e-ISSN: 0975-9506, p-ISSN: 2961-6093

Available online on www.ijpqa.com doi: 10.25258/ijpqa.16.6.72

International Journal of Pharmaceutical Quality Assurance 2025; 16(6); 435-441

Original Research Article

A Comparative Study of Dexmedetomidine versus Propofol for Procedural Sedation in Minor Surgical Interventions

Vikash Gaurav

Specialist Medical Officer, Department of Anesthesia, Sadar Hospital, Koderma, Jharkhand, India

Received: 02-04-2025 / Revised: 21-05-2025 / Accepted: 25-06-2025

Corresponding Author: Dr. Vikash Gaurav

Conflict of interest: Nil

Abstract:

Background: "Dexmedetomidine and propofol are widely used intravenous sedatives for short procedures requiring rapid onset, adequate sedation depth, hemodynamic stability, and early recovery. Their distinct pharmacological profiles influence clinical outcomes.

Aim: To compare the efficacy, hemodynamic effects, recovery characteristics, adverse events, and satisfaction outcomes of dexmedetomidine versus propofol for sedation in short procedures.

Methodology: This prospective, randomized comparative study included 90 ASA I–II patients (18–60 years) undergoing elective short procedures (≤60 minutes) under monitored anesthesia care. Patients were allocated into Group D (dexmedetomidine, n=45) and Group P (propofol, n=45). Hemodynamic parameters, Ramsay Sedation Score, recovery time (Aldrete score ≥9), adverse events, and satisfaction scores were assessed and analyzed using SPSS v27.

Results: Demographic characteristics were comparable between groups. Dexmedetomidine showed better hemodynamic stability with higher minimum MAP ($p=0.002$) and SpO_2 ($p=0.018$), and fewer respiratory events ($p<0.05$), but more bradycardia ($p=0.046$). Propofol provided faster onset ($p=0.001$) and shorter recovery time ($p=0.001$). Sedation depth was comparable. Surgeon satisfaction was significantly higher with dexmedetomidine ($p=0.009$).

Conclusion: Both agents are effective for short procedural sedation. Dexmedetomidine offers superior cardiorespiratory stability, whereas propofol ensures faster recovery. Agent selection should be individualized.

Keywords: Dexmedetomidine, Propofol, Short procedures, Procedural sedation, Hemodynamic stability, Recovery profile.

Introduction

Dexmedetomidine and propofol are common intravenous sedative drugs to use in moderate diagnostic and therapeutic operations in which the immediate effect of the drugs, sufficient depth of sedation, lack of" hemodynamic effect, and quick recuperation is necessary [1]. Endoscopy, bronchoscopy, minor surgery, interventional radiology, dental procedures are examples of short procedures "that need sedative regimens to allow patient comfort and immobility of the procedure without any harm to cardiorespiratory functions. The perfect sedative agent must make anxiolysis, amnesia, analgesia and quick recovery with fewer side effects [2]. Dexmedetomidine and propofol are the two most widely used agents that can be compared as they have markedly different pharmacodynamic and pharmacokinetic profiles among the existing agents.

Dexmedetomidine is a very selective 2-adrenergic receptor agonist which has an effect of sedation by binding to the locus coeruleus located in the brainstem [3]. Compared to the conventional sedatives which mainly increase the activity of gamma-aminobutyric acid (GABA), dexmedetomidine produces an apparent state of natural sleep, which is easily aroused and cooperates in sedation [4]. It also has analgesic and sympatholytic effects, which minimize stress response and opioid needs. This is why dexmedetomidine is especially appealing in short surgeries which demand patient cooperation like in the case of awake fiberoptic intubation or when using monitored anesthesia care, such as minor surgery. Significantly, the respiratory depression caused by dexmedetomidine is at minimum, a low level, which is a crucial benefit in the procedures that are carried out without airway instrumentation [5]. Its application can however be limited because of dose-dependent bradycardia and hypotension as a result of reduced sympathetic outflow.

