

Table 1. Model results and hyperparameters

Admissions during chemotherapy							hyperparameters	
Model	accuracy	balanced accuracy	specificity	precision	recall	f1 score	AUROC	
Including PROMs	LR	0.689	0.682	0.683	0.348	0.672	0.459	C: 0.1, 'max_iter': 10000, 'penalty': 'l2', 'solver': 'newton-qg'
	RF	0.959	0.918	0.985	0.932	0.852	0.890	'criterion': 'gini', 'max_depth': 14, 'min_samples_split': 2, 'n_estimators': 500
	MLP	0.903	0.913	0.897	0.688	0.930	0.791	'activation': 'tanh', 'alpha': 1e-05, 'early_stopping': True, 'hidden_layer_sizes': (150, 60, 30), 'max_iter': 10000, 'solver': 'adam'
	XGB	0.959	0.912	0.989	0.947	0.836	0.888	'learning_rate': 0.1, 'max_depth': 7, 'min_child_weight': 4, 'subsample': 1
Excluding PROMs	LR	0.669	0.670	0.668	0.331	0.672	0.443	C: 0.1, 'max_iter': 10000, 'penalty': 'l2', 'solver': 'lbfgs'
	RF	0.948	0.891	0.985	0.927	0.797	0.857	'criterion': 'gini', 'max_depth': 18, 'min_samples_split': 2, 'n_estimators': 500
	MLP	0.873	0.859	0.882	0.633	0.836	0.721	'activation': 'tanh', 'alpha': 0.0001, 'early_stopping': True, 'hidden_layer_sizes': (150, 60, 30), 'max_iter': 10000, 'solver': 'adam'
	XGB	0.956	0.907	0.987	0.938	0.828	0.880	'learning_rate': 0.1, 'max_depth': 7, 'min_child_weight': 5, 'subsample': 1
Admissions within 14 days of a report							hyperparameters	
Model	accuracy	balanced accuracy	specificity	precision	recall	f1 score	AUROC	
Including PROMs	LR	0.718	0.662	0.724	0.110	0.600	0.186	C: 100, 'max_iter': 10000, 'penalty': 'l2', 'solver': 'lbfgs'
	RF	0.952	0.625	0.992	0.643	0.257	0.367	'criterion': 'log_loss', 'max_depth': 18, 'min_samples_split': 8, 'n_estimators': 100
	MLP	0.902	0.679	0.929	0.254	0.429	0.319	'activation': 'tanh', 'alpha': 0.0001, 'early_stopping': True, 'hidden_layer_sizes': (150, 60, 30), 'max_iter': 10000, 'solver': 'adam'
	XGB	0.946	0.581	0.990	0.500	0.171	0.255	'learning_rate': 0.1, 'max_depth': 5, 'min_child_weight': 5, 'subsample': 0.7
Excluding PROMs	LR	0.696	0.637	0.703	0.099	0.571	0.168	C: 0.01, 'max_iter': 10000, 'penalty': 'l2', 'solver': 'lbfgs'
	RF	0.951	0.570	0.997	0.714	0.143	0.238	'criterion': 'gini', 'max_depth': 14, 'min_samples_split': 2, 'n_estimators': 500
	MLP	0.917	0.579	0.958	0.212	0.200	0.206	'activation': 'relu', 'alpha': 1e-05, 'early_stopping': True, 'hidden_layer_sizes': (150, 60, 30), 'max_iter': 10000, 'solver': 'adam'
	XGB	0.951	0.610	0.992	0.615	0.229	0.333	'learning_rate': 0.1, 'max_depth': 7, 'min_child_weight': 5, 'subsample': 1