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Research Article

Comparison of Wilson's Score and Intubation Prediction Score in Predicting Difficult Airway: A Prospective Single-Blind Observational Study

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ABSTRACT

Background: Anticipation of a difficult airway remains central to safe anaesthesia practice. Multiple bedside scoring systems exist; however, their diagnostic accuracy varies across populations and settings. **Aim:** To compare the diagnostic performance of Wilson's Score and the Intubation Prediction Score (IPS) in predicting difficult airway, using Intubation Difficulty Scale (IDS) as the reference standard. **Materials and Methods:** A prospective single-blind observational study was conducted among 170 adult patients (18–60 years), ASA I–II, undergoing elective surgery under general anaesthesia. Wilson's Score and IPS were assessed pre-operatively. Laryngoscopy and intubation were performed by experienced anaesthesiologists. IDS was recorded intra-operatively. Diagnostic performance parameters (sensitivity, specificity, PPV, NPV and accuracy) were computed, and comparisons were analysed. **Results:** Difficult intubation by IDS (>5) occurred in 72/170 (42.35%). Wilson's score demonstrated sensitivity 66.67% and specificity 75.38%, whereas IPS demonstrated sensitivity 80.00% and specificity 100.00%. IPS also had higher PPV (100.00% vs 48.39%), NPV (90.74% vs 80.33%) and overall accuracy (85.88% vs 75.29%). **Conclusion:** IPS showed superior diagnostic performance compared with Wilson's Score for predicting difficult airway in this cohort, with significantly higher specificity and PPV.

Keywords: Difficult airway; Wilson score; Intubation prediction score; Intubation difficulty scale; Preoperative airway assessment.

INTRODUCTION

Difficult tracheal intubation remains a major contributor to anaesthesia-related morbidity and mortality. Failure to anticipate a difficult airway can result in repeated laryngoscopy attempts, hypoxaemia, airway trauma, aspiration, cardiovascular instability and, rarely, catastrophic outcomes.

Preoperative airway assessment aims to identify patients at increased risk and to facilitate appropriate planning and resource allocation. Numerous bedside tests and composite scores have been described. Individual tests (e.g., Mallampati, thyromental distance) have limitations when used in isolation; therefore, composite indices incorporating multiple risk factors are often preferred.

Wilson's Score is one such composite tool that incorporates weight, head and neck movement, jaw movement, receding mandible and buck teeth. The Intubation Prediction Score (IPS) integrates clinical predictors commonly used at the bedside and categorises predicted intubation difficulty into graded levels.

However, the predictive performance of these scores can vary according to patient demographics, operator experience, and intubation technique. In addition, a score's clinical value depends not only on sensitivity but also on specificity and predictive values, which determine how effectively a tool can "rule in" or "rule out" difficult intubation.

The Intubation Difficulty Scale (IDS) is an intra-operative scoring system that quantifies intubation complexity based on factors such as number of attempts, number of operators, alternate techniques used, Cormack–Lehane grade, lifting force, external laryngeal pressure and vocal cord position. IDS provides a structured reference for categorizing intubation as easy, mildly difficult, or difficult.

This study was undertaken to compare Wilson's Score and IPS against IDS as a reference standard, and to identify which preoperative tool offers better diagnostic accuracy in predicting difficult airway among adult elective surgical patients.

AIM AND OBJECTIVES

Aim: To compare the diagnostic accuracy of Wilson's Score and Intubation Prediction Score (IPS) in predicting difficult airway using IDS as the reference standard.

Objectives:

- To determine the incidence of difficult intubation as per IDS in the study population.
- To describe the distribution of Wilson's Score components and IPS grades.
- To compute sensitivity, specificity, PPV, NPV and accuracy of Wilson's Score and IPS for predicting difficult airway (IDS >5).
- To compare diagnostic performance parameters between the two scores.

MATERIALS AND METHODS

Study design and setting: Prospective single-blind observational study conducted in the Department of Anaesthesiology at Madurai Medical college, Tamil Nadu.

Study period: 1 year

Sample size: 170 consecutive adult patients posted for elective surgery under general anaesthesia.

Inclusion criteria: Adult patients 18–60 years, ASA physical status I–II, planned elective surgery under general anaesthesia, and willingness to participate.

Exclusion criteria: Patient refusal, anticipated difficult mask ventilation requiring awake intubation, anatomical airway deformity/trauma/tumor, emergency surgeries, pregnancy, and other exclusions as per protocol.

