

# Endocarditis of the Cardiac Valves in the Era of Opioid Crisis

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# Endocarditis of the Cardiac Valves in the Era of Opioid Crisis

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## Background

- The Opioid epidemic is a very prevalent issue and intravenous drug use is one of the leading causes of infective endocarditis (IE) today
- IE and the course of the disease in IV drug users tends to differ from other patients
  - IV Drug Users: right heart, tricuspid valve, more likely to also have pneumonia, younger, less likely to need surgery
  - Non-IV Drug Users: left heart, aortic and mitral valve, more likely to also have history of CVA and/or PVD, older, more indications for surgery

## Objectives

- Analyze the demographics, medical histories, surgical results, perioperative, 30-day, and yearly outcomes of patients who underwent cardiac valve surgery for infective endocarditis
- Compare the resulting data for intravenous (IV) drug users versus non-IV drug users
- Evaluate the total hospital charges for the treatment of patients with endocarditis requiring surgery

## Method

Retrospective review of 1,302 records of LVHN patients diagnosed with IE

Narrowed down to 75 patients who underwent cardiac valve surgery for endocarditis from October 2015 – June 2019

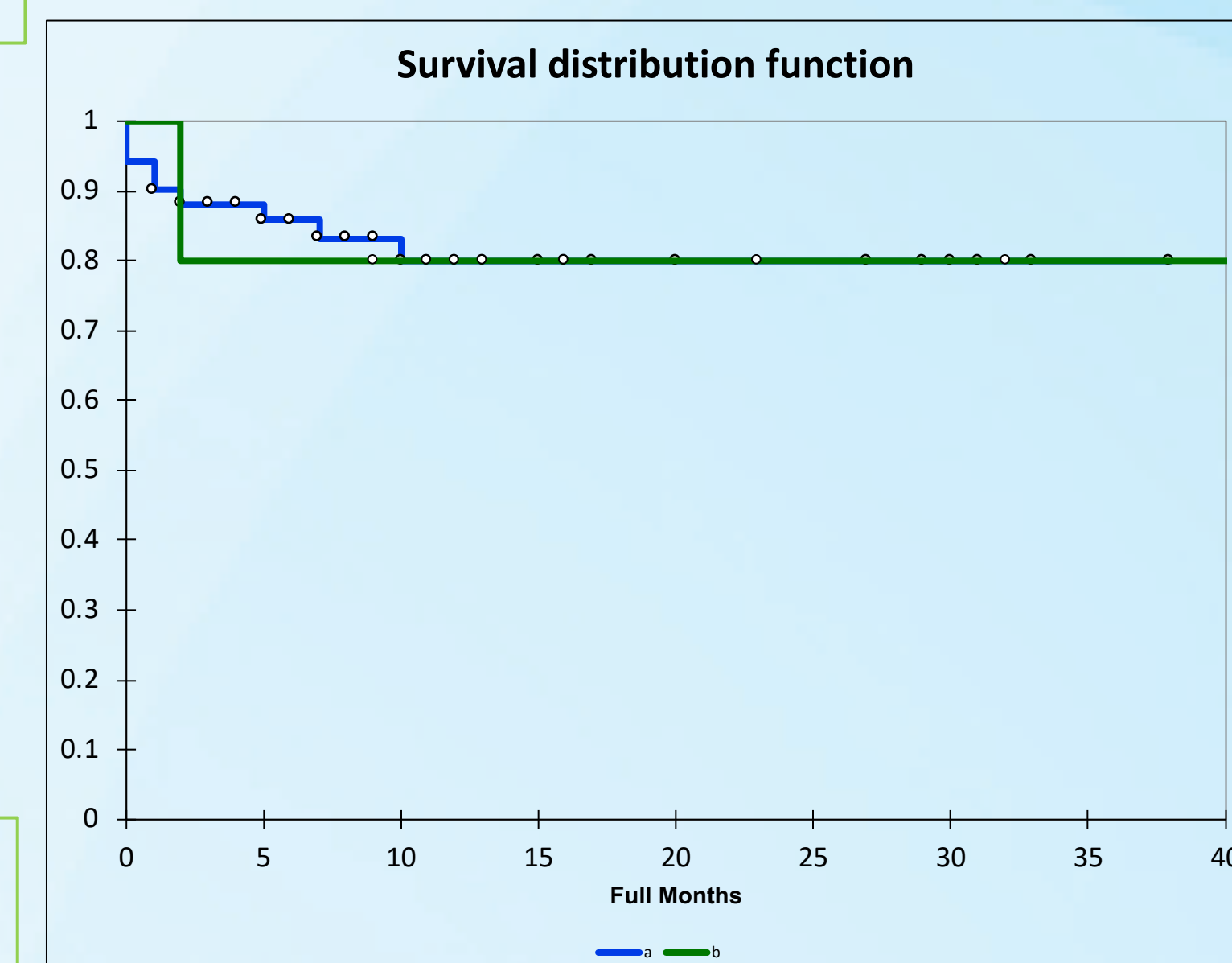
Patient data was organized into two groups: IV drug users and non-IV drug users