Propofol, in contrast, is a short-term intravenous anesthetic, which is mainly made by stimulation of the GABA A receptor, resulting in quick drowsiness and hypnosis [6]. It is known to have a fast rate of

action and a short half-life that is context-sensitive and is easy to titrate and recover, which is quite beneficial when performing ambulatory and short-running procedures. Propofol is a reliable sedation that can be heavily used in a variety of operations which include gastrointestinal endoscopy and minor surgeries since the recovery profile of propofol is predictable and reliable [7]. Propofol however is linked to respiratory depression which is dose-dependent, hypotension and airway reflex loss. All these negative effects require special attention and, in certain circumstances, airway assistance, especially in the case of high-risk groups (e.g., elderly patients or those with serious comorbidities).

Over the past few years, the comparison of dexmedetomidine and propofol has become the subject of a growing interest because of the changing requirements of the procedure and the increased focus on the safety and satisfaction of patients [8]. Minor surgeries are usually conducted in out-patient rooms where early discharge and low complications are very important. The strategies in sedation need to be hemodynamic and respiratory stable with a balance between rapid onset and off-set. The limited effects of dexmedetomidine on respiratory drive could be an opportunity in non-intubated patients, whereas propofol having a higher titratability rate and a deeper profile of sedation could be a better procedure in some situations. Moreover, outcome measures that are important in comparative studies are patient and operator satisfaction, characteristics of recovery, analgesic needs, and adverse event incidences [9].

The other significant point of care in short procedures is the effect of the choice of sedatives on the recovery patterns and cognitive capacity. Ambulatory care involves rapid awakening and recovery of baseline psychomotor performance that are essential to support early discharge and decrease healthcare expenditures [10]. Propofol is also known to have fast recovery and antiemetic that lead to less post-anesthesia care unit stay. Although dexmedetomidine might be linked to a longer recovery time than propofol in some cases, it can lead to fewer emergences less delirium with less agitation, and in older patients. Moreover, opioid-sparing effect could minimize postoperative nausea, vomiting, and respiratory complications.

Another very important area of comparison is hemodynamic effects. Propofol habitually results in the systemic vasodilation and myocardial depression, which result in hypotension, particularly during bolus administration. Dexmedetomidine, by its sympatholytic effect, can as well cause hypotension and bradycardia although it is more likely to achieve respiratory stability. The selection of these agents is usually affected by support of patient-specific aspects, procedural demands, and institutional guidelines. Dexmedetomidine can be a better choice in patients with impaired respiration, with propofol being a better option in cases of urgent induction and more profound sedation.

With the current growth in the number of short procedural surgeries across the globe, the optimization of sedation has turned into an anesthesiological and procedural medical issue. The use of dexmedetomidine and propofol in the treatment of different clinical conditions is a relative area that needs to be compared and contrasted with other techniques to ascertain the efficacy, safety and cost-effectiveness of the drugs. Their pharmacological differences, clinical impacts, and risk profiles will help clinicians to customize the sedation approaches based on the patient traits and the requirements of the procedures. Hence, the comparative study of dexmedetomidine and propofol in short-term procedures is clinically important as well as needed to improve patient outcomes, procedural performance, and the quality of care.

Methodology

Study Design: The present study was designed as a prospective, comparative, randomized clinical study to evaluate and compare the efficacy and safety of dexmedetomidine versus propofol for sedation in patients undergoing short surgical procedures. The study aimed to assess sedation quality, hemodynamic stability, recovery characteristics, and adverse events associated with both agents.

Study Area: The study was conducted in the Department of Anesthesia, Sadar Hospital, Koderma, Jharkhand, India

Study Duration: The study was carried out over a period of 7 months from March 2024 to September 2024

Study Participants

Inclusion Criteria

- Patients aged 18 to 60 years.
- Patients of either gender.
- Patients scheduled for elective short surgical or diagnostic procedures (duration ≤60 minutes) under monitored anesthesia care.
- Patients classified as American Society of Anesthesiologists (ASA) physical status I or II.
- Patients who provided written informed consent to participate in the study.

