

# Using Oxygen Desaturation Index to Predict Respiratory Depression in Post-Surgical Patients Receiving Opioids: A Post-hoc Analysis from the Prediction of Opioid-induced respiratory Depression in patients monitored by capnoGraphY (PRODIGY) study

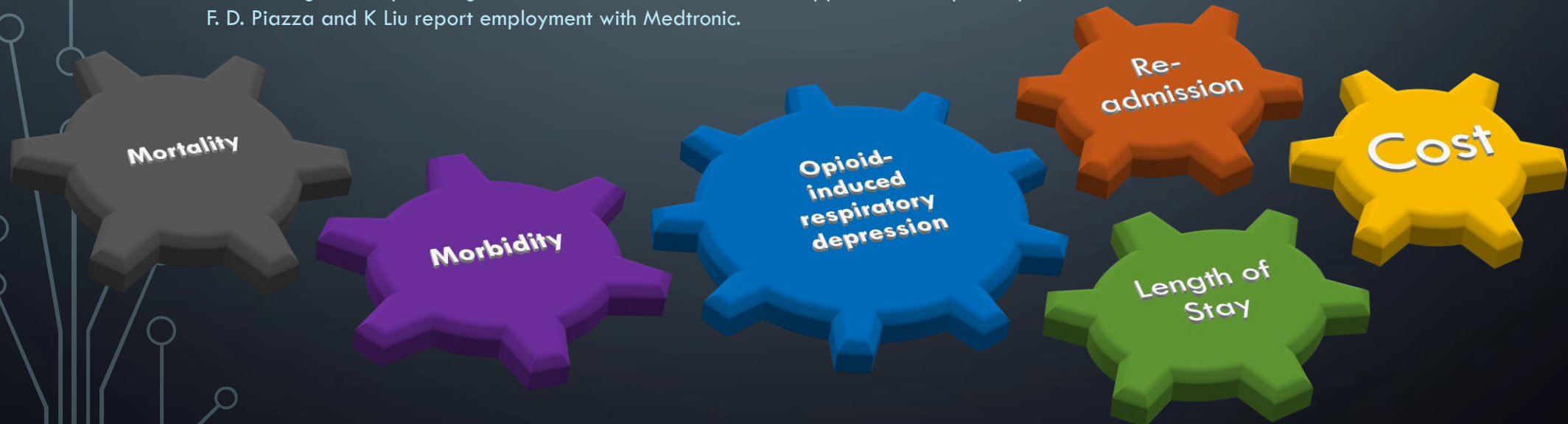
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## Disclosure

A. K. Khanna reports consulting fees from Medtronic, Edwards Lifesciences, and Philips North America.

T. N. Weingarten reports a grant from Merck and nonfinancial support from Respiratory Motion.

F. D. Piazza and K Liu report employment with Medtronic.



# Methods: The PRODIGY trial (NCT02811302)

- Inclusion Criteria: adults receiving parenteral opioid therapy on the general care floor

Any respiratory opioid-related adverse event

Oxygen saturation ( $SpO_2$ )  $\leq 85\%$  for  $\geq 3$  minutes

End-tidal carbon dioxide ( $EtCO_2$ )  $\leq 15$  or  $\geq 60$  mmHg for  $\geq 3$  minutes

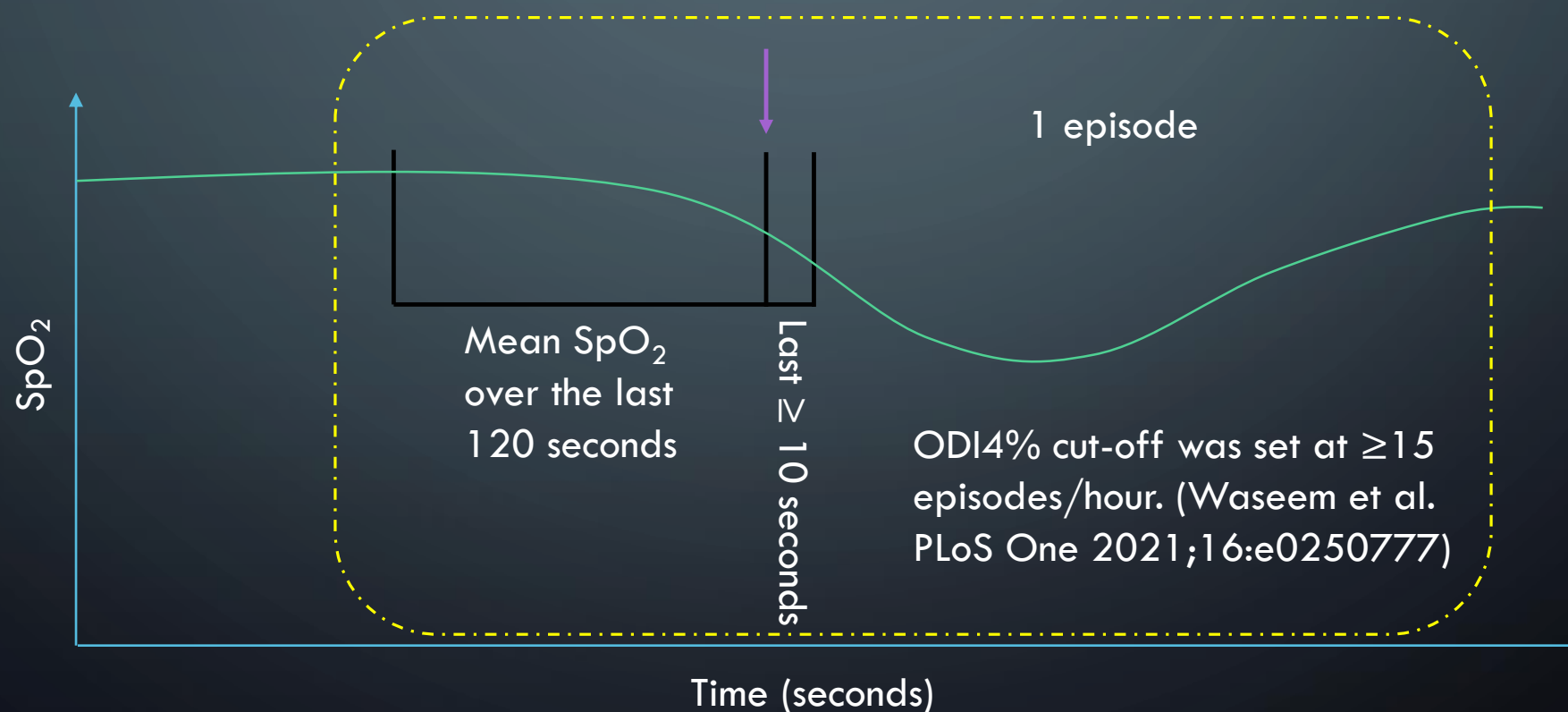
Respiratory rate  $\leq 5$  breaths/min for  $\geq 3$  minutes