The results were compared; postoperative mortality and total hospital charges were the primary outcome focuses.

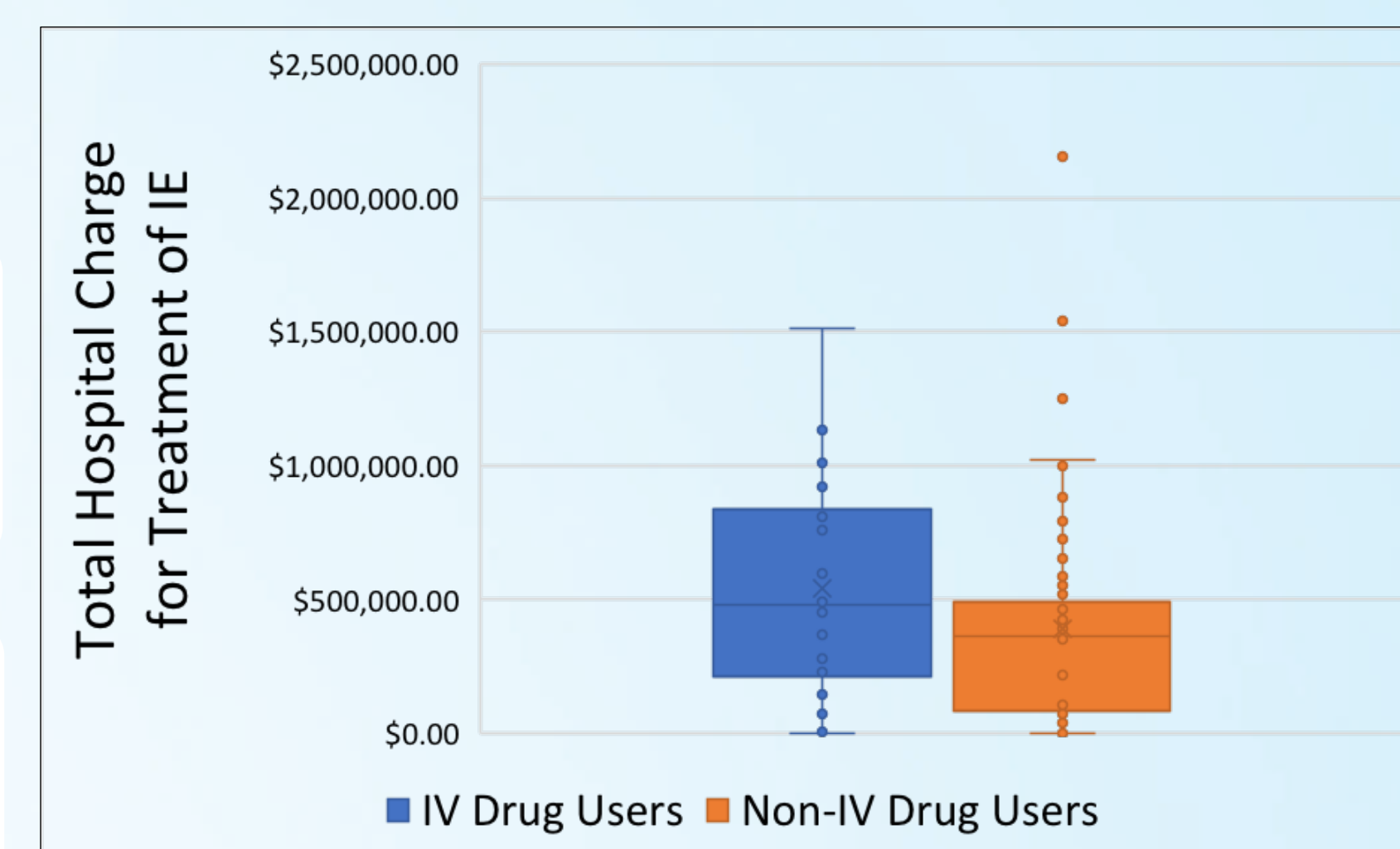
## Results

	Non-IV Drug Users n = 57		IV Drug Users n = 18	
	n	%	n	%
Age (years)	62.1±12.7		34.6±8.0	
Female	18	31.6%	9	50.0%
COPD	5	8.8%	1	5.6%
CAD	16	28.1%	0	0.0%