Exclusion Criteria

- Patients with known hypersensitivity to dexmedetomidine or propofol.
- Patients with significant cardiac conduction abnormalities (e.g., heart block, severe bradycardia).
- Patients with uncontrolled hypertension or hypotension.

- Patients with severe hepatic or renal dysfunction.
- Pregnant or lactating women.
- Patients with psychiatric illness or those on chronic sedative or opioid therapy.
- Patients requiring general anesthesia with airway instrumentation.

Sample Size: A total of 90 patients were included in the study. The participants were randomly allocated into two equal groups of 45 patients each. Group D received dexmedetomidine for sedation, while Group P received propofol.

Procedure: All participants before the researchers used computer-based randomization to create two study groups. The medical team established standard monitoring procedures which included non-invasive blood pressure (NIBP) and electrocardiography (ECG) and pulse oximetry (SpO_2) and respiratory rate measurements after the patient arrived in the operating room. The researchers recorded baseline hemodynamic parameters.

Patients in Group D received a loading dose of dexmedetomidine 1 µg/kg which doctors administered through intravenous delivery for 10 minutes. Doctors used the maintenance infusion of 0.2–0.7 µg/kg/hour to adjust the patient's sedation level until they achieved the desired sedation level. Group P patients received their first dose of propofol through an intravenous bolus which delivered 1 mg/kg. The maintenance infusion of 25–75 µg/kg/min was used to adjust sedation levels according to the patient's requirements.

The Ramsay Sedation Scale (RSS) was used to measure sedation levels with the goal of achieving a score between 3 and 4 which would indicate proper control of sedation during medical procedures. The researchers collected hemodynamic data which included heart rate and both systolic and diastolic blood pressure readings and mean arterial pressure and oxygen saturation levels at three different times. The medical team documented all adverse events which included hypotension and bradycardia and respiratory depression and oxygen desaturation and then proceeded to manage them correctly.

The procedure concluded with the termination of sedative infusions, which marked the beginning of recovery until the patient reached an Aldrete score ≥9. The team collected data on post-procedure complications and measured both patient and surgeon satisfaction.

Statistical Analysis: Data collected were entered into Microsoft Excel and analyzed using Statistical Package for the Social Sciences (SPSS) version 27.0. Continuous variables were expressed as mean ± standard deviation (SD), while categorical variables were presented as frequencies and percentages. The independent Student's t-test was used to compare continuous variables between the two groups. The Chi-square test or Fisher's exact test was applied for comparison of categorical variables where appropriate. A p-value of less than 0.05 was considered statistically significant.

Result

Table 1 shows the demographic characteristics of the study participants in Group D and Group P, each comprising 45 individuals. The mean age in Group D was 38.6 ± 10.2 years, while in Group P it was 40.1 ± 9.8 years, with no statistically significant difference between the groups (p = 0.482). In terms of gender distribution, males constituted 53.3% in Group D and 57.8% in Group P, whereas females accounted for 46.7% and 42.2%, respectively, again showing no significant difference (p = 0.668). The mean body weight was comparable between the groups, being 64.5 ± 8.4 kg in Group D and 66.2 ± 7.9 kg in Group P (p = 0.341). Regarding ASA physical status, 60% of participants in Group D and 64.4% in Group P were classified as ASA I, while 40% and 35.6% were ASA II, respectively, with no significant variation (p = 0.672). Overall, both groups were demographically comparable.

