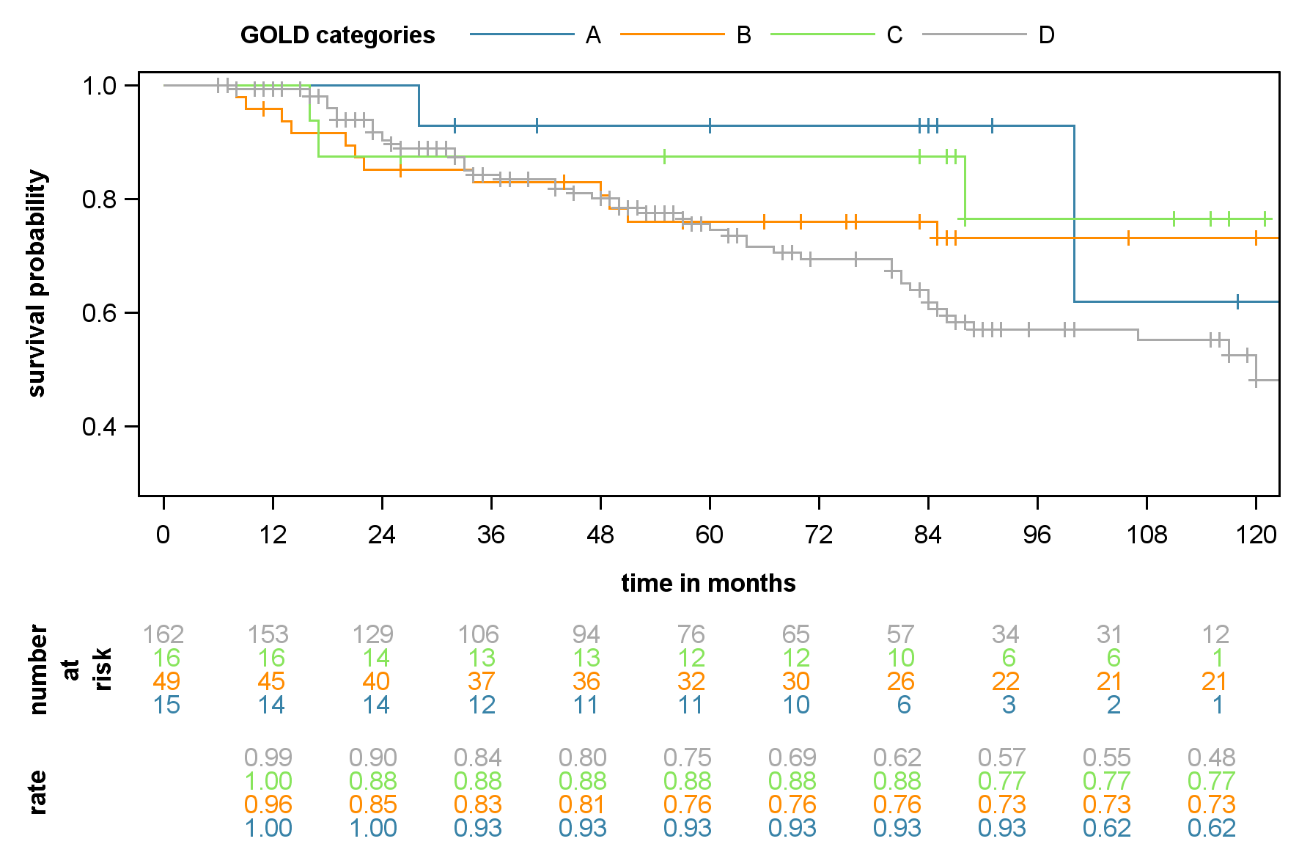
# Supplementary material

**Value of cardiopulmonary exercise testing in the prognosis assessment of COPD patients** **– a retrospective, multicentre cohort study**

Ralf Ewert, Anne Obst, Andreas Mühle, Michael Halank, Jörg Winkler, Bernd Trümper, Gerhard Hoheisel, Andreas Hoheisel, Mark Wiersbitzky, Alexander Heine, Alexander Maiwald, Sven Gläser, Beate Stubbe

# Supplementary figures



***Figure S1*: All-cause mortality according to GOLD categories**

GOLD=Global Initiative for Chronic Obstructive Lung Disease.





