

## Diagnostic accuracy of a screening predicting long term RTW problems in patients with neurological diseases

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## Background

- Effective elements of return-to-work (RTW) interventions for patients with neurological diseases
  - combination of clinical and workplace intervention
  - work orientation at an early stage of rehabilitation
  - case coordination
  
- Work-related medical rehabilitation (WMR) in Germany
  - intensified, focused on working conditions of the person
  - oriented on the concept of working performance (Graded Activity, work adaptation...)
  
- Not all patients need the same intensity of rehabilitation for RTW!
  - Crucial element: Early identification of patients that will have severe problems in the short and long term concerning RTW
  - A screening instrument could provide this

## SIMBO – a generic screening

- weighted sum of seven single items
- total score ranges from 0 to 100 points
- higher values indicate an increased risk of non-RTW in the future
- Recommended threshold: 27 pts

age < 46 years → weight: 7

unemployed → weight: 16

on sick leave → weight: 29

sick leave >26 weeks → weight: 13

work disability >7 → weight: 8

not able to work → weight: 20

motivation >3 → weight: 7

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## SIMBO – valid for several illnesses

Prediction of RTW after rehabilitation (3 month follow-up)

	N	Sens	Spec	PPV	NPV	Youden
<b>Total (weighted)</b>	<b>2050</b>	<b>86.5%</b>	<b>84.1%</b>	<b>63.5%</b>	<b>94.0%</b>	<b>0.705</b>
Musculoskeletal D	151	87.5%	88.4%	77.8%	93.8%	0.759
<b>Mental D</b>	250	87.1%	79.9%	78.9%	87.7%	0.669
Neoplasms	184	88.6%	80.7%	73.8%	92.0%	0.693
Endocrine and metabolic D	441	81.2%	85.6%	62.6%	93.9%	0.668
Circulatory system	343	60.6%	91.3%	42.6%	95.6%	0.519
Respiratory system	470	84.4%	79.5%	49.4%	95.6%	0.639
Digestive system	83	92.6%	80.4%	69.4%	95.7%	0.730
Other D	128	79.2%	81.7%	50.0%	94.4%	0.609

Notes: Cut-off: ≥27 pts.; Sens – sensitivity, Spec – specificity, PPV – positive predictive value, NPV – negative predictive value; Total weighted for distribution of rehab interventions of the GFPI 2013

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## Study aim and methods

### Aim

- Diagnostic accuracy of the SIMBO for neurological diseases in the long term

### Design

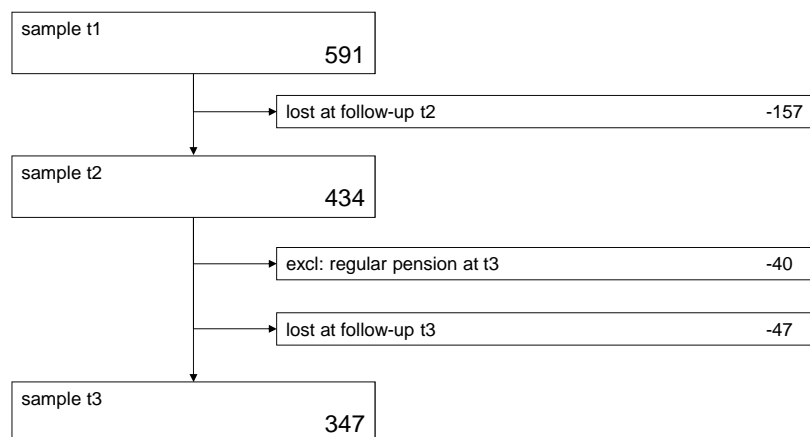
- Prospective multicentre cohort study
- SIMBO at admission (t1), outcome measures 3 months (t2) and ~21 months after rehabilitation (t3)
- Inclusion criteria: Patients with neurological diseases, 18 to 65 years

### Primary outcome

- Failed stable occupational participation after rehabilitation
  - not returned to work at follow-up OR
  - returned to work at follow-up, but at least 6 weeks of sick leave in the 3 months follow-up and 6 months of sick leave in the 21 months follow-up, resp.