Table 1: Demographic Characteristics of Study Participants

Variable	Group D (n=45)	Group P (n=45)	p-value
Age (years) (Mean ± SD)	38.6 ± 10.2	40.1 ± 9.8	0.482
Male, n (%)	24 (53.3%)	26 (57.8%)	0.668
Female, n (%)	21 (46.7%)	19 (42.2%)	
Weight (kg) (Mean ± SD)	64.5 ± 8.4	66.2 ± 7.9	0.341
ASA I, n (%)	27 (60%)	29 (64.4%)	0.672
ASA II, n (%)	18 (40%)	16 (35.6%)	

Table 2 presents the comparison of hemodynamic parameters between Group D and Group P during the procedure. The baseline heart rate (HR) was comparable between the two groups (82.4 ± 9.6 vs 84.1 ± 10.2 beats/min; p = 0.421), indicating no significant difference at the start of the procedure. However, the lowest HR recorded during the procedure was significantly lower in Group D (68.3 ± 8.1) compared to Group P (75.6 ± 9.4), with a statistically significant p-value of 0.001. Similarly, baseline mean arterial pressure (MAP) was comparable (93.5 ± 7.8 vs 94.2 ± 8.1 mmHg; p = 0.673), but the lowest

MAP during the procedure was significantly higher in Group D (81.4 ± 6.5) than in Group P (74.8 ± 7.3), with p = 0.002. Additionally, SpO_2 was significantly higher in Group D (98.6 ± 1.2%) compared to Group P (97.9 ± 1.8%), with p = 0.018. Overall, Group D demonstrated better hemodynamic stability during the procedure.

Table 2: Hemodynamic Parameters During Procedure			
Parameter	**Group D (Mean ± SD)**	**Group P (Mean ± SD)**	**p-value**
Baseline HR (beats/min)	82.4 ± 9.6	84.1 ± 10.2	0.421
Lowest HR during procedure	68.3 ± 8.1	75.6 ± 9.4	0.001
Baseline MAP (mmHg)	93.5 ± 7.8	94.2 ± 8.1	0.673
Lowest MAP during procedure	81.4 ± 6.5	74.8 ± 7.3	0.002
SpO_2 (%)	98.6 ± 1.2	97.9 ± 1.8	0.018

Table 3 shows the comparison of sedation and recovery characteristics between Group D and Group P. The mean time to achieve target sedation was significantly longer in Group D (9.8 ± 2.1 minutes) compared to Group P (6.4 ± 1.8 minutes), with a statistically significant difference (p = 0.001), indicating faster onset of sedation in Group P. The average Ramsay Sedation Score was comparable between the two groups (3.6 ± 0.5 in Group D vs 3.8 ± 0.6 in Group P), with no statistically significant difference (p = 0.094), suggesting similar depth of sedation. The duration of the procedure was also similar in both groups (p = 0.724). However, recovery time was significantly shorter in Group P (7.9 ± 2.5 minutes) compared to Group D (11.6 ± 3.2 minutes), with p = 0.001. Additionally, a significantly higher proportion of patients in Group P achieved an Aldrete score ≥9 at 10 minutes (91.1% vs 71.1%, p = 0.018), indicating faster recovery in Group P.

Table 3: Sedation and Recovery Characteristics			
Variable	**Group D (Mean ± SD)**	**Group P (Mean ± SD)**	**p-value**
Time to achieve target sedation (min)	9.8 ± 2.1	6.4 ± 1.8	0.001
Ramsay Sedation Score (average)	3.6 ± 0.5	3.8 ± 0.6	0.094
Duration of procedure (min)	38.2 ± 9.4	37.5 ± 8.9	0.724
Recovery time (min)	11.6 ± 3.2	7.9 ± 2.5	0.001
Aldrete score ≥9 at 10 min, n (%)	32 (71.1%)	41 (91.1%)	0.018

Table 4 shows the comparison of intraoperative adverse events between Group D and Group P, each comprising 45 patients. Bradycardia was significantly more common in Group D (17.8%) compared to Group P (4.4%) with a p-value of 0.046. In contrast, hypotension occurred more frequently in Group P (26.7%) than in Group D (11.1%), which was statistically significant (p = 0.048). Respiratory depression was markedly higher in Group P (20%) compared to Group D (2.2%), showing strong statistical significance (p = 0.008). Similarly, oxygen desaturation (<94%) was observed only in Group P (13.3%) and not in Group D, with a significant p-value of 0.012. However, nausea and vomiting were slightly higher in Group P (11.1%) than in Group D (6.7%), but this difference was not statistically significant (p = 0.462). Overall, Group P demonstrated a higher incidence of respiratory-related complications, whereas bradycardia was more common in Group D.

