

Continuous vital sign monitoring

during admission for acute exacerbation of chronic obstructive pulmonary disease

– Quantification of micro events

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WARD organization

Wireless Assessment of Respiratory and Circulatory Distress

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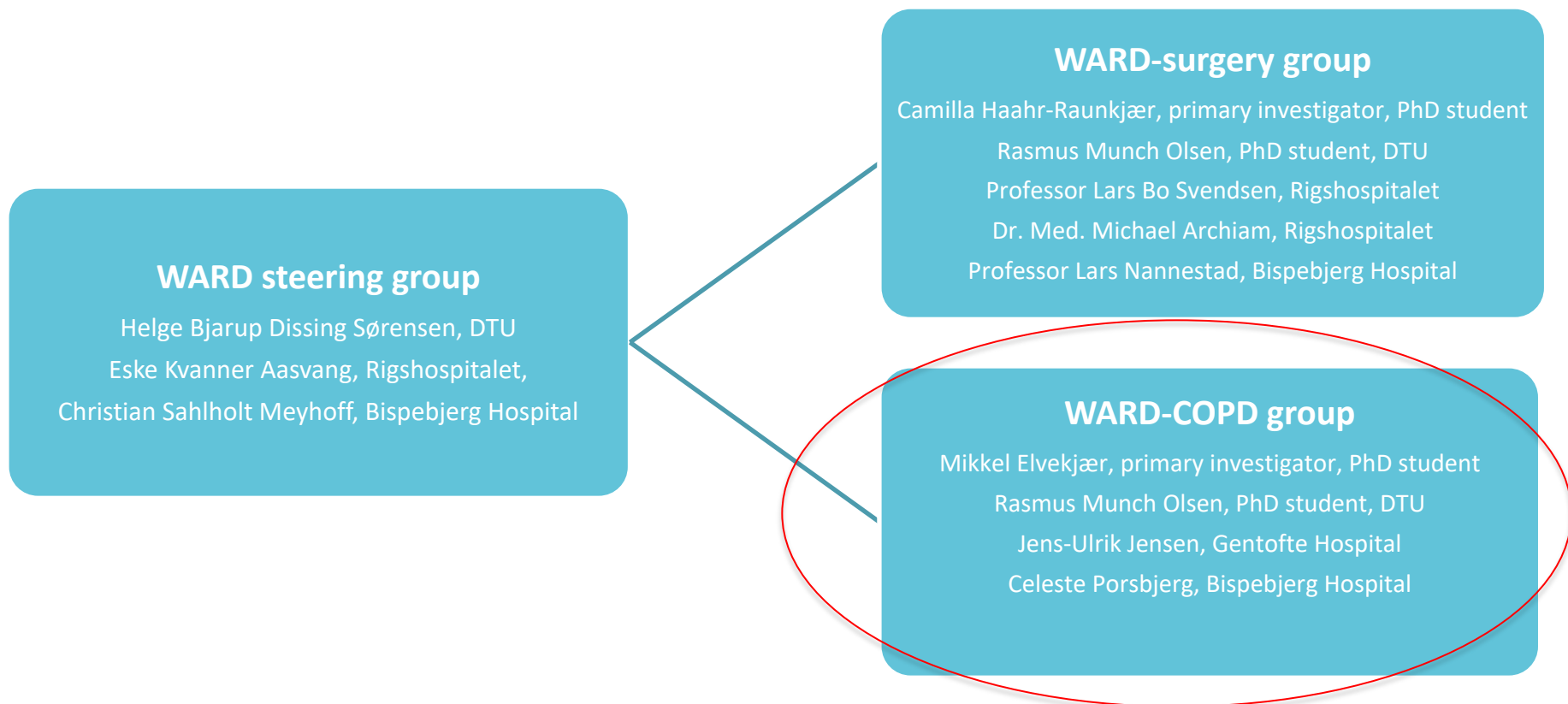
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Wireless Assessment of Respiratory and Circulatory Distress



Background

- COPD is the most frequent cause of admission to a medical ward in Denmark and the third leading cause of death worldwide
- Hospitalized patients clinical condition may suddenly deteriorate
- Adverse trends in routine observations can be overlooked or misinterpreted
- New wearable 24/7 clinical monitoring systems may identify clinical deterioration early

