Supplementary

Table S1 Explanation of included predictors

	Variables	Explanation
Demographic data	Gender	Gender was recorded according to the medical records.
	Age	Age was recorded at the enrolled date.
	BMI	BMI was calculated based on weight and height at the enrolled year.
Treatment-related variables	Daily dose of ICS	We looked through patients' medication records for 12 months from the enrolled date to estimate the lowest dose of ICS that could achieve asthma control.
	Adherence	Good adherence was defined as follows: 1) The dose and frequency of ICS usage were in accordance with the doctor's prescription. 2) Regularly visit our allergy clinic every 3-6 months. Poor adherence was determined if patients did not meet the two criteria.
	Systematic steroids use	Short-term glucocorticoids, which were used for asthma intravenously or orally.
	Immunotherapy	Any kind of immunotherapy, e.g., dust, pollen.
Disease-related variables	Asthma severity	Asthma severity was defined according to GINA guidelines: Severe asthma: patients requiring high dose ICS-LABA (step 5). Moderate asthma: patients requiring low or medium dose ICS-LABA in either treatment track (steps 3-4). Mild asthma: patient with as-needed ICS-formoterol or low dose ICS plus as-needed SABA (steps 1-2).
	Asthma exacerbations	Asthma exacerbations were defined according to the ATS/ERS Statement: Severe asthma exacerbation should include 1) at least three days of systemic corticosteroid treatment or 2) a hospitalization/ED visit for asthma requiring systemic corticosteroids. Moderate asthma exacerbation should include 1) at least two days of symptoms and lung function deterioration, requiring increasing bronchodilator use, or 2) visits for asthma not requiring systemic corticosteroid intervention.
	Pneumonia history	Pneumonia history was determined if patients had at least one diagnosis of pneumonia from birth to the follow-up period.
	Atopy	Atopy was defined as having any positive Phadiatop test (≥0.35 KU/L) or positive skin prick test.
	Onset	A patient initially had asthma-related symptoms during the enrollment year.
	Allergic comorbidities	Allergic rhinitis, allergic conjunctivitis, eczema or dermatitis, and food allergy: a patient should have at least one diagnosis of one of the allergic diseases and a relevant prescription for these diseases in medical records.
Auxiliary examination	Blood routine examination	Blood routine examination was collected during the first year after enrollment if the patient had no evidence of infection.
	FeNO	FeNO was collected during the first year after enrollment.
	Total IgE	Total IgE was collected during the first year after enrollment.
	Baseline value of spirometry parameters	We recorded the best value of spirometry parameters performed when patients achieved asthma control in the first year after enrollment.

https://dx.doi.org/10.21037/jtd-23-1796

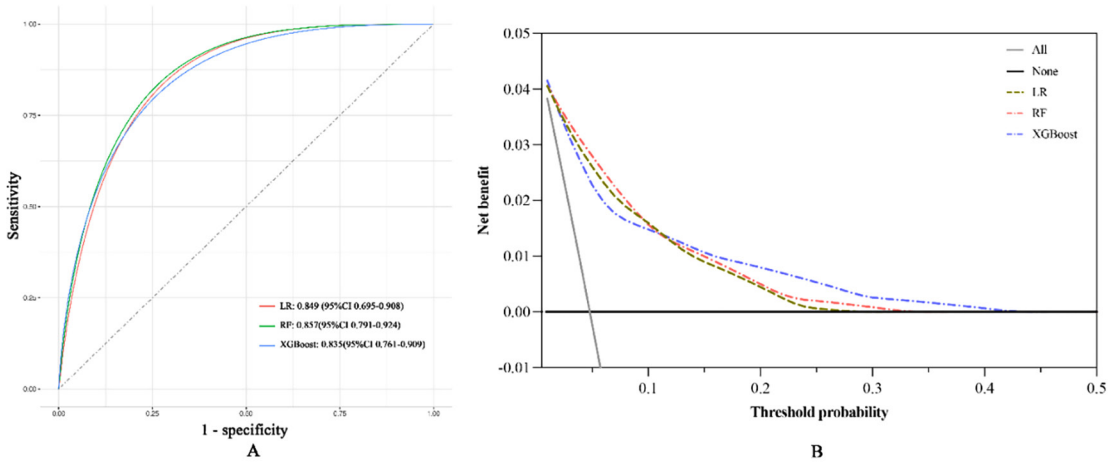

Figure S1 ROC curves and decision curve analysis of the three prediction models.