Table 4: Intraoperative Adverse Events			
Adverse Event	**Group D (n=45)**	**Group P (n=45)**	**p-value**
Bradycardia	8 (17.8%)	2 (4.4%)	0.046
Hypotension	5 (11.1%)	12 (26.7%)	0.048
Respiratory depression	1 (2.2%)	9 (20%)	0.008
Oxygen desaturation (<94%)	0 (0%)	6 (13.3%)	0.012
Nausea/Vomiting	3 (6.7%)	5 (11.1%)	0.462

Table 5 shows that the mean patient satisfaction score was slightly higher in Group D (4.4 ± 0.6) compared to Group P (4.2 ± 0.7); however, this difference was not statistically significant (p = 0.167), indicating comparable patient-perceived satisfaction between the two groups. In contrast, the surgeon satisfaction score was significantly higher in Group D (4.5 ± 0.5) than in Group P (4.1 ± 0.6), with a statistically significant p-value of 0.009, suggesting better intraoperative conditions or overall performance in Group D from the surgeon's perspective. Regarding the need for rescue sedation, 4 patients (8.9%) in Group D required additional sedation compared to 7 patients (15.6%) in Group P, but this difference was not statistically significant (p = 0.337). Overall, while patient satisfaction and

"rescue sedation requirements were comparable, surgeon satisfaction was significantly better in Group D.

Table 5: Patient and Surgeon Satisfaction Scores			
Variable	**Group D (Mean ± SD)**	**Group P (Mean ± SD)**	**p-value**
Patient satisfaction score (1–5)	4.4 ± 0.6	4.2 ± 0.7	0.167
Surgeon satisfaction score (1–5)	4.5 ± 0.5	4.1 ± 0.6	0.009
Need for rescue sedation, n (%)	4 (8.9%)	7 (15.6%)	0.337

Discussion

The present study demonstrated that both dexmedetomidine and propofol are effective sedative agents for short procedures; however, they differ significantly in their hemodynamic profiles, recovery characteristics, and adverse event patterns. These findings are consistent with previously published literature comparing these two agents in perioperative and critical care settings.

Our observation of comparable demographic characteristics between the two groups aligns with the randomized design used in earlier trials such as the study by Herr DL et al. (2003) [11], which reported similar baseline characteristics between dexmedetomidine and propofol groups in post–coronary artery bypass graft patients. Ensuring demographic homogeneity strengthens internal validity and supports those differences observed are attributable to pharmacologic properties rather than patient-related confounders.

Our investigation showed that Group D (dexmedetomidine) maintained better mean arterial pressure during their medical treatment while showing lower heart rate levels than Group P (propofol) their testing group. The results show similarities to the work of Anger KE et al. (2010) [12] which found that dexmedetomidine treatment led to a 14% lower hypotension rate than propofol treatment in patients who used mechanical ventilation after cardiac surgery. The research of" Martin E et al. (2003) [13] found that dexmedetomidine caused bradycardia which depended on the dosage used although "it maintained blood pressure better than other sedatives. Propofol causes vasodilation and myocardial depression which lead to hypotension according to Marik PE (2004) [14] who found that propofol infusions caused clinically important hypotension in 25 to 30 percent of patients. The findings show that Group D showed higher oxygen saturation levels combined with fewer respiratory issues which supports previous research that showed dexmedetomidine maintains respiratory drive while propofol leads to respiratory depression which depends on the dosage used.

