Measuring severity in OSA

The arguments for collaboratively developing a multidimensional score

Introduction

Respiratory disorders are complex and heterogeneous

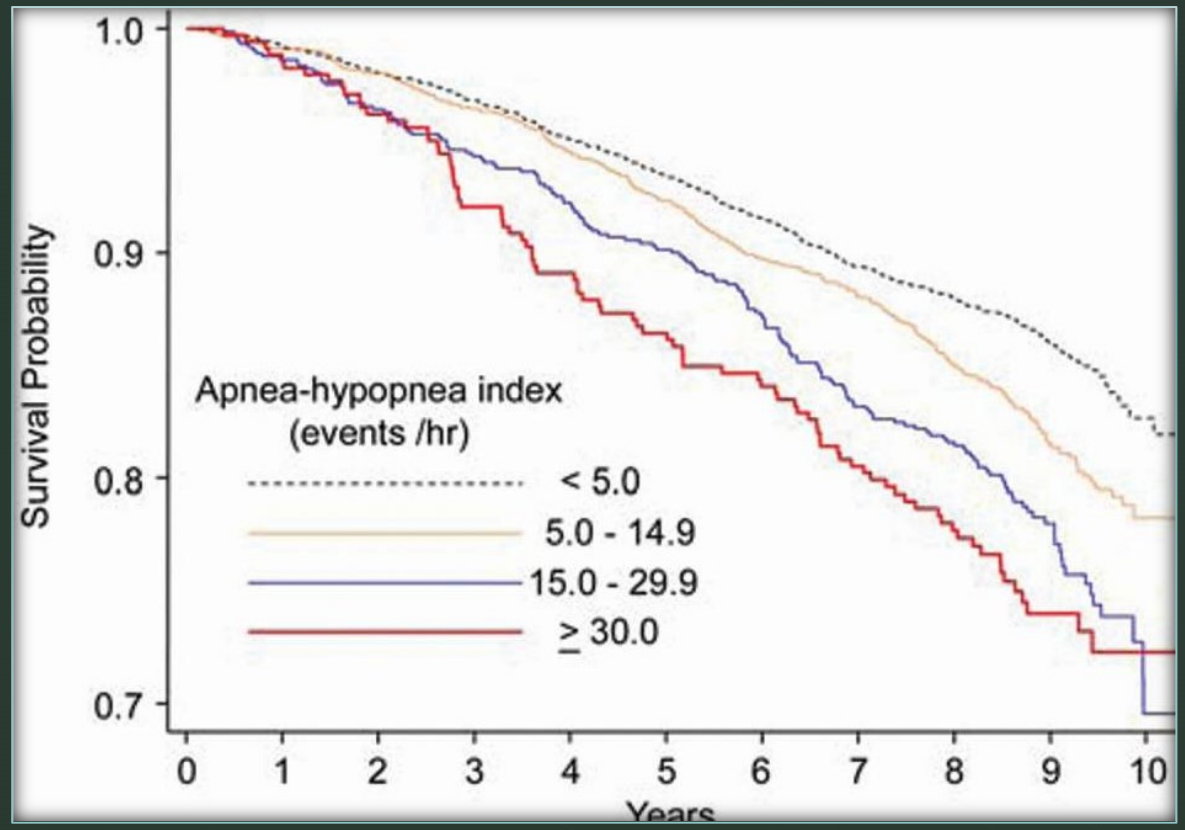
Severity of the disease and impact on the patient’s quality of life or prognosis cannot be readily evaluated via quantitation of a single measure.

