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### Clinical Outcomes for Impella Patients Associated with Hyperlipidemia: An Analysis of the National Inpatient Sample

Tony Elias  
*Rowan University*


Sonika Vatsa  
*Rowan University*

Kyrillos Gamal  
*Newark Beth Israel*

Taha Syed  
*Virtua Health*

Rafail Beshai  
*Jefferson Health New Jersey*

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# Clinical Outcomes for Impella Patients Associated with Hyperlipidemia: An Analysis of the National Inpatient Sample

Tony Elias OMS III BS, MS<sup>1</sup>, Sonika Vatsa OMS III BA<sup>1</sup>, Kyrillos Girgis MD<sup>2</sup>, Taha Syed MD<sup>3</sup>, Rafail Beshai DO<sup>4</sup>  
Rowan-Virtua School of Osteopathic Medicine<sup>1</sup>, Beth Israel Newark<sup>2</sup>, Virtua Health<sup>3</sup>, Jefferson Health New Jersey<sup>4</sup>

## Background

- Impella is a percutaneously inserted ventricular assist device that has been widely used in patients with severe heart failure complicated by cardiogenic shock.<sup>1</sup>
- There is limited data available on the impact of hyperlipidemia on Impella patients.

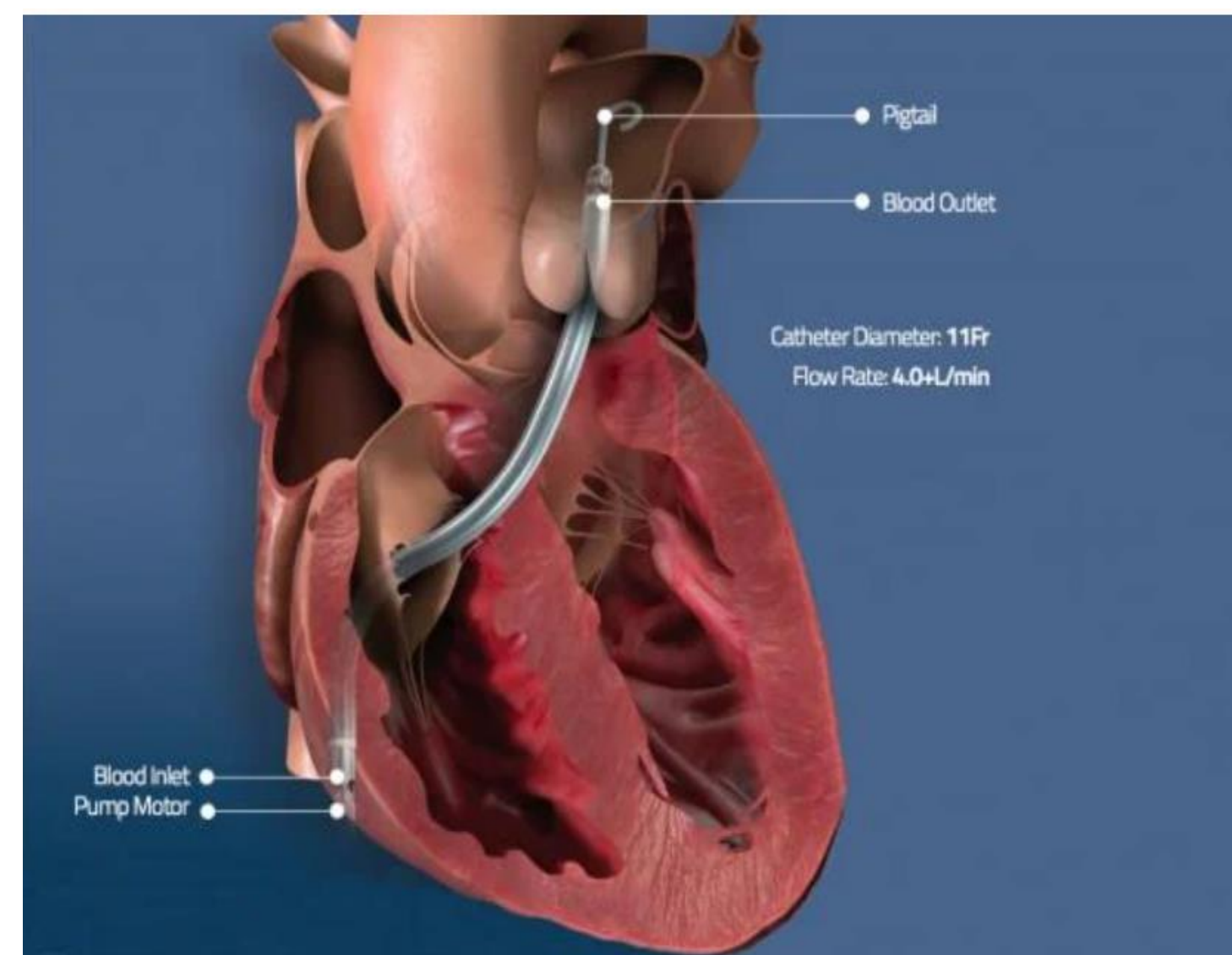
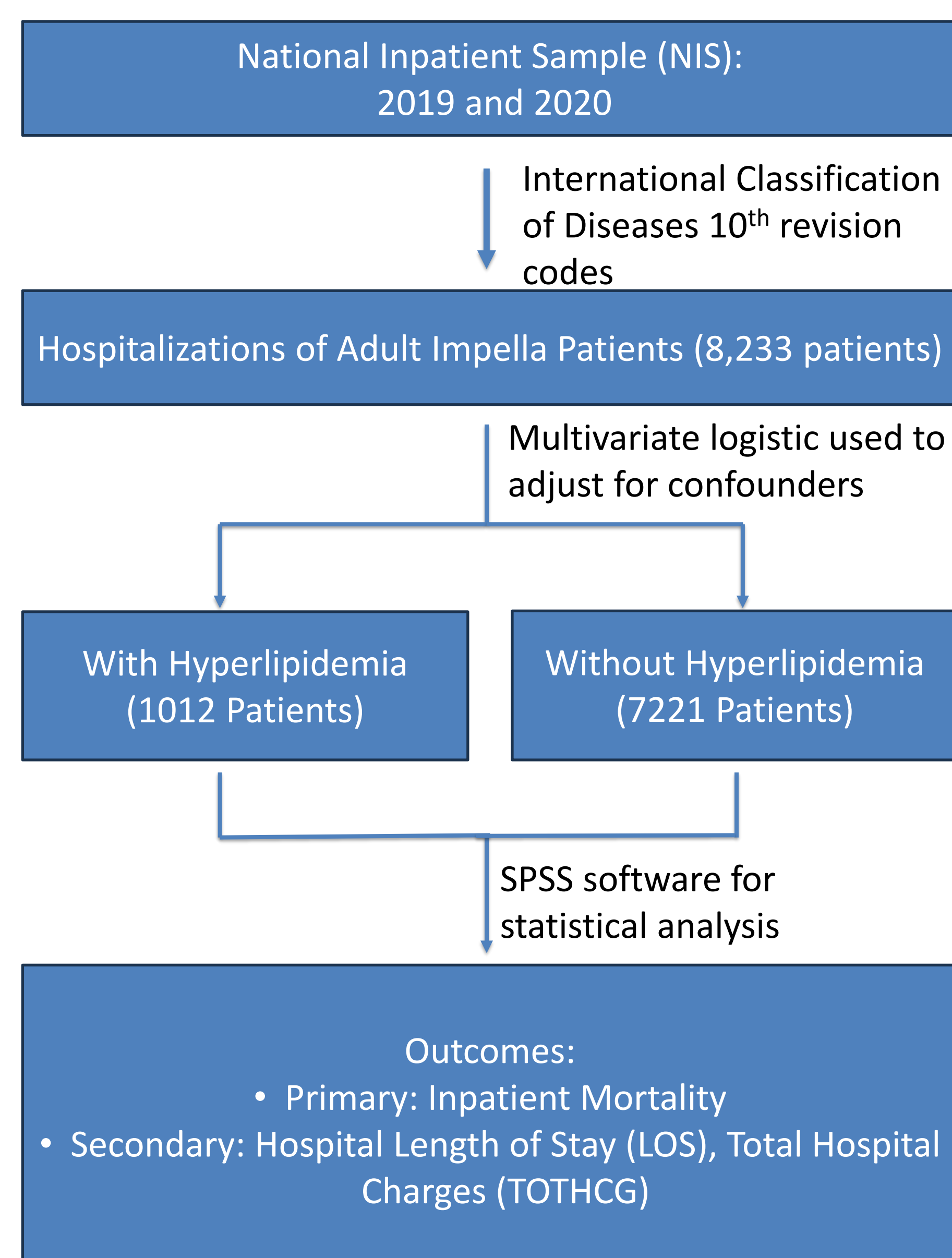


