**Supplement table 1.**

|  |  |  |  |
| --- | --- | --- | --- |
| Groups | Previous exacerbation history Total ≥2 or Severe ≥1 in the past year?  | Post-FEV1% FEV1 <50%? | SymptommMRC ≥2 or SGRQ ≥ 25? |
| 1 | No | No | No |
| 2 | Yes |
| 3 | Yes | No |
| 4 | Yes |
| 5 | Yes | No | No |
| 6 | Yes |
| 7 | Yes | No |
| 8 | Yes |

FEV1, forced expiratory volume in one second; mMRC, modified Medical Round Council; SGRQ, St. George Respiratory Questionnaire;

**Supplement table 2.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Model | Criteria of symptom group  | Criteria of risk group |  |  | Logistic models | Cox proportional hazard models |
| aOR\* | 95% CI | aHR\* | 95% CI |
| 1. Symptom: mMRC only | mMRC | Exacerbation (Total or severe) or FEV1 | ABCD | 211 (34.5%)136 (22.3%)89 (14.6%)175 (28.6%) | 12.371.762.45 | -1.41-3.990.95-3.261.47-4.08 | 11.821.572.18 | -1.31-2.521.06-2.331.58-3.01 |
| 2. Symptom: SGRQ only | SGRQ | Exacerbation (Total or severe) or FEV1 | ABCD | 169 (27.7%)178 (29.1%)49 (8.0%)215 (35.2%) | 11.471.351.94 | -0.88-2.460.63-2.871.17-3.23 | 11.261.221.79 | -0.91-1.750.74-2.021.30-2.46 |
| 3. Risk: FEV1 only | mMRC or SGRQ | FEV1 | ABCD | 149 (24.4%)252 (41.2%)27 (4.4%)183 (29.9%) | 11.670.791.98 | -1.01-2.780.26-2.371.14-3.42 | 11.430.991.72 | -1.04-1.970.49-2.011.22-2.42 |
| 4. Risk: AE only (GOLD 2017) | mMRC or SGRQ | Exacerbation (Total or severe) | ABCD | 162 (26.5%)340 (55.7%)14 (2.3%)95 (15.6%) | 12.093.712.36 | -1.29-3.391.12-12.281.26-4.43 | 11.663.022.04 | -1.24-2.251.52-5.991.37-3.04 |
| 5. Risk: total AE only | mMRC or SGRQ | Total exacerbation | ABCD | 170 (27.8%)372 (60.9%)6 (1.0%)63 (10.3%) | 11.974.082.19 | -1.24-3.130.75-22.051.09-4.40 | 11.573.472.17 | -1.18-2.101.37-8.741.40-3.36 |
| 6. Risk: severe AE only | mMRC or SGRQ | Severe exacerbation | ABCD | 166 (27.2%)374 (61.2%)11 (1.8%)60 (9.8%) | 11.911.532.15 | -1.20-3.030.36-6.511.06-4.37 | 11.632.151.84 | -1.22-2.170.97-4.771.15-2.93 |
| 7. Risk: FEV1 or total AE (no severe AE criteria) | mMRC or SGRQ | Total exacerbation or FEV1 | ABCD | 145 (23.7%)225 (36.8%)31 (5.1%)210 (34.4%) | 11.881.402.18 | -1.11-3.180.54-3.641.26-3.78 | 11.501.441.88 | -1.08-2.080.78-2.671.34-2.65 |
| 8. Risk: FEV1 or severe AE (no total AE criteria) | mMRC or SGRQ | Severe exacerbation or FEV1 | ABCD | 143 (23.4%)226 (37.0%)33 (5.4%)209 (34.2%) | 11.831.302.18 | -1.07-3.100.50-3.381.26-3.77 | 11.511.471.90 | -1.09-2.110.81-2.671.34-2.68 |
|  |  |  |  |  |  |  |  |  |
| 9. Symptom: mMRC only, Risk: FEV1 only | mMRC | FEV1 | ABCD | 240 (39.3%)161 (26.4%)60 (9.8%)150 (24.6%) | 12.181.322.02 | -1.35-3.510.65-2.651.22-3.34 | 11.731.201.84 | -1.28-2.330.77-1.881.34-2.51 |