Blinding: Preoperative airway assessment (Wilson's Score and IPS) was performed by an investigator not involved in intubation. The anaesthesiologist performing intubation was blinded to the preoperative scores.

Anaesthesia technique: Standard fasting guidelines were followed. Routine monitoring (ECG, NIBP, SpO_2) was applied. Induction and neuromuscular blockade were as per institutional practice. Direct laryngoscopy was performed using Macintosh blade and an appropriately sized cuffed endotracheal tube.

Outcome Assessment: IDS was recorded intra-operatively immediately after intubation, incorporating number of attempts (N1), number of operators (N2), number of alternate techniques (N3), Cormack–Lehane grade (N4), lifting force (N5), external laryngeal pressure (N6), and vocal cord position (N7).

Definition of difficult intubation: IDS >5 was considered difficult intubation, IDS 1–5 mildly difficult, and IDS 0 easy intubation.

Statistical analysis: Data were entered in Microsoft Excel and analysed using SPSS. Categorical variables were summarised as frequency and percentage. Diagnostic performance parameters (sensitivity, specificity, PPV, NPV and accuracy) were calculated. A p-value <0.05 was considered statistically significant.

Scoring systems used

Wilson's Score: A composite preoperative score based on five risk factors—weight, head and neck movement, jaw movement, receding mandible, and buck teeth—each graded from 0 to 2. Total score categorises predicted intubation as easy (<2), moderately difficult (3–7), or difficult (≥8).

Intubation Prediction Score (IPS): Preoperative score incorporating airway predictors to classify intubation difficulty into grades (Grade 1 easy; Grade 2 moderate; Grade 3 difficult) based on total points. In this study, IPS grades 1, 2 and 3 corresponded to increasing predicted difficulty.

Intubation Difficulty Scale (IDS): Intra-operative composite scale providing an objective measure of intubation complexity. IDS integrates number of attempts/operators, alternative techniques, glottic view, applied force, laryngeal pressure and vocal cord position. IDS >5 indicates moderate-to-major difficulty.

RESULTS

Participant characteristics. A total of 170 adult patients undergoing elective surgery under general anaesthesia were analysed. The cohort had a male predominance (108/170, 63.52%) and most patients were ASA II (130/170, 76.7%). Using grouped age data, the mean age was approximately 41.4 ± 11.5 years (range 20 to >60 years), with the largest proportion in the 26–30-year group (25/170, 14.7%).

Table No: 01. Baseline characteristics of participants (N=170).

Variable	Category / Statistic	n (%)
Age (years)	Mean ± SD (approx., grouped)	41.4 ± 11.5
Sex	Male	108 (63.52)
	Female	62 (36.48)
ASA physical status	I	40 (23.2)
	II	130 (76.7)

Pre-operative airway assessment scores. On Wilson scoring, 108/170 (63.52%) were classified as easy (score 0–2), 32/170 (18.82%) as moderately difficult (3–7), and 30/170 (17.64%) as difficult (8–10). The most frequently abnormal Wilson component was reduced head-and-neck movement (score 2 in 48/170, 28.23%); buck teeth and receding mandible scores of 2 were each present in 30/170 (17.64%).