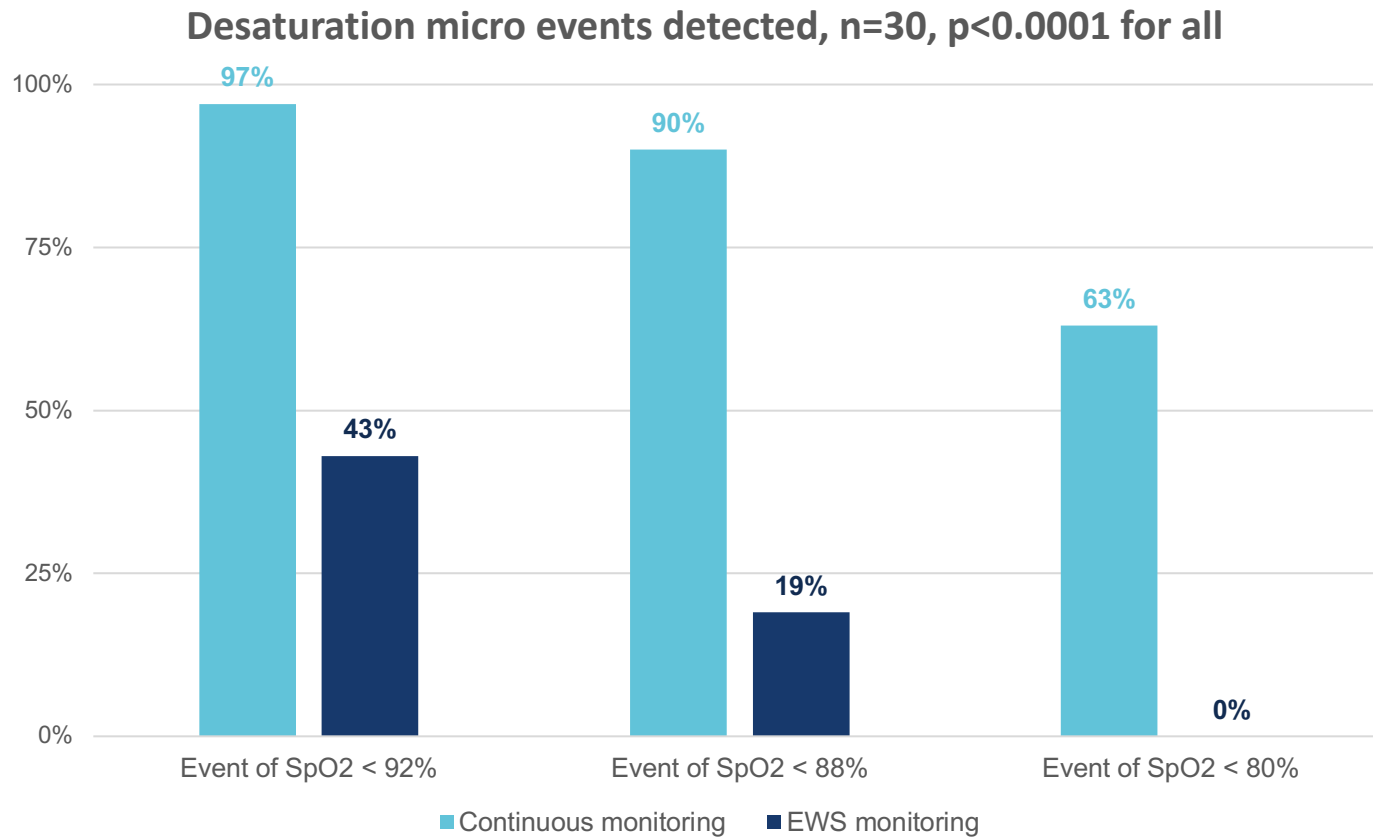
Methods

- Prospective observational pilot study
- 30 patients admitted with AECOPD
- 4 days of continuous vital sign monitoring
 - SpO₂, HR, RR and BP (not visible for clinical staff)
- EWS monitoring as usual

Quantification of micro events: Single parameter EWS score = 3

SpO ₂	<92%, <88%, <80%	
HR	<41 bpm	>130 bpm
RR	<9 bpm	>24 bpm
sBP	<90 mmHg	>220 mmHg

Results



Results

Other cardiopulmonary micro events during admission for acute exacerbation of COPD

	Continuous monitoring, n=30	EWS monitoring, n=30	p-value
Heart rate >130/min	15 (50%)	4 (13%)	0.005
Respiratory rate >24/min	18 (60%)	7 (23%)	0.008
Respiratory rate <9/min	18 (60%)	0	<0.0001
Systolic blood pressure < 90 mmHg	7 (23%)	2 (7%)	0.15

Conclusion

- During hospitalization for AECOPD, severe desaturation and other cardiopulmonary micro events are common and often not detected by EWS
- The clinical impact of these findings has yet to be determined

Thanks!

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Project phases WARD-COPD

1 Pilot study, feasibility
of core-data collection

2 Observational study,
algorithm development

3 RCT, algorithm-based
wireless monitoring vs
standard monitoring

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Validation
studies

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Out-of-hospital

Results

Desaturation micro events during admission for acute exacerbation of COPD

	Continuous monitoring, n=30	EWS monitoring, n=30	p-value
SpO₂ <92%			
Number of patients	29 (97%)	13 (43%)	<0.0001
Duration, minutes	996 [99-3119]	0 [0-2066]	<0.0001
SpO₂ <88%			
Number of patients	27 (90%)	4 (13%)	<0.0001
Duration, minutes	156 [0-1237]	0 [0-165]	<0.0001
SpO₂ <80%			
Number of patients	19 (63%)	0	<0.0001
Duration, minutes	3 [0-79]	0	<0.0001

Values are number (percentage) or median [5%-95% range]. Duration of each event is calculated as median of the cumulative duration among all included patients.