Polysomnography (PSG) is the gold standard method for diagnosing OSA. Level 1 PSG is performed in a sleep laboratory with a technician in attendance; it measures respiratory, cardiovascular, and neurologic parameters. However, increasing demand and limited capacity to perform level 1 PSG have resulted in protracted wait times in publicly funded health care systems [18]. Level 3 PSG is performed using portable monitors and may be done in the patient's home. Unlike level 1 PSG, it is not able to detect non-respiratory sleep disorders nor does it typically measure stages of sleep, duration of sleep, or arousals. Despite these limitations, current guidelines recommend that level 3 PSG can be used to diagnose OSA in patients with a high pretest probability of moderate to severe OSA and who do not have signi f cant comorbid cardiopulmonary or neurologic conditions [19]. However, a major barrier to accessing level 3 PSG in our provincially-funded health care system (Alberta, Canada) is the need for the patient to bear the cost of these studies.

One potentially useful way to overcome these limitations is to use clinical predictors to identify patients with increased likelihood of OSA and perform testing in only these patients or prioritize these patients for faster objective testing. T is approach could potentially streamline use of PSG, decrease wait-times and reduce costs. Screening questionnaires, such as the Epworth Sleepiness Scale or the Berlin questionnaire are not su f ciently accurate to be used as stand-alone tools [20]. Previous studies aimed at deriving clinical prediction rules to inform the need for PSG have shown inconsistent results [21-23]. T erefore, no universally accepted and validated tool is currently being used in clinical practice.

T e objective of this cross-sectional study was to identify clinical predictors of moderate-to-severe OSA in patients referred to a large Canadian bariatric care program. T is program has a regional referral structure and is publicly funded; thus, the patient population is less highly selected than in previous studies [22,23]. We aimed to identify signi f cant predictors of moderate-to-severe OSA and, to compare these with previous studies, and to generate a clinical prediction rule for this condition in a severely obese population. We postulated that this tool may be relevant to streamline referrals for PSG by identifying those that are most likely to have OSA (rather than sending all patients for PSG as is currently being suggested).

Methods

Approval to conduct this cross-sectional study was obtained from the University of Alberta Research Ethics Board (PRO0030092).

Participants and setting

Subjects were recruited from the Edmonton Weight Wise adult bariatric specialty clinic. T is bariatric care clinic, established in 2005, serves as a catchment population of approximately 1.6 million residents and includes a central, reg

Variable

89 and 91%. However, when this model was evaluated in a different sample of patients by Kolotkin et al., the sensitivity and specifcity was found to be only 75% and 57%, respectively [22]. Instead, Kolotkin proposed a different 10-variable model consisting of neck circumference, systolic blood pressure, waist-hip ratio, waist, glucose,

13. DeMaria EJ, Portenier D, Wolfe L (2007) Obesity surgery mortality risk score: proposal for a clinically useful score to predict mortality risk in patients undergoing gastric bypass. Surg Obes Relat Dis 3: 134-140.
14. Giles TL, Lasserson TJ, Smith BJ, White J, Wright J, et al. (2006) Continuous positive airways pressure for obstructive sleep apnoea in adults. Cochrane Database Syst Rev.
15. Fava C, Dorigoni S, Dalle Vedove F, Danese E, Montagnana M, et al. (2014) Effect of CPAP on blood pressure in patients with OSA/hypopnea a systematic review and meta-analysis. Chest 145: 762-771.
16. Doherty LS, Kiely JL, Swan V, McNicholas WT (2005) Long-term effects of nasal continuous positive airway pressure therapy on cardiovascular outcomes in sleep apnea syndrome. Chest American College of Chest Physicians 127: 2076-84.
17. Marin JM, Carrizo SJ, Vicente E, Agusti AG (2005) Long-term cardiovascular outcomes in men with obstructive sleep apnoea-hypopnoea with or without treatment with continuous positive airway pressure: an observational study. Lancet 365: 1046-1053.
18. Flemons WW, Douglas NJ, Kuna ST, Rodenstein DO, Wheatley J (2004) Access to diagnosis and treatment of patients with suspected sleep apnea. Am J Respir Crit Care Med 169: 668-672.
19. Collop NA, Anderson WM, Boehlecke B, Claman D, Goldberg R, et al. (2007) Clinical guidelines for the use of unattended portable monitors in the diagnosis of obstructive sleep apnea in adult patients. Portable Monitoring Task Force of the American Academy of Sleep Medicine. J Clin Sleep Med. 737-47.
20. Epstein LJ, Kristo D, Strollo PJ Jr, Friedman N, Malhotra A, et al. (2009) Clinical guideline for the evaluation, management and long-term care of obstructive sleep apnea in adults. J Clin Sleep Med 5: 263-276.
21. Dixon JB, Schachter LM, O'Brien PE (2003) Predicting sleep apnea and excessive day sleepiness in the severely obese: indicators for polysomnography. Chest 123: 1134-1141.
22. Kolotkin RL, LaMonte MJ, Walker JM, Cloward TV, Davidson LE, et al.