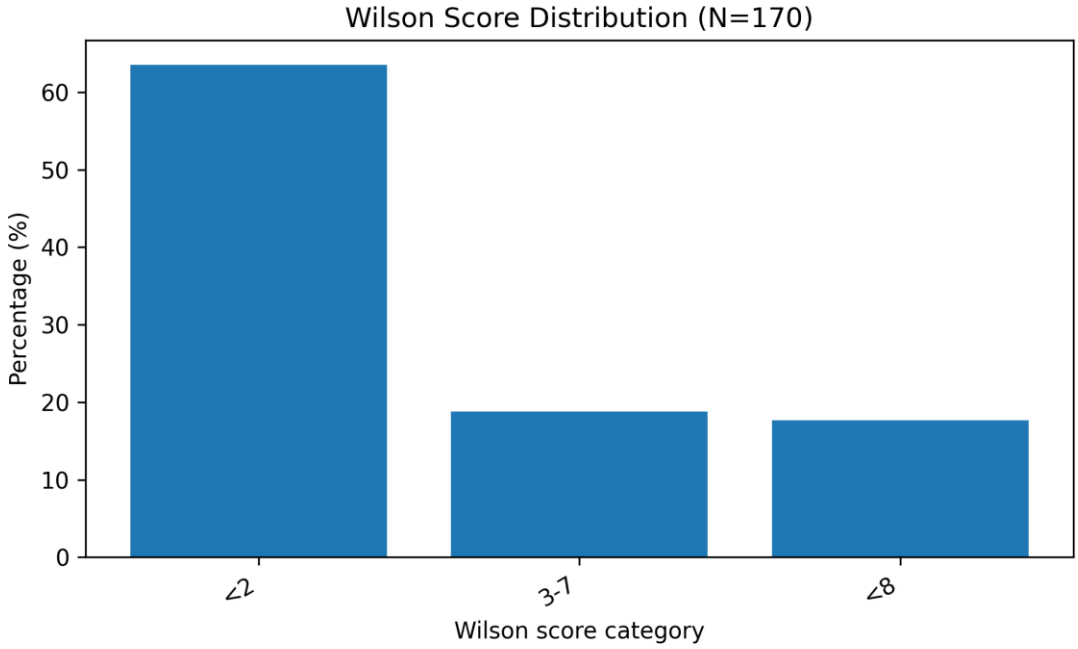

Figure No: 01. Wilson score distribution.

Using the Intubation Prediction Score (IPS), 80/170 (47.05%) were graded as easy (Grade 1), 42/170 (24.7%) as moderate (Grade 2), and 48/170 (28.23%) as difficult (Grade 3). Higher Mallampati classes (III–IV) were seen in 48/170 (28.22%). Restricted atlanto-occipital extension (Grades 3–4) was present in 48/170 (28.23%), and mandibular space assessment of 3–4 in 45/170 (26.47%).

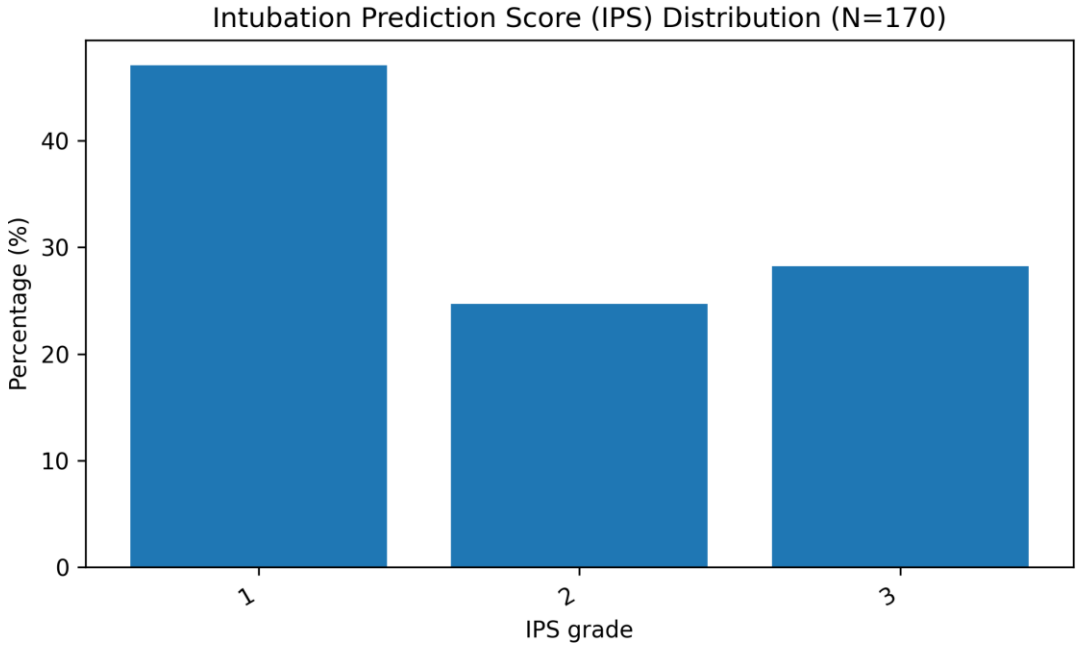

Figure No: 02. IPS distribution.

Intra-operative laryngoscopy and intubation characteristics. Successful intubation was achieved on the first attempt in 122/170 (72%), while 48/170 (28%) required more than one attempt. An alternate method was required in 24/170 (14%), and more than one operator was involved in 24/170 (14%). Cormack–Lehane grades III–IV occurred in 72/170 (42.39%). Increased lifting force was necessary in 51/170 (30%), and external laryngeal pressure was applied in 55/170 (33%). Vocal cords were abducted in 159/170 (93%) during laryngoscopy.