The study results show that propofol leads to faster sedation onset times and shorter recovery duration when compared to dexmedetomidine, which shows longer recovery periods. The pharmacokinetic characteristics of propofol enable it to achieve rapid body redistribution and body clearance of the drug. A study by SEDATION. (2009) [15] found that dexmedetomidine achieved its target sedation level faster than propofol because propofol permitted more rapid dosage adjustments and provided faster recovery times in specific medical situations. Pandharipande PP et al. (2007) [16] found that dexmedetomidine and other sedatives produced similar sedation results but their onset times showed different patterns. The two groups achieved similar Ramsay Sedation Scores which shows that both sedation methods successfully maintained the needed depth of sedation but their onset and recovery times were different.

The study showed that dexmedetomidine treatment caused more bradycardia cases while propofol treatment led to greater hypotension and respiratory depression cases. The results of this study match the research findings from Gerlach AT et al. (2009) [17] which showed that patients experienced bradycardia between 5 and 42 percent when they received dexmedetomidine treatment at higher dosage levels or through rapid infusion methods. The medical literature establishes propofol as a drug that causes both respiratory depression and hypotension effects. Roberts RJ et al. (2009) [18] conducted a multicenter study which showed that prolonged propofol infusions led to substantial metabolic and cardiovascular adverse effects that required continuous patient observation. The Group P oxygen desaturation cases showed higher rates because our short medical procedures did not result in serious propofol infusion syndrome complications which showed greater effects on breathing patterns during brief medical procedures.

Our research revealed that the dexmedetomidine group showed equal patient satisfaction results which led to higher surgeon satisfaction. Barletta JF et al. (2009) [19] documented that dexmedetomidine treatment improved surgical conditions while decreasing the need for additional pain relief medications. Dexamethasone provides surgical advantages through its ability to maintain stable operating environments while enabling patients to stay awake during brief operations that need them to remain still.

Interestingly, while our study demonstrated faster recovery with propofol, previous literature such as

the trial by Herr DL et al. (2003) reported shorter time to extubation in dexmedetomidine-treated patients compared to propofol. This contrast may be explained by differences in clinical context—our study involved short procedural sedation rather than prolonged postoperative ventilation. In brief procedures, propofol's rapid redistribution likely confers a recovery advantage, whereas in mechanically ventilated ICU patients, dexmedetomidine's lighter, cooperative sedation may facilitate earlier extubation.

Overall, our findings show that dexmedetomidine provides superior hemodynamic and respiratory stability but is associated with bradycardia and slower recovery, whereas propofol offers rapid onset and emergence at the expense of greater hypotension and respiratory depression. The choice between these agents should therefore be individualized, taking into account patient cardiovascular status, need for rapid recovery, and procedural requirements. Future prospective randomized studies focusing specifically on short procedural settings would further clarify" optimal agent selection and cost-effectiveness.

Conclusion

The present study demonstrates that both dexmedetomidine and propofol are effective agents for sedation in short procedures, achieving comparable depth of sedation and high patient satisfaction. However, they differ significantly in their hemodynamic profiles, recovery characteristics, and adverse event patterns. Dexmedetomidine provided better hemodynamic stability, higher oxygen saturation levels, fewer respiratory complications, and greater surgeon satisfaction, although it was associated with a higher incidence of bradycardia and relatively longer recovery time. In contrast, propofol offered faster onset of sedation and quicker recovery but was associated with increased hypotension and respiratory depression. Therefore, the choice of sedative agent should be individualized based on patient characteristics, procedural requirements, and the need to balance rapid recovery with cardiorespiratory stability.