Diabetes	23	40.4%	0	0.0%
Chronic Renal Disease	19	33.3%	2	11.1%
PVD	10	17.5%	1	5.6%
CVA	19	33.3%	1	5.6%
Prev. Dental Surgery	5	8.8%	2	11.1%
Prev. Myocardial Infarction	9	15.8%	1	5.6%
Prev. Open Heart Surgery	16	28.1%	1	5.6%

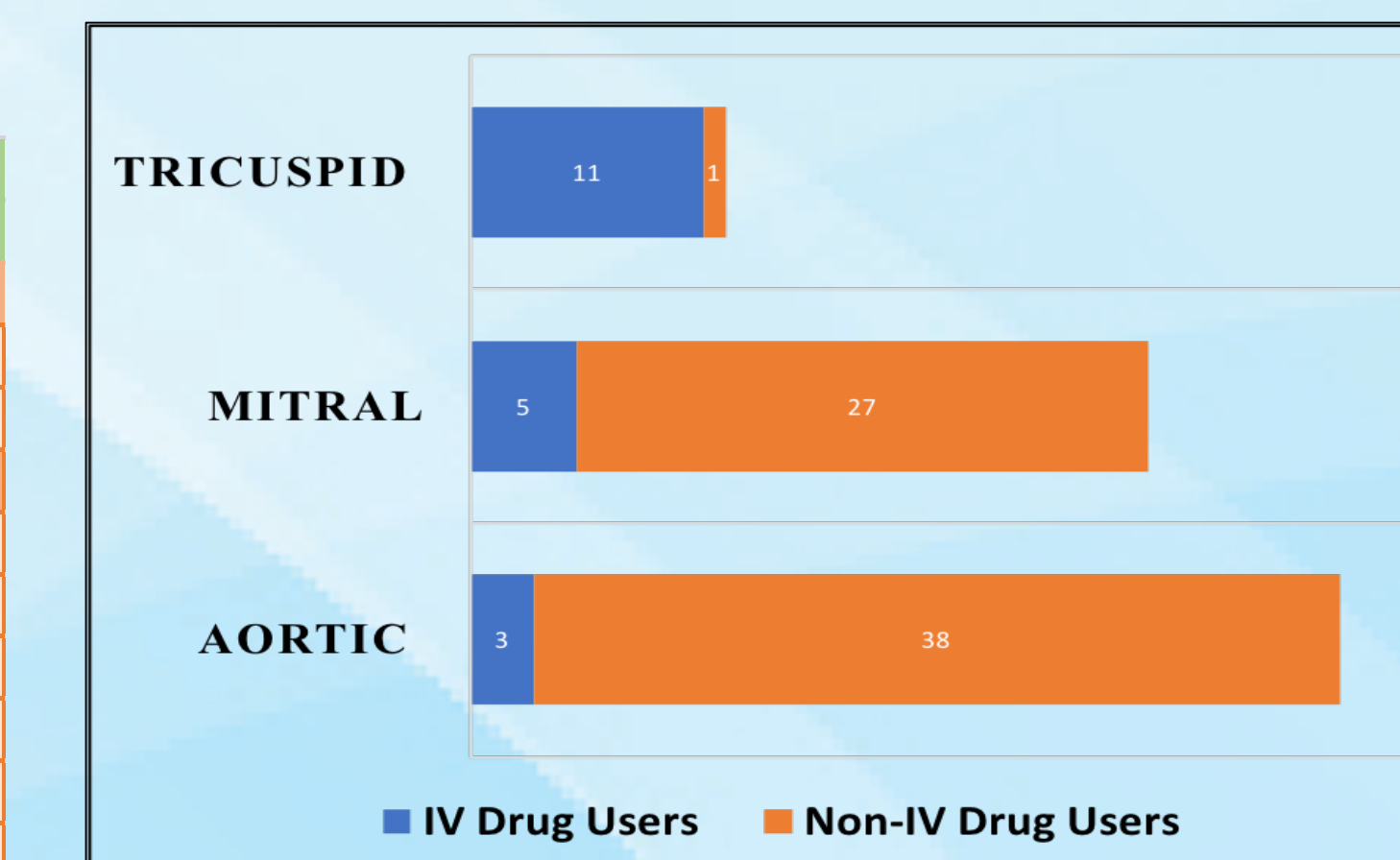
Table 1. patient demographics and medical histories



