupus	0.000224		
SWB_overall0	0.039861	CMNeuParkins	0.000193	DCEmployment	0.074864	CMGasPancreas	0.000151		
DCEmployment	0.030947	CMResEmphys	0	PWB_overall0	0.00146	CMCarHeartFail	0.00014		
CMResEmphys	0	CMSubstDrugs	0	CMRheuCTD	0.000971	CMStomMalabsor	0		
CMGasChronHep	0	CMRheuRhPolymy	0	CMCarHeartFail	0.000414	CMSubstDrugs	0		
CMGasCirrhosis	0	CMGasChronHep	0	CMStomUlcers	0	CMGasCirrhosis	0		
CMStomUlcers	0	CMRheuCTD	0	CMNeuMyasth	0	CMGasChronHep	0		
CMRheuPolymyo	0	CMNeuMyasth	0	CMStomMalabsor	0	CMRheuRhPolymy	0		
CMRheuRhPolymy	0	CMNeuMS	0	CMGasChronHep	0	CMRheuPolymyo	0		
CMRenEndStage	0	CMRenEndStage	0	CMGasCirrhosis	0	CMRheuCTD	0		
CMNeuMS	0	CMStomMalabsor	0	CMResEmphys	0	CMResEmphys	0		
CMSubstDrugs	0	CMStomUlcers	0	CMRheuRhPolymy	0	CMNeuMyasth	0		
CMNeuMyasth	0	CMGasCirrhosis	0	CMRheuPolymyo	0	CMNeuMS	0		
CMRheuCTD	0	CMRheuPolymyo	0	CMNeuMS	0	CMRenEndStage	0		
CMStomMalabsor	0			CMSubstDrugs	0	CMStomUlcers	0		
CMRheuPolymyo	0	CMResEmphys	0	CMNeuMS	0	CMStomMalabsor	0		

Table 8. Feature importance ranks for mobility changes at 18 weeks prediction models LR and RF.