***Figure S2*: VO2peak (mL/kg/min) for discrimination of survival at 1 year**

In receiver operating characteristic analysis (upper panel), VO2peak=14.3 mL/kg/min was identified as the optimal threshold for prediction of survival at 1 year. Survival in patients with VO2peak <14.3 mL/kg/min and ≥14.3 mL/kg/min is shown in a Kaplan–Meier plot (lower panel). AUC=area under the curve (reported with 95% confidence interval). VO2peak=peak oxygen uptake.





***Figure S3*: VO2peak (% predicted) for discrimination of survival at 1 year**

In receiver operating characteristic analysis (upper panel), VO2peak=44% predicted was identified as the optimal threshold for prediction of survival at 1 year. Survival in patients with VO2peak <44% predicted and ≥44% predicted is shown in a Kaplan–Meier plot (lower panel). AUC=area under the curve (reported with 95% confidence interval). VO2peak=peak oxygen uptake.





***Figure S4*: VO2peak (mL/kg/min) for discrimination of prognosis at 3 years**

In receiver operating characteristic analysis (upper panel), VO2peak=14.3 mL/kg/min was identified as the optimal threshold for prediction of survival at 3 years. Survival in patients with VO2peak <14.3 mL/kg/min and ≥14.3 mL/kg/min is shown in a Kaplan–Meier plot (lower panel). AUC=area under the curve (reported with 95% confidence interval). VO2peak=peak oxygen uptake.



***Figure S5*: VO2peak (% predicted) for discrimination of prognosis at 3 years**

In receiver operating characteristic analysis (upper panel), VO2peak=56% predicted was identified as the optimal threshold for prediction of survival at 3 years. Survival in patients with VO2peak <56% predicted and ≥56% predicted is shown in a Kaplan–Meier plot (lower panel). AUC=area under the curve (reported with 95% confidence interval). VO2peak=peak oxygen uptake.

# Supplementary table

***Table S1*: Calculation of reference values for cardiopulmonary exercise test parameters1**

| **Parameter** | **Calculation** |
| --- | --- |
| Maximum power |  |
| Female | −80·628−0·7698\*age[years]+1·4038\*height[cm]+0·2873\*weight[kg] |
| Male | −103·512−1·5576\*age[years]+2·2114\*height[cm]−0·1198\*weight[kg] |
| VO2peak |  |
| Female | −54·739−9·8085\*age[years]−2·9840\*height[cm]+4·3668\*weight[kg] |
| Male | 29·509−0·5930\*age[years]+3·1646\* height[cm]+3·9946\*weight[kg] |
| VO2@AT |  |
| Female | 298·823−1·5512\*age[years]+2·3848\*height[cm]+4·7977\*weight[kg] |
| Male | 329·082−4·9426\*age[years]+4·3686\*height[cm]+5·4209\*weight[kg] |
| VÉpeak |  |
| Female | −1·896−0·2959\*age[years]+0·3516\*height[cm]+0·1876\*weight[kg] |
| Male | 13·148−0·5809\*age[years]+0·4103\*height[cm]+0·2887\*weight[kg] |
| VO2peak/HRpeak |  |
| Female | −1·720−0·0008\*age[years]+0·0512\*height[cm]+0·0547\*weight[kg] |
| Male | 1·475−0·0613\*age[years]+0·0621\*height[cm]+0·0724\*weight[kg] |

HRpeak=peak heart rate. VÉpeak=peak ventilation. VO2@AT=oxygen uptake at anaerobic threshold. VO2peak=peak oxygen uptake.

# Supplementary reference

1. Glaser S, Ittermann T, Schaper C, et al. [The Study of Health in Pomerania (SHIP) reference values for cardiopulmonary exercise testing]. *Pneumologie* 2013; **67**: 58-63.