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## Sample – flow chart



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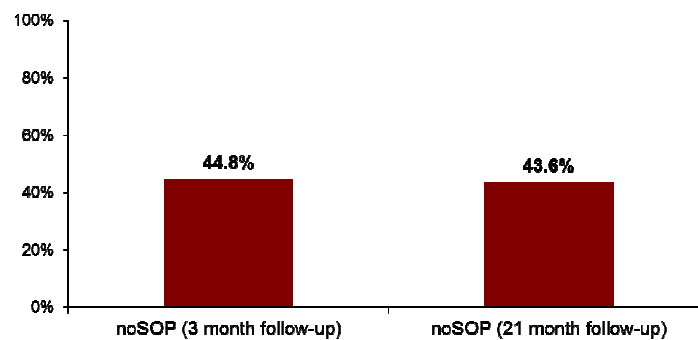
## Sample description

	<i>n</i>	<i>aM ± s / %</i>
Age (years)	347	49.2 ± 8.8
Women (%)	347	57.1
Duration of rehabilitation (days)	347	34.1 ± 7.9
Most frequent disease group (%)	347	
<i>Cerebrovascular diseases</i>		26.5
<i>Multiple Sclerosis</i>		33.4
Work Ability Score (1-10)	346	4.8 ± 2.5
<hr/>		
SIMBO (0-100)	346	28.6 ± 24.8
SIMBO (Cut-Off: 27 points, %)	346	50.3

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## Primary outcome

### Failed stable occupational participation (noSOP)



**Nearly half of the patients didn't go back to work successfully!**

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## Results

### Association of the SIMBO scale and the primary outcome

<i>SIMBO scale</i>	<i>mean ± s</i>	<i>Effect size (Cohens d)</i>	<i>AUC (95% CI)</i>
<b>3 month follow-up</b>			
Patients with SOP	15.3 ± 17.0	1.19 !	.842 (.798, .878)
Patients with no SOP	45.0 ± 23.1		
<b>21 month follow-up</b>			
Patients with SOP	17.8 ± 19.9	0.99 !	.784 (.735, .826)
Patients with no SOP	42.4 ± 23.8		

**There is a close association between the SIMBO scale and the short and long term RTW!**

n = 345 (t2) / 341 (t3), all result p<.05

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## Results

### Diagnostic accuracy of the SIMBO

<i>SIMBO (Cutoff: 27 points)</i>	<i>3 month follow-up</i>	<i>21 month follow-up</i>
Sensitivity (%; CI95)	<b>77.3</b> (70.0; 83.2)	<b>74.3</b> (66.7; 80.7)
Specificity (%; CI95)	71.7 (65.0; 77.6)	68.4 (61.5; 74.5)
Positive predictive value (%; CI95)	<b>68.8</b> (61.5; 75.2)	<b>64.3</b> (56.9; 71.1)
Negative predictive value (%; CI95)	79.7 (73.0; 85.0)	77.7 (70.8; 83.3)

**75% of all patients were predicted correctly concerning their short and long term RTW due to the SIMBO!**

n = 345 (t2) / 341 (t3)

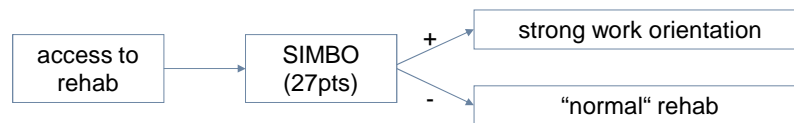
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## Conclusion

→ Study underlines the diagnostic accuracy of the SIMBO-C concerning short and long term RTW problems

→ SIMBO

- a very short, self-rated classification tool that is both generic and able to identify the individual risk of further work disability



→ Further research: Validity of the SIMBO in other rehab systems?

# Thanks!

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