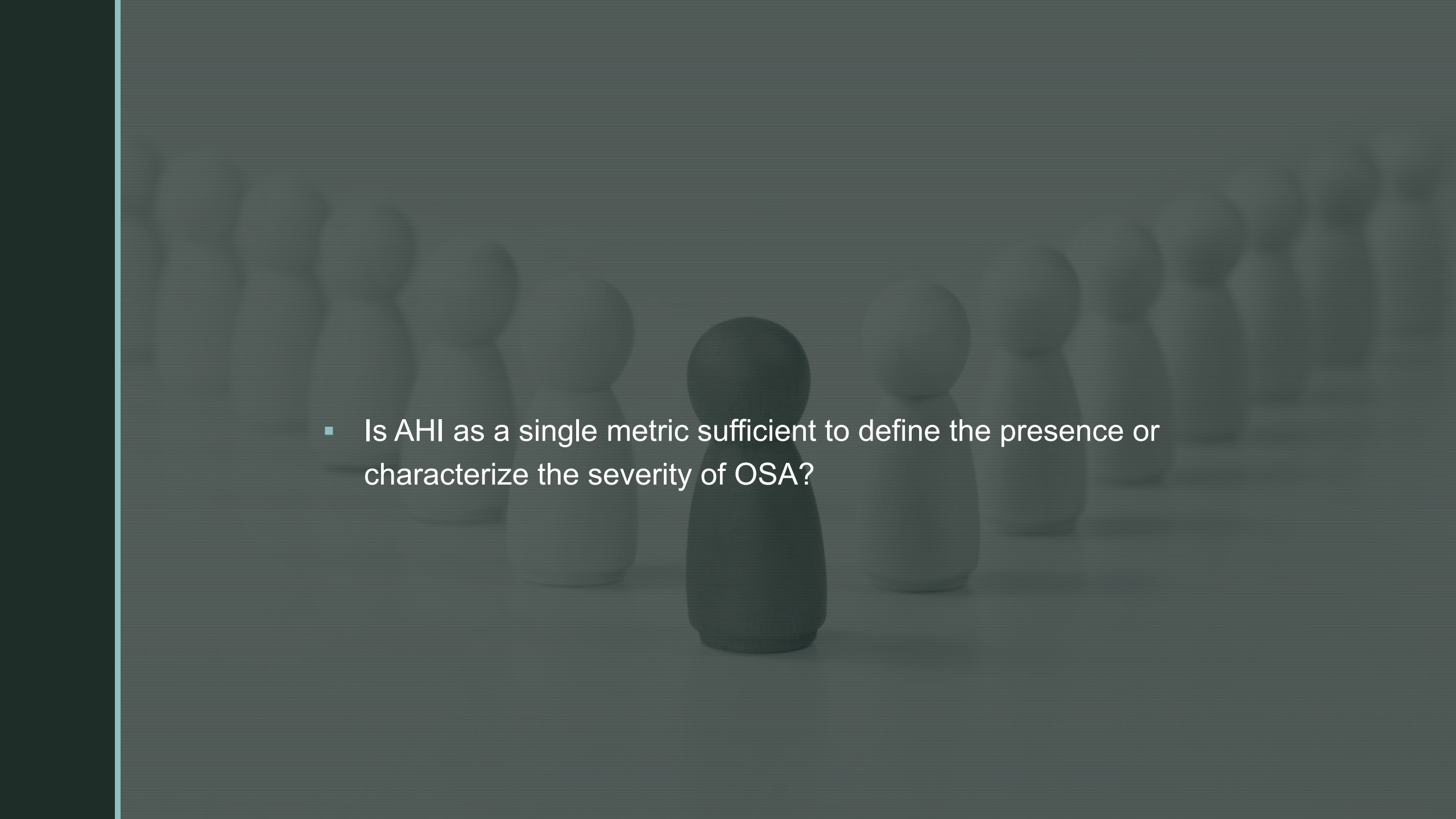
Current State of OSA Evaluation

Apnea-hypopnea index (AHI) remains the single metric that serves as both the diagnostic criterion for OSA as well as the estimate of its severity.

OSA is a very complex disease that exhibits a remarkably heterogeneous clinical presentation.

- AHI - gold standard metric of OSA severity





- Is AHI as a single metric sufficient to define the presence or characterize the severity of OSA?

Limitations of AHI

Multidimensional, validated, and pragmatically valuable score for the appraisal of OSA severity and complexity are lacking…

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Editorial

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Hypoxia not AHI in adults with sleep apnea midlife markedly increases risk of late-onset epilepsy—Carosella CM et al Sleep apnea, hypoxia, and late-onset epilepsy: the Atherosclerosis Risk in Communities study SLEEP-2023-0175.R1

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Importance of Multidimensional Scores

Several key variables whose cumulative scores enable accurate estimates of the disease severity.

Examples:

BODE, PESI, FACED, BSI, PSI

Composite scores

	Factor and points for scoring system	
FEV_1 % predicted	<50 (2 points)	≥50 (0 points)
Age (years)	≤70 (0 points)	>70 (2 points)
Colonisation by *P. aeruginosa*	No (0 points)	Yes (1 point)
Radiological extension of bronchiectasis	1–2 lobes (0 points)	>2 lobes (1 point)
Modified MRC Dyspnoea Scale	1–2 (0 points)	III–IV (1 point)

0–2 Points=mild disease; 3–4=moderate disease; 5–7=severe disease.
FACED, score FEV1, Age, Chronic colonisation, Extension, Dyspnoea: MRC, Medical Research Council.

Variables involved in calculating severity in the FACED score

PE-Severity Index (PESI) SCORE

Characteristics		Points Assigned	Patient Points
Age	.....	Score in years	.....
Male	.....	+10	.....
Cancer Present	.....	+30	.....
Heart Failure	.....	+10	.....
COAD	.....	+10	.....
Pulse Rate >109	.....	**+20**	.....
Systolic Blood Pressure <100	.....	**+30**	.....
Respiratory Rate >30/min	.....	**+20**	.....
Arterial Oxygen Saturation On Air (%) <90%	.....	**+20**	.....
Temperature (Celsius) <36°C *(use mercury thermometer)*	.....	+20	.....
* Altered Mental State	.....	+60	.....