https://dx.doi.org/10.21037/jtd-23-1796

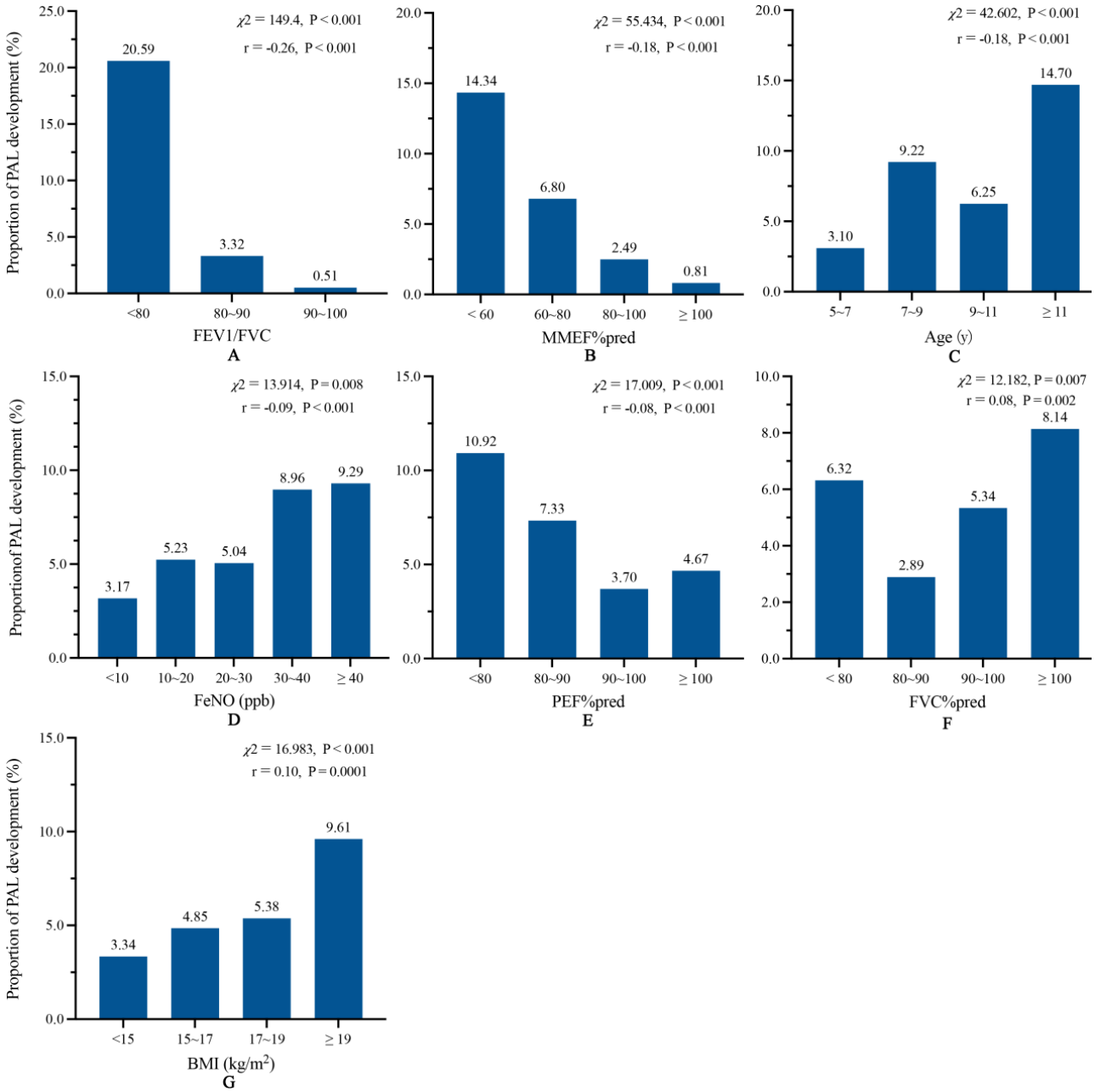

Figure S2 Top seven important predictors in prediction model. Chi-square tests were conducted to compare the proportions of PAL, and Spearman correlation analyses were performed to investigate the correlation between PAL and the identified predictors.

https://dx.doi.org/10.21037/jtd-23-1796

Table S2 The characteristics of participants in the temporal validation dataset

Characteristics	N1	NPAL (N=383)	N2	PAL (N=18)	
IPAL/RPAL	383	–	18	4/14	-
Female, n (%)	383	109 (28.4)	18	5 (27.8)	1.000
Age (years), median (IQR)	383	6.0 (5.0, 8.0)	18	9.0 (7.0, 10.0)	0.002
BMI (kg/m^2), median (IQR)	380	15.73 (14.57, 18.55)	18	16.42 (14.90, 21.11)	0.336
Onset, n (%)	383	190 (49.6)	18	8 (44.4)	0.852
Severe asthma, n (%)	383	25 (6.5)	18	4 (22.2)	0.033
Poor adherence, n (%)	383	116 (30.2)	18	8 (55.6)	0.046
Systematic steroids use, n (%)	383	27 (7.0)	18	3 (16.7)	0.143
Exacerbation, n (%)	383	35 (9.1)	18	3 (16.7)	0.238
Allergic rhinitis, n (%)	383	378 (98.7)	18	18 (100.0)	1.000
Allergic conjunctivitis, n (%)	383	54 (14.1)	18	1 (5.6)	0.488
Food allergy, n (%)	383	14 (3.6)	18	0 (0.0)	1.000
Eczema or dermatitis, n (%)	383	153 (39.9)	18	7 (38.9)	1.000
Atopy, n (%)	383	307 (84.8)	18	14 (82.4)	0.732
Pneumonia, n (%)	383	30 (7.8)	18	6 (33.3)	0.001
Neu percentage, median (IQR)	305	0.47 (0.40, 0.55)	16	0.44 (0.42, 0.52)	0.809
Eo percentage, median (IQR)	305	0.044 (0.023, 0.066)	16	0.058 (0.028, 0.076)	0.488
FeNO (ppb), median (IQR)	346	14.5 (9.0, 28.0)	16	34.5 (15.2, 42.2)	0.025
Total IgE (KU/L), median (IQR)	294	250 (115.2, 515.5)	16	246.5 (101.6, 302.2)	0.580
FEV1%pred, median (IQR)	378	97.9 (90.2, 106.0)	18	89.7 (86.7, 98.9)	0.027
FVC%pred, median (IQR)	378	96.2 (89.0, 103.2)	18	99.6 (90.5, 106.8)	0.408
FEV1/FVC, median (IQR)	378	87.0 (82.6, 92.0)	18	78.2 (74.2, 83.9)	<0.001
PEF%pred, median (IQR)	378	89.9 (80.6, 99.9)	18	83.8 (79.1, 101.2)	0.487
MMEF%pred, median (IQR)	378	77.4 (66.9, 91.4)	18	60.4 (50.7, 71.0)	<0.001