References

1. Ter Bruggen FF, Eralp I, Jansen CK, Stronks DL, Huygen FJ. Efficacy of dexmedetomidine as a sole sedative agent in small diagnostic and therapeutic procedures: a systematic review. Pain Practice. 2017 Jul;17(6):829-40.
2. Liu LL, Gropper MA. Postoperative analgesia and sedation in the adult intensive care unit: a guide to drug selection. Drugs. 2003 Apr;63(8):755-67.
3. Kumar R, Aakanksha AK, Verma NK, Saxena AC, Hoque M. Systemic effects and clinical application of dexmedetomidine. Pharm Innov J. 2020;9(11):241-6.
4. Brohan J, Goudra BG. The role of GABA receptor agonists in anesthesia and sedation. CNS drugs. 2017 Oct;31(10):845-56.
5. Devlin JW, Al-Qadheeb NS, Chi A, Roberts RJ, Qawi I, Garpestad E, Hill NS. Efficacy and safety of early dexmedetomidine during noninvasive ventilation for patients with acute respiratory failure: a randomized, double-blind, placebo-controlled pilot study. Chest. 2014 Jun 1;145(6):1204-12.
6. Antkowiak B, Rammes G. GABA (A) receptor-targeted drug development-New perspectives in perioperative anesthesia. Expert opinion on drug discovery. 2019 Jul 3;14(7):683-99.
7. Nishizawa T, Suzuki H. Propofol for gastrointestinal endoscopy. United European gastroenterology journal. 2018 Jul;6(6):801-5.
8. Barends CR, Absalom A, Van Minnen B, Vissink A, Visser A. Dexmedetomidine versus midazolam in procedural sedation. A systematic review of efficacy and safety. PloS one. 2017 Jan 20;12(1):e0169525.
9. Liu SS, Wu CL. The effect of analgesic technique on postoperative patient-reported outcomes including analgesia: a systematic review. Anesthesia & Analgesia. 2007 Sep 1;105(3):789-808.
10. Peitz G, Dvoracek K, Sankaranarayanan J, Balas M, Olsen K. Awakening and Breathing Coordination, Delirium Monitoring and Early Mobility bundle in adult ICU patients: a preliminary cost analysis. Critical Care. 2014 Mar 17;18(Suppl 1):P409.
11. Herr DL, Sum-Ping SJ, England M. ICU sedation after coronary artery bypass graft surgery: dexmedetomidine-based versus propofol-based sedation regimens. Journal of cardiothoracic and vascular anesthesia. 2003 Oct 1;17(5):576-84.
12. Anger KE, Szumita PM, Baroletti SA, Labreche MJ, Fanikos J. Evaluation of dexmedetomidine versus propofol-based sedation therapy in mechanically ventilated cardiac surgery patients at a tertiary academic medical center. Critical pathways in cardiology. 2010 Dec 1;9(4):221-6.
13. Martin E, Ramsay G, Mantz J, Sum-Ping SJ. The role of the α2-adrenoceptor agonist dexmedetomidine in postsurgical sedation in the intensive care unit. Journal of Intensive Care Medicine. 2003 Jan;18(1):29-41.
14. Marik PE. Propofol: therapeutic indications and side-effects. Current pharmaceutical design. 2004 Nov 1;10(29):3639-49.
15. SEDATION P. Dexmedetomidine vs midazolam for sedation of critically ill patients. JAMA. 2009;301(5):489-99.
16. Pandharipande PP, Pun BT, Herr DL, Maze M, Girard TD, Miller RR, Shintani AK, Thompson JL, Jackson JC, Deppen SA, Stiles RA. Effect

of sedation with dexmedetomidine vs lorazepam on acute brain dysfunction in mechanically ventilated patients: the MENDS randomized controlled trial. Jama. 2007 Dec 12;298(22):2644-53.
17. Gerlach AT, Murphy CV, Dasta JF. An updated focused review of dexmedetomidine in adults. Annals of Pharmacotherapy. 2009 Dec;43(12):2064-74.
18. Roberts RJ, Barletta JF, Fong JJ, Schumaker G, Kuper PJ, Papadopoulos S, Yogaratnam D, Kendall E, Xamplas R, Gerlach AT, Szumita PM. Incidence of propofol-related infusion syndrome in critically ill adults: a prospective, multicenter study. Critical Care. 2009 Oct 29;13(5):R169.
19. Barletta JF, Miedema SL, Wiseman D, Heiser JC, McAllen KJ. Impact of dexmedetomidine on analgesic requirements in patients after cardiac surgery in a fast-track recovery room setting. Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy. 2009 Dec;29(12):1427-32.