# [Operator-Directed Procedural Sedation in the Congenital Cardiac Catheterization Laboratory.](https://www.ncbi.nlm.nih.gov/pubmed/30981573)

O'Byrne ML, Millenson ME, Steven JM, Gillespie MJ, Dori Y, Glatz AC, Rome JJ.

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**Comment from Dr. Wendy Whiteside (Michigan), section editor of Congenital Heart Disease Interventions Journal Watch:**  Procedural sedation, without the use of an anesthesiologist, has historically been used commonly within the pediatric cardiac catheterization lab. More recently, however, there has been a shift towards the use of anesthesiologists in these cases, with the intention of providing improved patient safety with a dedicated provider in charge of patient sedation/anesthetic. With this transition has come an increasing use of general anesthesia (GA) in the pediatric catheterization lab. The safety of procedural sedation versus general anesthesia has not, however, been critically evaluated in this setting.

O’Byrne et al therefore present a single-center retrospective cohort study comparing the relative safety, cost, and case times of catheterization procedures performed using operator-directed sedation (ODS) compared with general anesthesia administered by a cardiac anesthesiologist. ODS consisted of either IV sedating agents or local analgesia administered by a registered nurse under the supervision of the interventional cardiologist. Over a 6.5 year period from 2011-2017, they studied 4,424 cases in 2,547 patients. Of these, 27% of cases were performed with ODS (93% performed with IV sedation and 7% with local anesthetic alone). Major adverse events (MAE) were higher in GA cases compared with ODS cases (6.6% vs 3.4%; p<0.001), a difference which remained in propensity score-adjusted models, with odds of a MAE lower in cases performed using ODS compared with GA (0.66, 95% CI 0.4-0.9, p=0.03). Applying the CRISP score retrospectively to their cases, they determined that only a minority (10.2%) of procedures using ODS would have aligned with the 2016 expert consensus recommendations and would have been appropriate to be performed without an anesthesiologist. Despite this, when the examined observed-to-expected MAE ratios for cases stratified by CRISP score and mode of sedation, they found that this deviation from recommendations was not associated with a change in the observed-to-expected ratio for MAE. Total room time, total sheath time, and room exit time (time from hemostasis to room exit) were also significantly shorter in the ODS group. Again using propensity score adjusted models, ODS was associated with decreased hospital and professional charges compared with GA with an estimated savings in hospital costs of 2017 US dollars of $2,238 per procedure.

Clearly, as the authors state, these results are certainly not meant to imply that involvement of an anesthesiologist increases the risk of a cath procedure, however they do suggest that a careful review of each individual case may be able to identify cases in whom ODS may be safe and effective and can thereby reduce resource use (both cost and case times). The safety and comfort of either of these techniques are certainly very center- and provider-specific and available resources in a particular center may very well dictate their distribution of sedation vs GA. There can be an argument made to utilizing sedation over GA in the cath lab, particularly in diagnostic cases, where free breathing with procedural sedation will provide a more accurate assessment of baseline hemodynamics. GA, however, may provide a better steady-state, with less patient movement, that may be advantageous for particular procedures, especially in light of the more complex procedures being performed in more hemodynamically vulnerable patients in current cardiac catheterization labs. While involvement of anesthesiologists has become more common in catheterization labs through the country, this should not automatically imply the use of GA. There should be careful consideration of the most appropriate sedation/anesthesia for a particular case, particularly in light of increased safety and efficiency of sedation over GA.