| 10. Symptom: mMRC only, Risk: AE only (new proposal) | mMRC | Exacerbation (Total or severe) | ABCD | 262 (42.9%)240 (39.3%)38 (6.2%)71 (11.6%) | 12.051.692.51 | -1.35-3.120.77-3.721.34-4.69 | 11.781.722.34 | -1.36-2.311.07-2.781.56-3.51 |
| 11. Symptom: mMRC only, Risk: total AE only | mMRC | Total exacerbation | ABCD | 278 (45.5%\_264 (43.2%)22 (3.6%)47 (7.7%) | 11.961.382.44 | -1.31-2.930.50-3.871.19-4.99 | 11.651.432.72 | -1.28-2.130.75-2.691.75-4.25 |
| 12. Symptom: mMRC only, Risk: severe AE only | mMRC | Severe exacerbation | ABCD | 280 (45.8%)260 (42.6%)21 (3.4%)50 (8.2%) | 11.981.212.23 | -1.32-2.960.43-3.411.10-4.52 | 11.811.861.85 | -1.41-2.341.05-3.301.13-3.02 |
| 13. Symptom: mMRC only, Risk: FEV1 or total AE (no severe AE criteria) | mMRC | Total exacerbation or FEV1 | ABCD | 224 (36.7%)146 (23.9%)76 (12.4%)165 (27.0%) | 12.121.382.20 | -1.29-3.490.72-2.631.33-3.63 | 11.661.292.03 | -1.22-2.270.86-1.951.48-2.77 |
| 14. Symptom: mMRC only, Risk: FEV1 or severe AE (no total AE criteria) | mMRC | Severe exacerbation or FEV1 | ABCD | 224 (36.7%)145 (23.7%)76 (12.4%)166 (27.2%) | 12.291.572.25 | -1.38-3.790.82-3.001.36-3.72 | 11.861.552.05 | -1.36-2.551.03-2.341.48-2.82 |
|  |  |  |  |  |  |  |  |  |
| 15. Symptom: SGRQ only, Risk: FEV1 only | SGRQ | FEV1 | ABCD | 240 (39.3%)161 (26.4%)60 (9.8%)150 (24.6%) | 12.181.322.02 | -1.35-3.510.65-2.651.22-3.34 | 11.731.201.83 | -1.28-2.330.77-1.881.34-2.51 |
| 16. Symptom: SGRQ only, Risk: AE only | SGRQ | Exacerbation (Total or severe) | ABCD | 180 (29.5%)221 (36.2%)38 (6.2%)172 (28.2%) | 11.330.741.72 | -0.83-2.150.30-1.821.03-2.87 | 11.220.801.61 | -0.90-1.650.44-1.441.17-2.23 |
| 17. Symptom: SGRQ only, Risk: total AE only | SGRQ | Total exacerbation | ABCD | 210 (34.4%)332 (54.3%)8 (1.3%)4 (61%) | 11.571.831.91 | -1.03-2.400.40-8.340.98-3.74 | 11.422.182.05 | -1.09-1.850.87-5.451.34-3.12 |
| 18. Symptom: SGRQ only, Risk: severe AE only | SGRQ | Severe exacerbation | ABCD | 204 (33.4%)336 (55.0%)15 (2.4%)56 (9.2%) | 11.480.712.03 | -0.97-2.260.18-2.741.02-4.04 | 11.421.251.82 | -1.09-1.860.57-2.731.16-2.85 |
| 19. Symptom: SGRQ only, Risk: FEV1 or total AE (no severe AE criteria) | SGRQ | Total exacerbation or FEV1 | ABCD | 175 (28.6%)195 (31.9%)43 (7.0%)198 (32.4%) | 11.391.021.81 | -0.85-2.290.45-2.301.09-3.01 | 11.231.031.72 | -0.89-1.680.60-1.761.25-2.37 |
| 20. Symptom: SGRQ only, Risk: FEV1 or severe AE (no total AE criteria) | SGRQ | Severe exacerbation or FEV1 | ABCD | 172 (28.2%)197 (32.2%)46 (7.5%)196 (32.1%) | 11.330.941.81 | -0.81-2.190.42-2.091.09-3.01 | 11.221.021.73 | -0.89-1.680.60-1.721.25-2.38 |