Table No. 02: Laryngoscopy/intubation characteristics and IDS distribution (N=170).

Parameter	Category	n (%)
Intubation attempts	1 attempt	122 (72)
	>1 attempt	48 (28)
Alternate method	Used	24 (14)
	Not used	146 (86)
Operators	Single operator	146 (86)
	>1 operator	24 (14)
Cormack–Lehane grade	I	80 (47.05)
	II	18 (10.58)
	III	24 (14.11)
	IV	48 (28.28)
Lifting force	Normal	119 (70)
	Increased	51 (30)
External laryngeal pressure	Not applied	115 (67)
	Applied	55 (33)
Vocal cord position	Abduction	159 (93)
	Adduction	11 (7)

Intubation Difficulty Scale (IDS)	0 (easy)	66 (38.82)
	1–5 (slight/moderate)	32 (18.82)
	>5 (difficult)	72 (42.35)

Overall, IDS >5 (difficult intubation) was observed in 72/170 (42.35%), indicating a substantial proportion of clinically relevant difficulty in this cohort. The distribution of IDS categories was used as the reference standard for evaluating the predictive performance of Wilson score and IPS.

Table No. 03: Prediction of difficult airway (reference standard: IDS >5).

Metric	Wilson score	IPS	p value
Sensitivity	66.67%	80.00%	0.005
Specificity	75.38%	100.00%	<0.0001
Positive Predictive Value	48.39%	100.00%	<0.0001
Negative Predictive Value	80.33%	90.74%	0.0064
Accuracy	75.29%	85.88%	0.0137

Diagnostic performance. Using IDS >5 as the criterion for difficult intubation, IPS demonstrated higher sensitivity (80.0%) and markedly higher specificity (100.0%) compared with Wilson score (66.67% and 75.38%, respectively). IPS also achieved superior accuracy (85.88% vs 75.29%) and a higher negative predictive value (90.74% vs 80.33%). The differences in key performance metrics were statistically significant as shown in Table No: 03.

Score-to-outcome concordance. When the cohort is considered at the classification level, Wilson score labelled 30/170 (17.64%) as difficult and IPS labelled 48/170 (28.23%) as difficult, compared with the IDS-defined difficult incidence of 72/170 (42.35%). Both tools therefore under-classified the observed difficult intubation rate, but IPS showed better alignment with the reference standard and correspondingly higher diagnostic performance metrics.

IDS category drivers. IDS >5 (difficult intubation) occurred in 72/170 (42.35%). Despite this, repeat attempts were required in only 48/170 (28%), alternative methods in 24/170 (14%), and additional operators in 24/170 (14%). This pattern indicates that intra-operative difficulty largely arose from laryngoscopic view and the need for optimisation manoeuvres rather than widespread failure of intubation.

Granular view of laryngoscopy and optimisation. Difficult laryngoscopic view was common, with Cormack–Lehane grade III–IV in 72/170 (42.39%) and grade IV alone in 48/170 (28.28%). Increased lifting force was required in 51/170 (30%), and external laryngeal pressure was applied in 55/170 (33%). Vocal cords were abducted in 159/170 (93%), suggesting that restricted glottic exposure was more commonly due to view/geometry than cord closure.

IPS component distribution. Mallampati class I–II comprised 122/170 (71.75%), while class III–IV comprised 48/170 (28.22%). Atlanto-occipital extension grades 1–2 were observed in 122/170 (71.76%), with grades 3–4 in 48/170 (28.23%). Mandibular space grades 1–2 were observed in 125/170 (73.52%), with grades 3–4 in 45/170 (26.47%). These three distributions jointly explain the IPS Grade 3 classification in 48/170 (28.23%).

Dental and mandibular features on Wilson score. Receding mandible scores indicated potential difficulty in 50/170 (29.41%) (score 1: 20/170, 11.76%; score 2: 30/170, 17.64%). Buck teeth were

graded as score 1 in 36/170 (21.17%) and score 2 in 30/170 (17.64%). Taken together, reduced extension, limited mouth opening, and mandibular/dental morphology were the dominant contributors to higher Wilson totals in this cohort.

