

# In Adult Coronary Artery Bypass Graft Patients, How Does the Use of Propofol Compare with Dexmedetomidine in Affecting Extubation Times During Postoperative Hospital Stay?



Matthew Robinson, Steven Wall, Franciscan University

## Abstract

**Purpose:** A growing body of evidence suggests that early extubation protocols significantly optimize cardiac surgical patients' healthcare outcomes. This review aims to determine the efficacy of dexmedetomidine versus propofol in reducing the duration of time on mechanical ventilation and seeks to contrast their effects on hemodynamic stability in postoperative coronary artery bypass graft (CABG) surgery.

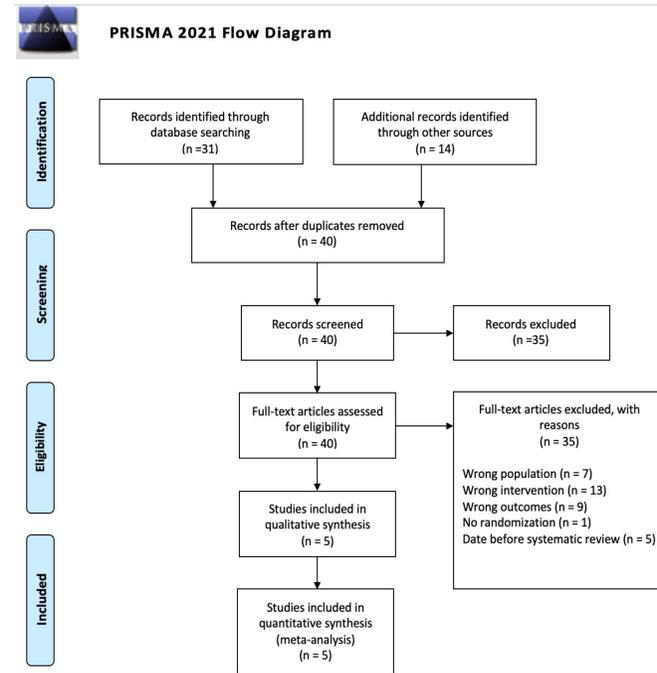
## Introduction

- Coronary artery bypass graft (CABG) surgery is the most common cardiac surgery to correct ischemic heart disease.
- However, despite the advancements in surgical techniques, postoperative complications remain significant.
- These complications include:
  - Myocardial infarction
  - Stroke
  - Reoperation
  - Death
- Adverse effects on:
  - Airway protection
  - Respiratory drive
  - Cardiovascular instability
  - Time spent on mechanical ventilation
- Appropriate choice of sedation may improve these outcomes by influencing hemodynamic stability and improving mechanical ventilation time.

## Participants

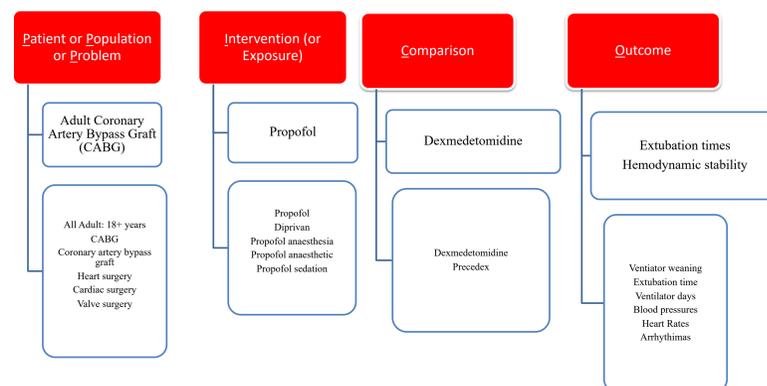
- Adults  $\geq 18$  years of age
- Any gender or ethnicity
- Patients undergoing CABG

## Materials & Methods



## PICO Search Strategy Chart

In adult coronary artery bypass graft patients, how does the use of propofol compare with dexmedetomidine in affecting extubation times during the postoperative hospital stay?



## Results

- Types of Studies (5):
  - 2 Randomized Controlled Trials (RCTs)
  - 2 Retrospective Cohort Studies
  - 1 Systematic Review and Meta-Analysis

### Dexmedetomidine reduces extubation time

- Meta-analysis of the 2 cohort studies and systematic review reveals a statistically significant decrease in time to extubation for patients receiving dexmedetomidine when compared to propofol.
  - **Chulich et al. (2019):** found that the dexmedetomidine group had an average time until extubation of 357 minutes, while the propofol group had a higher average extubation time of 425 minutes.
  - **Nguyen & Nacpil (2018):** found dexmedetomidine groups had an average of 4.18 hours shorter time to extubation compared to propofol.
  - **Zientara et al. (2019):** resulted in a mean extubation time in the dexmedetomidine group of 208 minutes, whereas the mean propofol extubation time was 307 minutes.

### Dexmedetomidine improves hemodynamic stability

- Two RCTs and a retrospective cohort study demonstrated dexmedetomidine groups to have higher mean arterial pressures (MAPs), lower heart rates, and lower incidence of postoperative atrial fibrillation.
  - **Elgebaly & Sabry (2018):** indicated that the dexmedetomidine group had lower heart rates with an average of 102.6 beats per minute (bpm) compared to propofol at an average of 109.8 bpm.
  - **Patil et al. (2021):** found that the dexmedetomidine group had an average heart rate significantly lower at 69.45 bpm when compared to the propofol group at 78.87 bpm.

## Results continued

- **Zientara et al. (2019):** reported the dexmedetomidine group had a lower occurrence of new-onset atrial fibrillation postoperatively at 8% compared to 18% for propofol.

## Conclusions

- Strengths of this systematic review include:
  - High level evidence studies
    - 1 Systematic Review
    - 2 RCTs
  - Outcomes measured showed statistical relevance ( $p < .001$ ).
- The research suggested that dexmedetomidine when compared to propofol improves extubation time and hemodynamic stability. However, this review was not able to definitively answer which agent was superior.
- Future studies are needed and should incorporate multiple institutions per study. This will both serve to increase the diversity of patient population and quality of study.

## Limitations

- Single institution studies
- Small sample sizes
- Blinding difficulty

## References

- Available upon request.