Graph 2. Kaplan Meier analysis showing the survival fraction over each full month; line a is non-IV drug users and b is IV-drug users



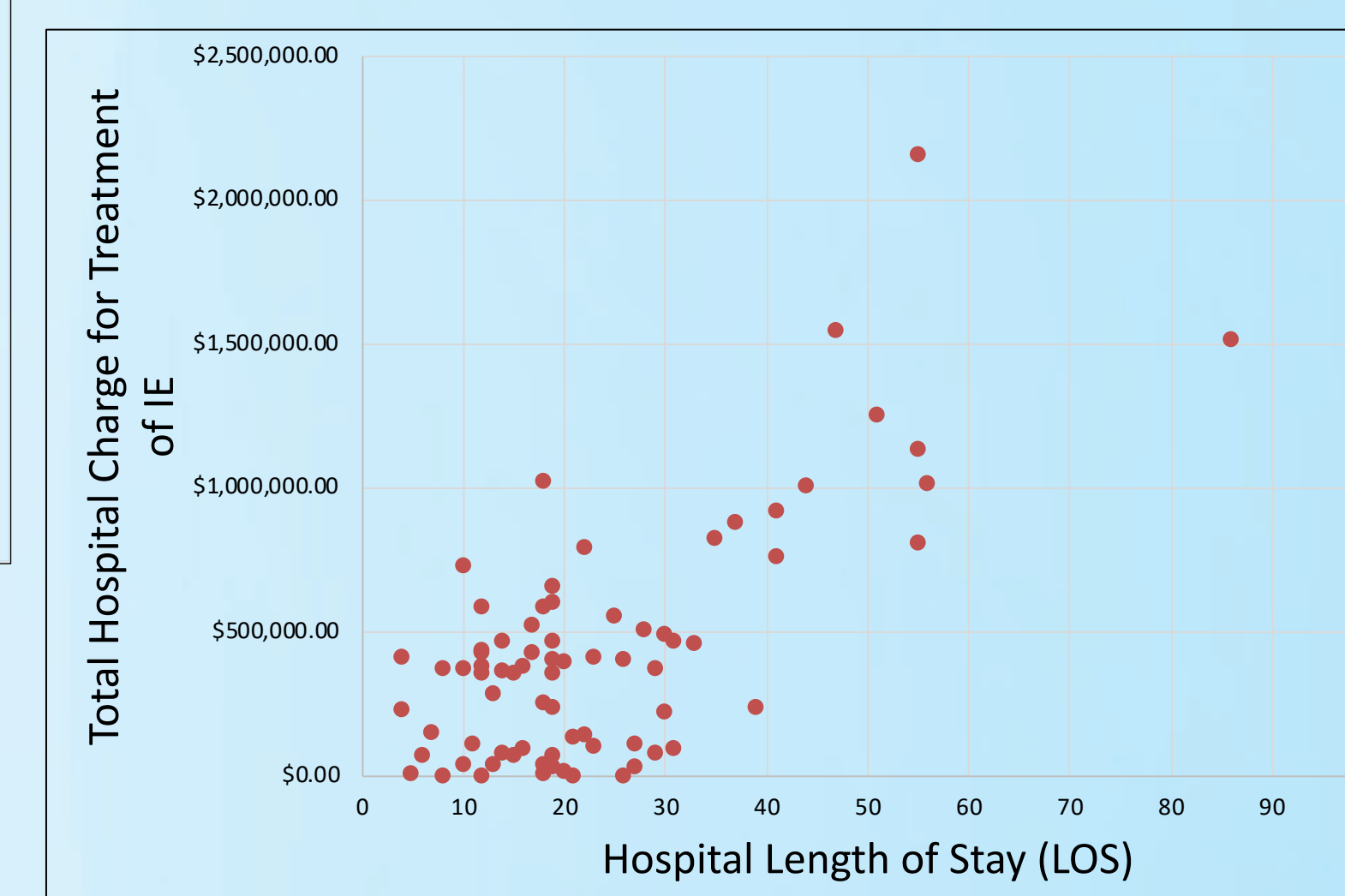
Graph 3. total hospital charges for the treatment of IE in patients from each group