Detailed Wilson component distribution. Weight contributed minimally: 157/170 (92.35%) scored 0 and 13/170 (7.64%) scored 1. Head-and-neck movement was more variable (0: 100/170, 58.82%; 1: 22/170, 12.94%; 2: 48/170, 28.23%). Jaw movement limitation (inter-incisor gap / subluxation) was present in 60/170 (35.28%) (score 1: 25/170, 14.70%; score 2: 35/170, 20.58%).

DISCUSSION

In this prospective single-blind observational study of 170 adult elective surgical patients, difficult intubation as per IDS (>5) was observed in 42.35%. The key finding is that IPS demonstrated superior diagnostic performance over Wilson's Score, with higher sensitivity, markedly higher specificity, and perfect PPV in this cohort.

Wilson's Score predicted difficult intubation in 17.64% of patients, whereas IDS identified difficult intubation in 42.35%. This discrepancy indicates under-prediction of difficulty by Wilson's Score when IDS is used as the reference, thereby reducing sensitivity and PPV. The composite nature of IDS (incorporating intra-operative difficulty) may capture additional elements not well reflected by preoperative anatomical predictors alone.

IPS predicted difficult intubation (Grade 3) in 28.23%, which, while still below the IDS-based incidence, demonstrated better alignment with IDS categories and a higher sensitivity (80.00%). Notably, IPS achieved 100% specificity and PPV in this dataset, suggesting strong rule-in capacity for difficult airway when IPS indicates Grade 3.

From a clinical decision-making standpoint, a preoperative tool with high specificity and PPV may be particularly valuable for triggering preparedness steps (advanced airway equipment, skilled personnel, alternative plans). Conversely, sensitivity is important to avoid missed difficult airways. The balance observed in IPS—improved sensitivity with very high specificity—supports its practical utility in routine pre-anaesthetic evaluation.

The observed distribution of Mallampati grades, atlanto-occipital extension and mandibular space further indicates that multiple factors contribute to difficult laryngoscopy and intubation. The high proportion of CL Grade 4 and requirement for additional force/pressure highlight the relevance of dynamic intra-operative factors captured by IDS.

Variability in difficult airway incidence and test performance across studies is expected due to differences in patient selection (BMI, craniofacial features), airway management protocols, operator expertise, and the reference standard used to define difficulty. Nonetheless, the present findings support the use of IPS as a more discriminative bedside score compared with Wilson's Score in this setting.

Future research may consider evaluating these tools across higher-risk populations (ASA III–IV, obesity, obstetric and emergency cases) and comparing them with other composite indices, as well as assessing inter-observer reliability for bedside scoring.

Training and quality improvement implications. Because the strongest difficulty signals in this cohort were related to glottic view and optimisation requirements, training initiatives that target positioning, laryngoscopy technique, and effective external laryngeal pressure may improve first-pass success. Capturing IPS grade alongside IDS components also enables audit cycles that identify which pre-operative deficits most commonly translate to intra-operative difficulty, thereby guiding targeted interventions.

IDS as a composite reference. IDS captures intra-operative difficulty beyond anatomical prediction; however, it can be influenced by operator thresholds for interventions such as external pressure or adjunct use. Therefore, a higher IDS score may represent appropriate safety-oriented management rather than a poor outcome. Even with this nuance, IDS remains a useful composite standard for comparing predictive tools because it reflects real-world difficulty encountered during airway management.

How to operationalise results. A pragmatic approach is to use IPS as the primary bedside screening tool and to document a standardised airway plan for all Grade 3 patients, while applying targeted optimisation for Grade 2 patients (positioning, pre-oxygenation, and ensuring availability of adjuncts). For Grade 1 patients, standard preparation remains appropriate, while still adhering to universal readiness principles. Embedding this in the pre-anaesthetic checklist can improve consistency and reduce variability across providers.

Mechanistic rationale for IPS advantage. IPS combines three elements that directly influence laryngoscopy mechanics: oropharyngeal view (Mallampati), cervical extension, and mandibular space. In contrast, Wilson score allocates a full component to weight, which contributed little in this cohort, while several mechanical constraints (extension and mouth opening) were relatively prevalent. These structural differences likely explain why IPS demonstrated higher sensitivity and substantially higher specificity compared with Wilson score.