Figure 1. Venous implantation of Impella on Right side of heart.<sup>2</sup>

## Aim

- We sought to examine the national inpatient sample database to describe in-hospital outcomes among these patients.

## Methods



## Results

- This study included 8233 Impella patients, of which 1012 (12.3%) patients had hyperlipidemia.
- Impella patients with hyperlipidemia had higher prevalence of hypertension (30.2% Vs 29.1% %,  $P < 0.001$ ), diabetes mellitus (21.6% VS 15.6%  $p < 0.001$ ), and chronic kidney disease (9.1% Vs 8.0%,  $P < 0.001$ ) compared to Impella patients without hyperlipidemia. In-hospital mortality was higher among those with hyperlipidemia (7.2% VS 6.0%  $p < 0.001$ ).
- Multivariate regression showed that those patients had higher inpatient mortality (OR 1.884, 95% CI 1.815-1.954,  $P < 0.001$ ) in addition to paying significantly more total hospital charges (\$251,419 VS \$225,969,  $P < 0.001$ ). The mean length of stay (LOS) was longer among the Impella patients with hyperlipidemia (12.4 days VS 10.5 days,  $P < 0.001$ ).

- On secondary analysis it has shown that those patients had higher odds of having acute kidney failure (OR 2.008, 95% CI 1.946-2.072,  $P < 0.001$ ), ventricular arrhythmia (OR 1.913, 95% CI 1.847-1.981,  $P < 0.001$ ), stroke (OR 2.865, 95% CI 2.618-3.134,  $P < 0.001$ ), deep vein thrombosis (DVT, OR 1.689, 95% CI 1.544-1.848,  $P < 0.001$ ), and sepsis (OR 1.786, 95% CI 1.711-1.865,  $P < 0.001$ ) compared to Impella patients without hyperlipidemia.

Outcome	Hyperlipidemia (n = 1012)	No Hyperlipidemia (n = 7221)	P-value
Hypertension (%)	30.2	29.1	<0.001
Diabetes Mellitus (%)	21.6	15.6	<0.001
Chronic Kidney Disease (%)	9.1	8.0	<0.001
In-Hospital Mortality (%)	7.2	6.0	<0.001
Total Hospital Charges (\$)	\$251,419	\$225,969	<0.001
Length of Stay (days)	12.4	10.4	<0.001

Table 1. Comparison of prevalence of various outcomes in Impella patients with and without hyperlipidemia.

Outcome	Odds Ratio	95% CI	P-value
In-Hospital Mortality	1.884	(1.815 – 1.954)	<0.001
Acute Kidney Failure	2.008	(1.946 – 2.072)	<0.001
Ventricular Arrhythmia	1.913	(1.847 – 1.981)	<0.001
Stroke	2.865	(2.618 – 3.134)	<0.001
Deep Vein Thrombosis	1.689	(1.544 – 1.848)	<0.001
Sepsis	1.786	(1.711 – 1.865)	<0.001

Table 2. Associations between various conditions and hyperlipidemia among Impella patients.

## Conclusion

- In this nationally representative population-based retrospective cohort study, hyperlipidemia was associated with higher mortality and worse outcomes among Impella patients.

## References

1. Glazier, James J., and Amir Kaki. "The Impella device: historical background, clinical applications and future directions." *International Journal of Angiology* 28.02 (2019): 118-123.
2. Meraj, P. (2019, March 26). *Right Heart Hemodynamic Support With Impella RP, Getting it Right*. *Diagnostic and Interventional Cardiology*. <https://www.dicardiology.com/article/right-heart-hemodynamic-support-impella-rp-getting-it-right>