Graph 1. number of IV drug user patients vs. non-IV drug user patients with IE for each valve

	Non-IV Drug Users n = 57		IV Drug Users n = 18	
	n	%	n	%
Operative				
Hypertension	26	45.6%	2	11.1%
Redo Valve Replacement	15	26.3%	1	5.6%
Perioperative				
LOS (days)	19.9±10.8		33.9±20.0	
Stroke	9	15.8%	0	0.0%
Renal Failure	7	12.3%	0	0.0%
VDRF	8	14.0%	4	22.2%
Atrial Fibrillation	11	19.3%	1	5.6%
Pacemaker	9	15.8%	6	33.3%
Ventricular Septal Defect	0	0.0%	0	0.0%
Postoperative				
Reoperation	6	10.5%	2	11.1%
Readmission at 30 Days	19	33.3%	4	22.2%
No Follow up	6	10.5%	8	44.4%
Follow up (n)	n = 51		n = 10	
Mortality	9	17.7%	2	20.0%
In-House Mortality	2	3.9%	1	10.0%
30 Day Mortality	4	7.8%	0	0.0%

Table 2. displays patient perioperative and follow-up outcomes



Graph 4. Length of stay (LOS) versus total hospital charge for each patient

## Results

- Average age of IV drug users is significantly lower than non-IV drug users (34.6 vs. 62.1)
- Bar graph shows IV drug users made up majority of patients with infection of the tricuspid valve, whereas non-IV drug users made up majority of patients with infections of the mitral and aortic valves
- Ventilator dependent respiratory failure (VDRF) and new need for a pacemaker implantation are the two most common complications researched in the IV-drug user group (22.2% and 33.3%)
- IV-drug user group had 20.0% mortality and non-IV drug user group had 17.7% mortality
- Kaplan Meier analysis shows survival drop off for IV drug user group in the first 5 months and then a plateau, whereas non-users have a more gradual drop over the first 10 months before it plateaus
- The median hospital charge for IV drug user patients is higher than non-IV drug users, but the data is less consistent in the IV drug user group
- There is a positive correlation between hospital LOS for patients and total hospital charges related to treatment of endocarditis

## Conclusion

- poor follow-up data from the IV drug user cohort makes it difficult to draw definite conclusions from the mortality data
- IV drug users are associated with a longer hospital LOS and higher total hospital charges
- Further research should include an increased sample size to help verify or reject trends in the data
- the 1,227 other patients who did not undergo surgery could be reviewed to see how their post-antibiotic treatment mortalities and hospital charges compare

## References

1. Alpert, J. S., & Klotz, S. A. (2017). Chapter 67: Infective Endocarditis. In V. Fuster, R. A. Harrington, J. Narula, & Z. J. Eapen (Eds.), *Hurst's the Heart* (14th ed., Vol. 1). McGraw-Hill. Retrieved June 17, 2019, from <http://accessmedicine.mhmedical.com/content.aspx?bookid=2046&ionid=176561493>
2. Fleischauer, A. T., PhD, Ruhl, L., MD, Rhea, S., DVM, & Barnes, E., MD. (2017). Hospitalizations for Endocarditis and Associated Health Care Costs Among Persons with Diagnosed Drug Dependence - North Carolina, 2010-2015. *Morbidity and Mortality Weekly Report*, 66(22), 569-573. Retrieved June 17, 2019, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5720243/>.