Interpretation of high specificity of IPS. The most clinically actionable property of IPS in this dataset was its perfect specificity and PPV. In practice, a Grade 3 IPS score can be used as a trigger for heightened preparedness: experienced laryngoscopist, documented airway strategy, and readiness of adjuncts/rescue devices according to institutional protocol. This "rule-in" capability is particularly valuable in routine elective settings where indiscriminate escalation is impractical.

LIMITATIONS

- Composite airway assessments may be influenced by inter-observer variability, particularly for subjective parameters such as mouth opening grading or mandibular assessment.
- This study was conducted in an elective surgical population with ASA I–II; generalisability to emergency settings or higher-risk patients may be limited.
- Use of IDS as the reference standard, while structured, includes factors related to operator technique and intra-operative choices, which can introduce performance variability.

CONCLUSION

Intubation Prediction Score demonstrated better sensitivity, specificity, PPV, NPV and overall accuracy than Wilson's Score for predicting difficult airway when compared against IDS as the reference. IPS may be preferred as a bedside preoperative screening tool for difficult airway prediction in adult elective surgical patients.

ANNEXURE: SCORING TOOLS USED IN THE STUDY

Wilson's Score (WS): Five components are scored 0–2 each: weight, head and neck movement, jaw movement (inter-incisor gap / subluxation), receding mandible, and buck teeth. Total score ranges from 0–10. Interpretation used in this study: ≤2 = easy, 3–7 = moderately difficult, and ≥8 = difficult.

Intubation Prediction Score (IPS): Pre-operative grading includes Mallampati class (I–IV), atlanto-occipital joint extension (Grade 1–4), and mandibular space assessment (Grade 1–3). The

summed score is interpreted as 3–4 (Grade 1: easy), 5–8 (Grade 2: moderate), and 9–12 (Grade 3: difficult).

Intubation Difficulty Scale (IDS): An intra-operative composite score incorporating number of additional attempts, number of additional operators, use of alternative techniques, Cormack–Lehane grade, increased lifting force, application of external laryngeal pressure, and vocal cord adduction. Interpretation: 0 = easy, 1–5 = mild difficulty, and >5 = moderate-to-major difficulty.

REFERENCES

1. Adnet F, M.D., Ph.D.; Baillard C, M.D.; Borron S W, M.D., M.S.; Denantes C, M.D.; Lefebvre L, M.D., Galinski M , M.D.., Martinez C M.D., Cupa M, , M.D. ,Lapostolle F , , M.D. Randomized Study Comparing the "Sniffing Position" with Simple Head Extension for Laryngoscopic View in Elective Surgery Patients. Anesthesiology 2001;95; 836-41.
2. Agasti T.K. Textbook of Anaesthesia for post graduates. First ed.JAYPEE Medical Ltd; 2011. P 547- 548.
3. A K. Gupta, Mohamad O, Showkat N, Imtiyaz N , Anjali M. Prediction of difficult intubation study in kashmiri population : Pravara Med Rev 2009; 1(4).
4. Ali MA, Qamar-ul-Hoda M, Samad K. Comparison of upper lip bite test with Mallampati test in the prediction of difficult intubation at a tertiary care hospital of Pakistan. J Pak Med Assoc. 2012;62:1012–5. 96
5. Cattano D, Panicucci E, Paolicchi A, Forfori F, Giunta F, Hagberg C: Risk factors assessment of the difficult airway: An Italian survey of 1956 patients. AnesthAnalg. 2004; 99(6):1774-1779.
6. Chhatrapati S, Bloria S, Singh N, Paul S, Luthra A, Kataria KK, Vithani S, Omar S, Narayanan Nayanar V K. Comparison of modified Mallampati test and thyromental height test for preoperative airway assessment: A prospective observational study. Indian Anaesth Forum 2021; 22:47-52.
7. "Clinical Criteria for Airway Assessment: Correlations with Laryngoscopy and Endotracheal Intubation Conditions" written by Gustavo Henrique S. Wanderley, Luciana Cavalcanti Lima, TâniaCursino de MenezesCouceiro, Waston Vieira Silva, Raquel Queiroz G. A. Coelho, Andrea Cavalcanti C. Lucena, Anne Danielle Santos Soares, published by Open Journal of Anesthesiology, Vol.3 No.7, 2013.
8. Crosby ET, Cooper RM, Douglas MJ, Doyle DJ, Hung OR, Labrecque P. The unanticipated difficult airway with recommendations for management. Canadian Journal of Anaesthesia 1998; 45:757-776.
9. Dhanger S, Gupta SL, Vinayagam S, Bidkar PU, Elakkumanan LB, Badhe AS. Diagnostic accuracy of bedside tests for predicting difficult intubation in Indian 98 population: An observational study. Anesth Essays Res. 2016 Jan-Apr; 10(1):54-8.
10. LaviniaBergesio,NadiaRuggieri,OrazioDifrancesco *et al.*l difficult airway management in patients submitted to general anaesthesia.Is it a matter of devices or predictive scores 2016
11. Lee A, Fan LT, Gin T, Karmakar MK, NganKee WD. A systematic review (metaanalysis) of the accuracy of the Mallampati tests to predict the difficult airway. AnesthAnalg. 2006;102: 1867-78.
12. Mallampati SR, Gatt SP, Gugino LD, Desai SP, Waraksa B, Freiberger D, Liu PL. A clinical sign to predict difficult tracheal intubation: a prospective study. Canadian Anaesthetists Society Journal 1985; 32: 429-434.