* (Disorientation, lethargy, stupor, coma)

Cardiorespiratory parametres in bold

PATIENT SCORE =

Severity Index:
The PESI score predicts 30-day all cause mortality as follows:

Risk Class I (PESI < 66) =	0.8%
Risk Class II (PESI 66 – 85) =	2.5%
Risk Class III (PESI 86 – 105) =	4.3%
Risk Class IV (PESI 106 – 125) =	9.9%
Risk Class V (PESI >125) =	27.1%

N.B. All existing scoring systems (PESI included) have been developed from databases therefore pertain to patients with PE that have been treated and do not give risk of death in case of no treatment.

Signature of Clinician Dealing With Episode **Date & Time (24h clock)**

....

FEV1 (% predicted)	65% or more
6-min walk distance	350 m (383 yds) or more
BMI	>21
mMRC Dyspnea Scale	0 or 1 point

1 Dyspnea only when strenuously exercising, such as when walking up a slight hill or when in a hurry.

Results

BODE Index score 0

Estimated 4-year survival of this patient: 80%.

Benefits of a Multidimensional Score

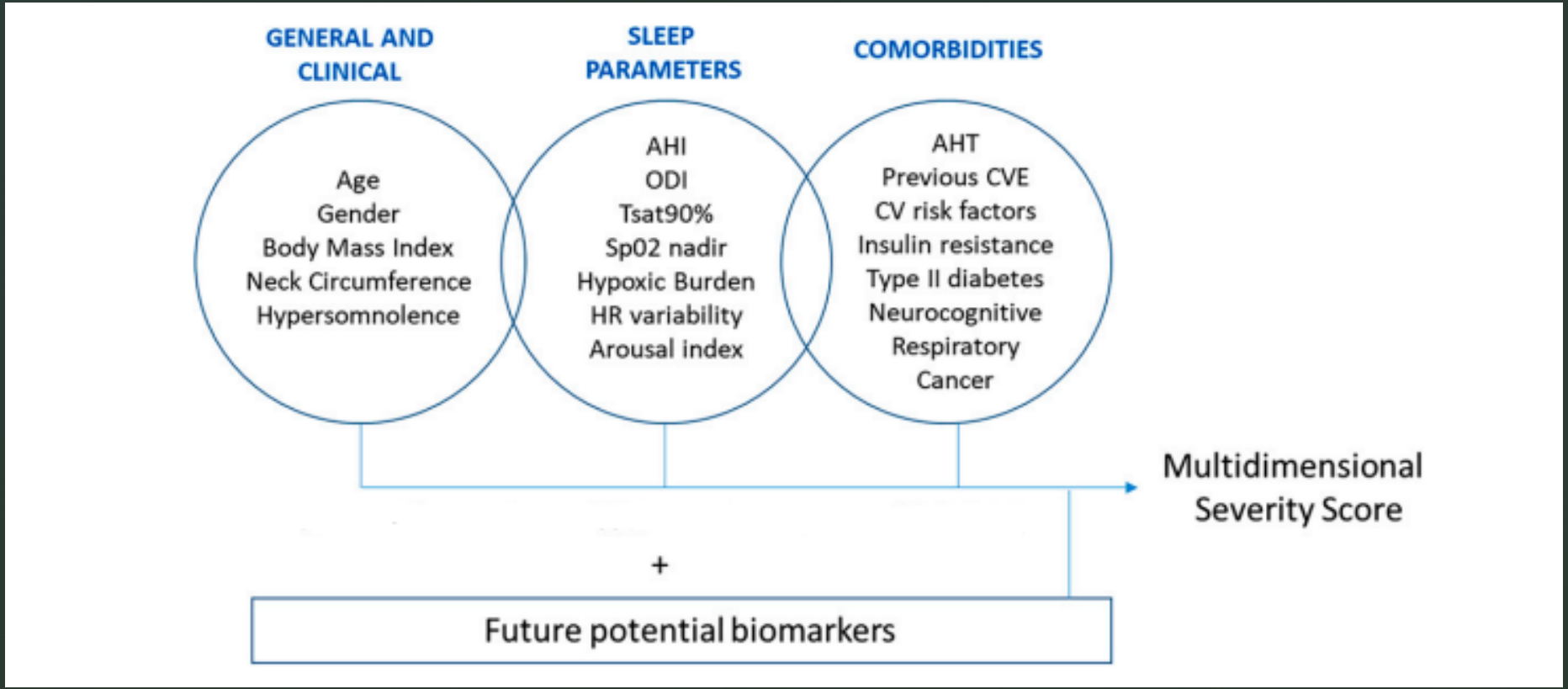
Improved prognostic value

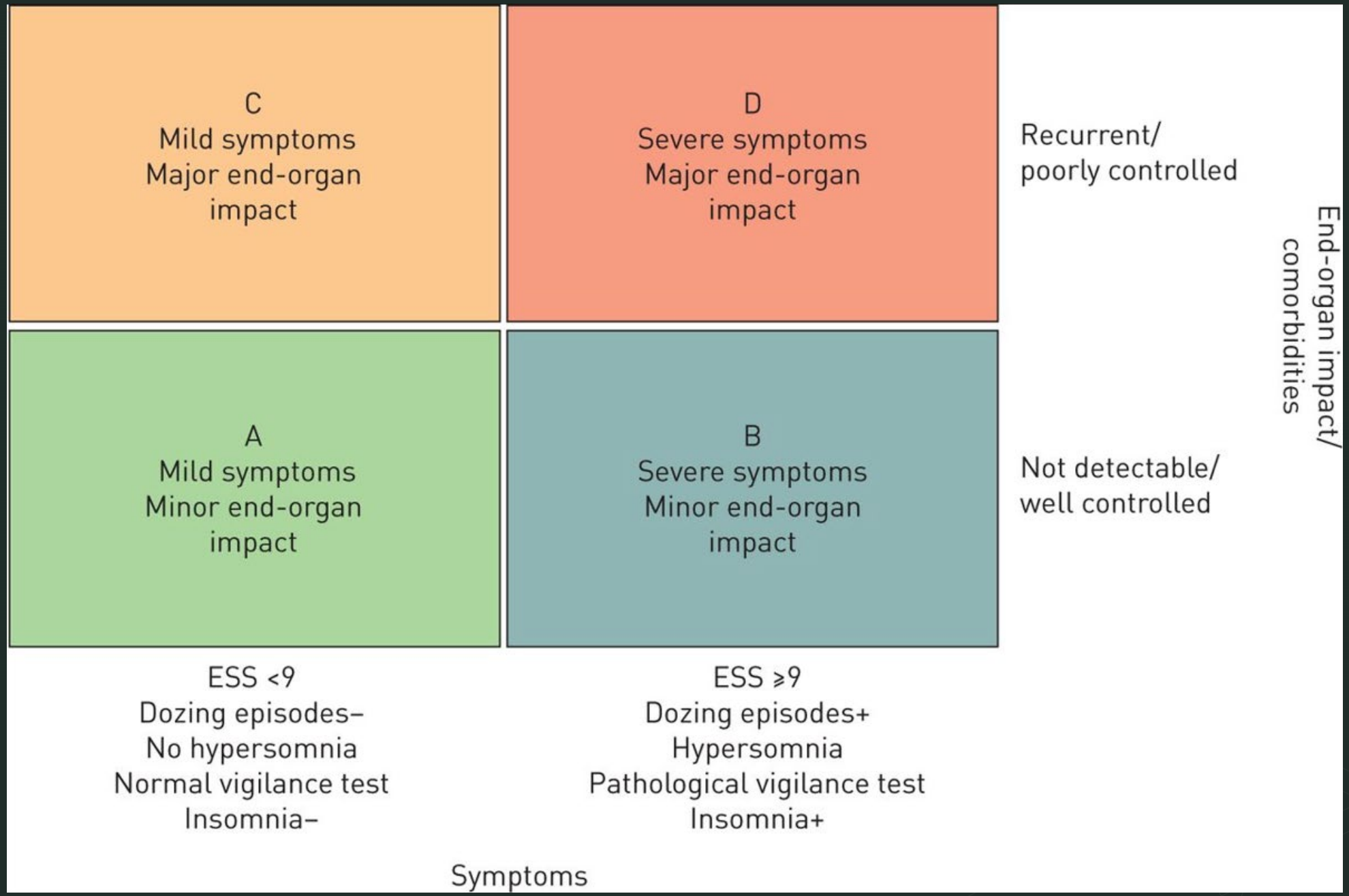
Potential for improving outcomes

Variables for a Multidimensional Score

- readily available
- easily measurable and quantifiable
- easy integration into clinical practice

Multidimensional Score




C
Mild symptoms
Major end-organ impact
D
Severe symptoms
Major end-organ impact
A
Mild symptoms
Minor end-organ impact
B
Severe symptoms
Minor end-organ impact
Recurrent/ poorly controlled
Not detectable/ well controlled
End-organ impact/ comorbidities
ESS <9
Dozing episodes–
No hypersomnia
Normal vigilance test
Insomnia–
ESS ≥9
Dozing episodes+
Hypersomnia
Pathological vigilance test
Insomnia+
Symptoms

Conclusion

Consider outcomes beyond AHI

Multi-dimensional score that improve upon the AHI for the severity classification of OSA will be particularly transformative.

Future Directions

- Large number of databases are prerequisites for developing a uniquely valuable OSA score.

Questions?