N1 and N2 represent the number of participants with available data for each variable in the NPAL and PAL groups, respectively.

https://dx.doi.org/10.21037/jtd-23-1796

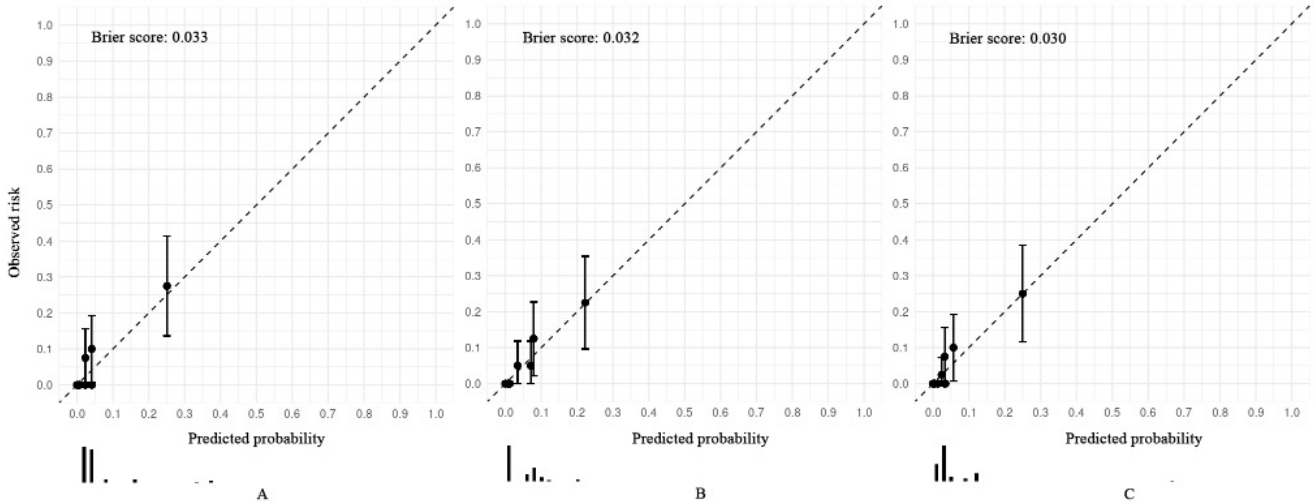

Figure S3 Calibration curves of the three models on the external validation dataset.

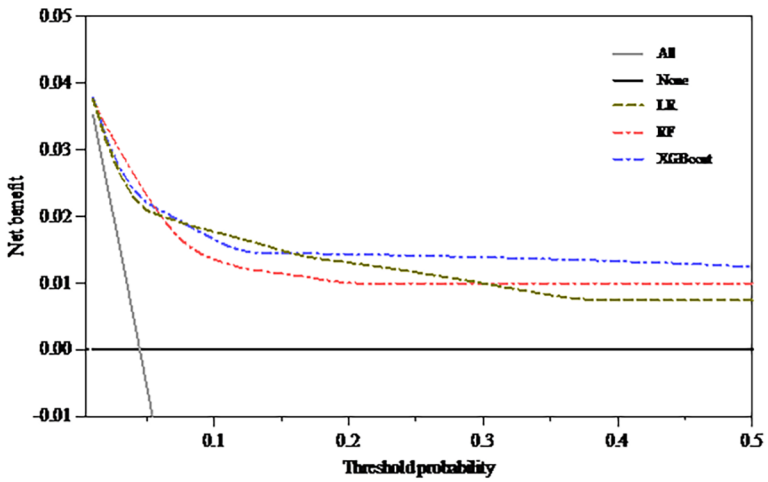

Figure S4 Decision curve analysis of three models on external validation dataset.

https://dx.doi.org/10.21037/jtd-23-1796