mMRC, modified Medical Round Council; SGRQ, St. George Respiratory Questionnaire; FEV1, forced expiratory volume in one second

\* adjusted by age, sex, height, weight, smoking status, comorbidities including diabetes, hypertension, cardiac disease and cerebrovascular disease and medication possession ratio of respiratory medications (inhaled corticosteroid-long acting beta agonist and long-acting muscarinic antagonist)

**Supplement table 3.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Model | Criteria ofsymptom group | Criteria ofrisk group | Logistic models*\** | Cox proportional hazard models*\** |
| AIC | BIC | ROC | AIC | BIC | Harrell’s C |
| 1. Symptom: mMRC only | mMRC | Exacerbation (Total or severe) or FEV1 | 691.9 | 757.4 | 0.660 | 3275.1 | 3336.2 | 0.632 |
| 2. Symptom: SGRQ only | SGRQ | Exacerbation (Total or severe) or FEV1 | 700.7 | 766.2 | 0.643 | 3286.5 | 3347.6 | 0.623 |
| 3. Risk: FEV1 only | mMRC or SGRQ | FEV1 | 698.7 | 764.1 | 0.649 | 3288.6 | 3349.7 | 0.625 |
| 4. Risk: AE only (GOLD 2017) | mMRC or SGRQ | Exacerbation (Total or severe) | 694.9 | 760.4 | 0.659 | 3281.1 | 3342.2 | 0.635 |
| 5. Risk: total AE only | mMRC or SGRQ | Total exacerbation | 696.9 | 762.3 | 0.654 | 3282.7 | 3343.8 | 0.633 |
| 6. Risk: severe AE only | mMRC or SGRQ | Severe exacerbation | 698.9 | 764.3 | 0.647 | 3286.8 | 3347.8 | 0.623 |
| 7. Risk: FEV1 or total AE (no severe AE criteria) | mMRC or SGRQ | Total exacerbation or FEV1 | 698.6 | 764.0 | 0.648 | 3286.5 | 3347.5 | 0.625 |
| 8. Risk: FEV1 or severe AE (no total AE criteria) | mMRC or SGRQ | Severe exacerbation or FEV1 | 698.6 | 764.0 | 0.647 | 3286.4 | 3347.5 | 0.623 |
|  |  |  |  |  |  |  |  |  |
| 9. Symptom: mMRC only, Risk: FEV1 only | mMRC | FEV1 | 694.4 | 759.8 | 0.656 | 3280.3 | 3341.4 | 0.626 |
| 10. Symptom: mMRC only, Risk: AE only (new proposal) | mMRC | Exacerbation (Total or severe) | 693.0 | 758.4 | 0.660 | 3274.7 | 3335.8 | 0.636 |
| 11. Symptom: mMRC only, Risk: total AE only | mMRC | Total exacerbation | 694.3 | 759.8 | 0.657 | 3275.3 | 3336.3 | 0.633 |
| 12. Symptom: mMRC only, Risk: severe AE only | mMRC | Severe exacerbation | 694.7 | 760.1 | 0.656 | 3276.9 | 3337.9 | 0.630 |
| 13. Symptom: mMRC only, Risk: FEV1 or total AE (no severe AE criteria) | mMRC | Total exacerbation or FEV1 | 694.2 | 759.6 | 0.656 | 3278.2 | 3339.3 | 0.629 |
| 14. Symptom: mMRC only, Risk: FEV1 or severe AE (no total AE criteria) | mMRC | Severe exacerbation or FEV1 | 693.2 | 758.7 | 0.657 | 3276.6 | 3337.6 | 0.630 |
|  |  |  |  |  |  |  |  |  |
| 15. Symptom: SGRQ only, Risk: FEV1 only | SGRQ | FEV1 | 694.4 | 759.8 | 0.656 | 3280.3 | 3341.4 | 0.626 |
| 16. Symptom: SGRQ only, Risk: AE only | SGRQ | Exacerbation (Total or severe) | 700.1 | 766.4 | 0.643 | 3288.1 | 3349.2 | 0.626 |
| 17. Symptom: SGRQ only, Risk: total AE only | SGRQ | Total exacerbation | 701.7 | 767.1 | 0.642 | 3286.9 | 3348.0 | 0.627 |
| 18. Symptom: SGRQ only, Risk: severe AE only | SGRQ | Severe exacerbation | 701.3 | 766.7 | 0.639 | 3290.7 | 3351.8 | 0.619 |
| 19. Symptom: SGRQ only, Risk: FEV1 or total AE (no severe AE criteria) | SGRQ | Total exacerbation or FEV1 | 701.4 | 766.8 | 0.642 | 3287.1 | 3348.2 | 0.624 |
| 20. Symptom: SGRQ only, Risk: FEV1 or severe AE (no total AE criteria) | SGRQ | Severe exacerbation or FEV1 | 700.9 | 766.3 | 0.642 | 3287.0 | 3348.1 | 0.625 |

AIC, Akaike information criteria; BIC, Bayesian information criteria; AUROC, area under receiver operating curve; mMRC, modified Medical Round Council; SGRQ, St. George Respiratory Questionnaire; FEV1, forced expiratory volume in one second

\* adjusted by age, sex, height, weight, smoking status, comorbidities including diabetes, hypertension, cardiac disease and cerebrovascular disease and medication possession ratio of respiratory medications (inhaled corticosteroid-long acting beta agonist and long-acting muscarinic antagonist)