Apnea episode lasting  $> 30$  seconds



# Methods

- Oxygen Desaturation Index 4% (ODI4%):
  - 4% decrease in saturation from the average blood oxygen saturation in the past 120 seconds, lasting at least 10 seconds (Chung et al. Anesth Analg 2012;114:993-1000)

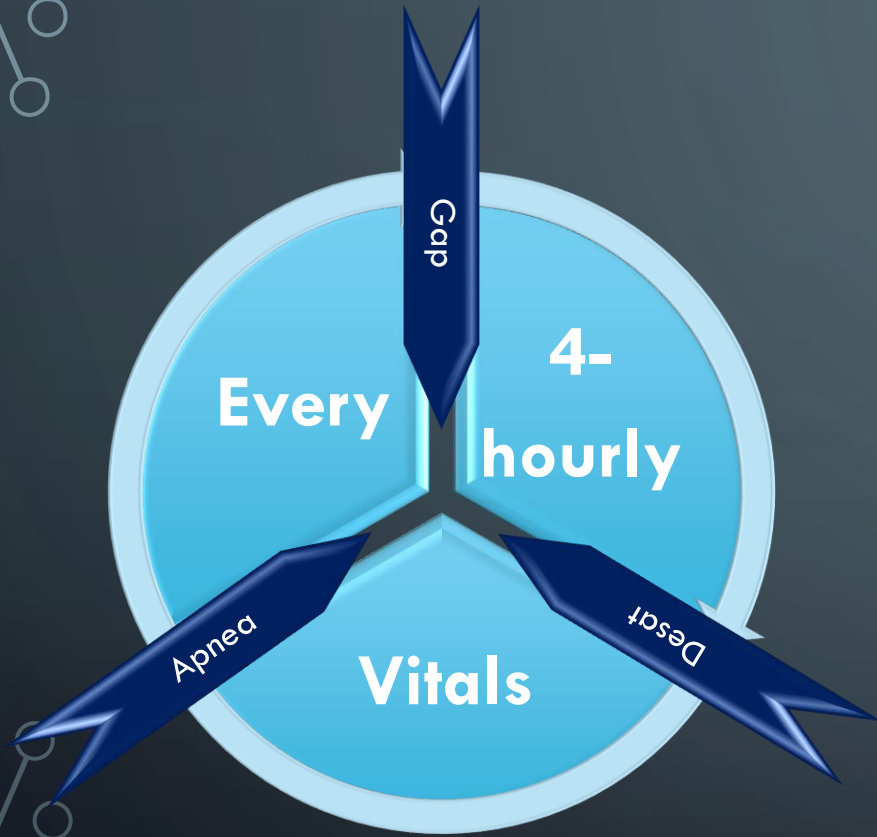


817 / 1072 (76%)  $\geq 1$  episode of ODI<sub>4</sub>%

Parameter	Odds Ratio	95% Wald CI		p-value
		Lower CI	Upper CI	
Length of monitoring (overnight hours)	1.231	1.08	1.403	0.0018
Geography (United States vs Asia)	1.659	1.18	2.333	0.0036
Geography (United States vs Europe)	1.11	0.761	1.621	0.5875
Opioid Naive	1.421	0.988	2.043	0.058
Age ( $\geq 60$ to $< 70$ vs $< 60$ )	2.311	1.694	3.151	$< 0.0001$
Age ( $\geq 70$ to $< 80$ vs $< 60$ )	3.844	2.605	5.673	$< 0.0001$
Age ( $\geq 80$ vs $< 60$ )	6.386	2.801	14.562	$< 0.0001$
Male Sex	2.095	1.593	2.753	$< 0.0001$
Sleep Disordered Breathing	1.531	0.994	2.36	0.0535
Chronic Heart Failure	1.823	0.762	4.359	0.1771
ODI <sub>4</sub> % ( $< 15$ vs $\geq 15$ ) episodes/hr	<b>4.71</b>	<b>1.934</b>	<b>11.469</b>	<b>0.0006</b>
Hosmer-Lemeshow p-value	0.71			
AUC (95% Wald CI)	<b>0.7226 (0.6914-0.7538)</b>			



# Discussion



ODI  
4%

ODI4% was an independent predictor of opioid-induced respiratory depression

15/hr

ODI4% of  $\geq 15$  episodes/hour are at higher risk of opioid-induced respiratory depression

24

To arrange closer postoperative monitoring for at risk patients