13. Malthew M, Hanna LS, Aldree JA: Preoperative indices to anticipate the difficult tracheal intubation. AnesthAnalg 1989;68:S187 (abstract).
14. Moody M. I, Kremer M.J. Predictive Activities: A Cloud Malpractice Claims Perspective. AANA Jpurnal 2001; 69: 461-465
15. Moon H. Y, Baek C W, Kim J. S, Koo G. H, Kim J. Y, Woo Y. C, Jung Y. H, Kang H, Shin H. Y ,and Yang S. Y. The causes of difficult tracheal intubation andpreoperative assessments in different age groups; Korean J Anesthesiol 2013 Apr; 64(4): 308–314. 100
16. Naguib M, Malabarey T, AlSatli RA, Al Damegh S, Samarkandi AH. Predictive models for difficult laryngoscopy and intubation. A clinical, radiologic and threedimensional computer imaging study. Can J Anaesth. 1999; 46(8):748-59Norskov Anders Kehlet *et al.*l preoperative airway assessment- experience gained from a multicenter cluster randomized trail and Danish anaesthesia database
17. Perucho A, Arino JJ, Sante L, Yuste J, Timoneda FL. Recognition of the difficult airway. an integrated test. Br J Anaesth. 1997;78:11. abstract.
18. PatelVU,StehlingLC,ZauderHL,Predicting the difficulty of intubation utilizing an intubation guide.Anaesthesiology,1983:10:32
19. Siddiqui KM, Hameed F, Ali MA. Diagnostic Accuracy of Combined Mallampati and Wilson Score to Predict Difficult Intubation in Obese Patients: A Descriptive Cross-sectional Study. Anesth Pain Med. 2022 Jan 31; 11(6):e118626. 102
20. Shiga T.MD., Ph.D , Wajima Z. M.D., Ph.D, Inoue T M.D., Ph.D, , Sakamoto A. M.D., Ph.D, Predicting difficult intubation in apparently normal patients: a meta-analysis of bedside screening test performance Anesthesiology 2005;103:429-37.
21. Toshiya Shiga, Zen'ichiroWajima, Tetsuo Inoue, Atsuhiro Sakamoto; Predicting Difficult Intubation in Apparently Normal Patients: A Meta-analysis of Bedside Screening Test Performance. Anesthesiology 2005; 103:429–437.
22. Toshiya Samsoon GLT, Young JRB. Difficult tracheal intubation: a retrospective study. Anaesthesia 1987; 42: 487-490.
23. Tunstall ME. Anaesthetists for Obstetric. In: Gray TC, Nunn JF, Utting JE, General Anaesthesia 4th Ed. Butterworths 1980.
24. Vidhya S, Sharma B, Swain BP, Singh UK. Comparison of sensitivity, specificity, and accuracy of Wilson's score and intubation prediction score for prediction of difficult airway in an eastern Indian population-A prospective single-blind study. J Family Med Prim Care. 2020 Mar 26;9(3):1436-1441.
25. Wilson ME, Spiegelhalter D, Robertson JA, Lesser P. Predicting difficult intubation. Br J Anaesth. 1988;61:211–6.
26. Wanderley,LucianaCavalcantiLima,Wastonvierasillva,RaquelQueiroz ,Lucena,AnneDaniella Santos *et al.*l clinical criteria for aiwayassessment:correlations with laryngoscopy and endotracheal intubation condition