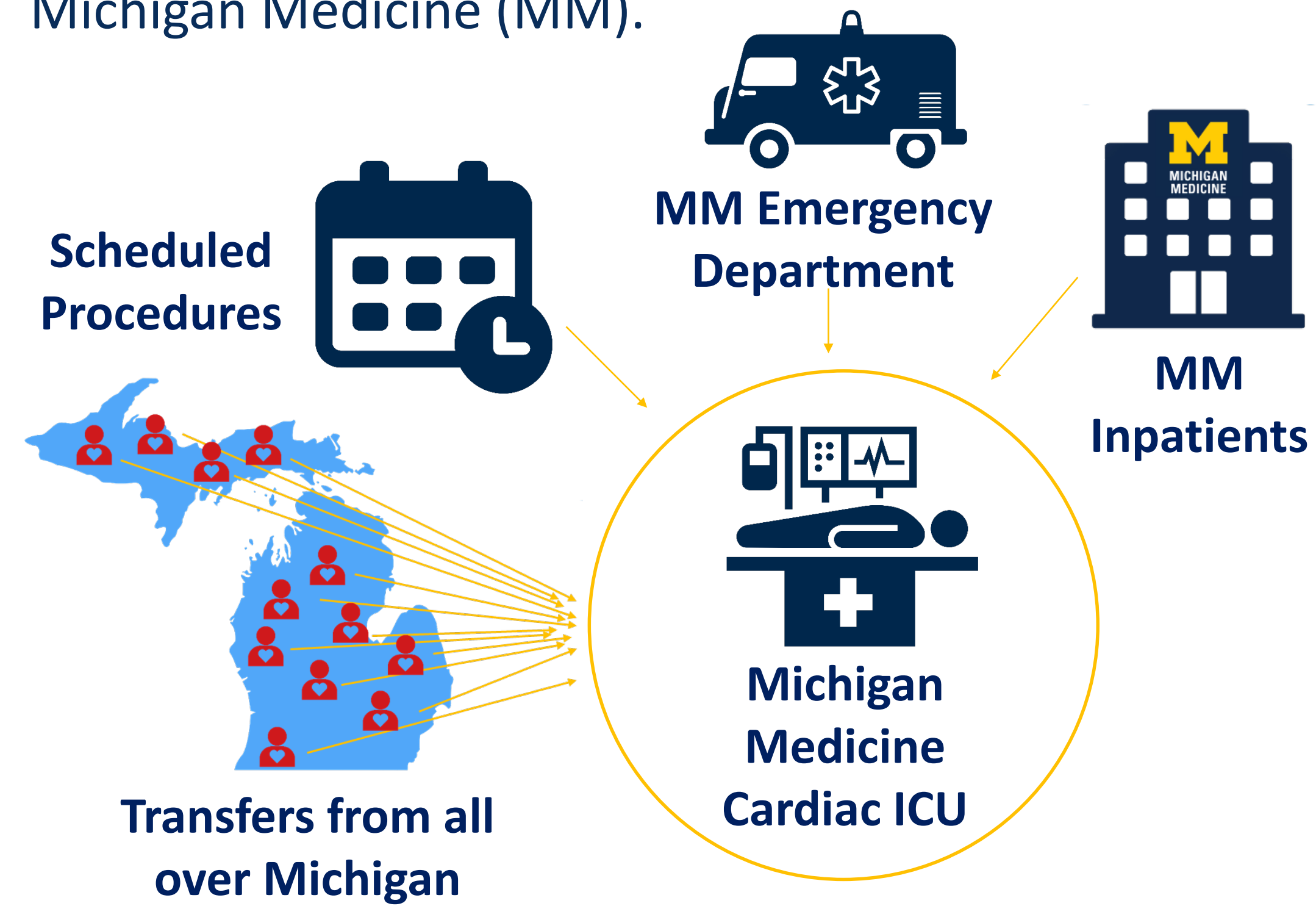


## The Problem



Cardiovascular disease is the leading cause of death in the US. Many cardiac patients require surgery.

Finite capacity, variability and unpredictability limit our ability to meet all requests for transfer from outside hospitals into the Cardiovascular Center (CVC) of Michigan Medicine (MM).



### Patient Needs



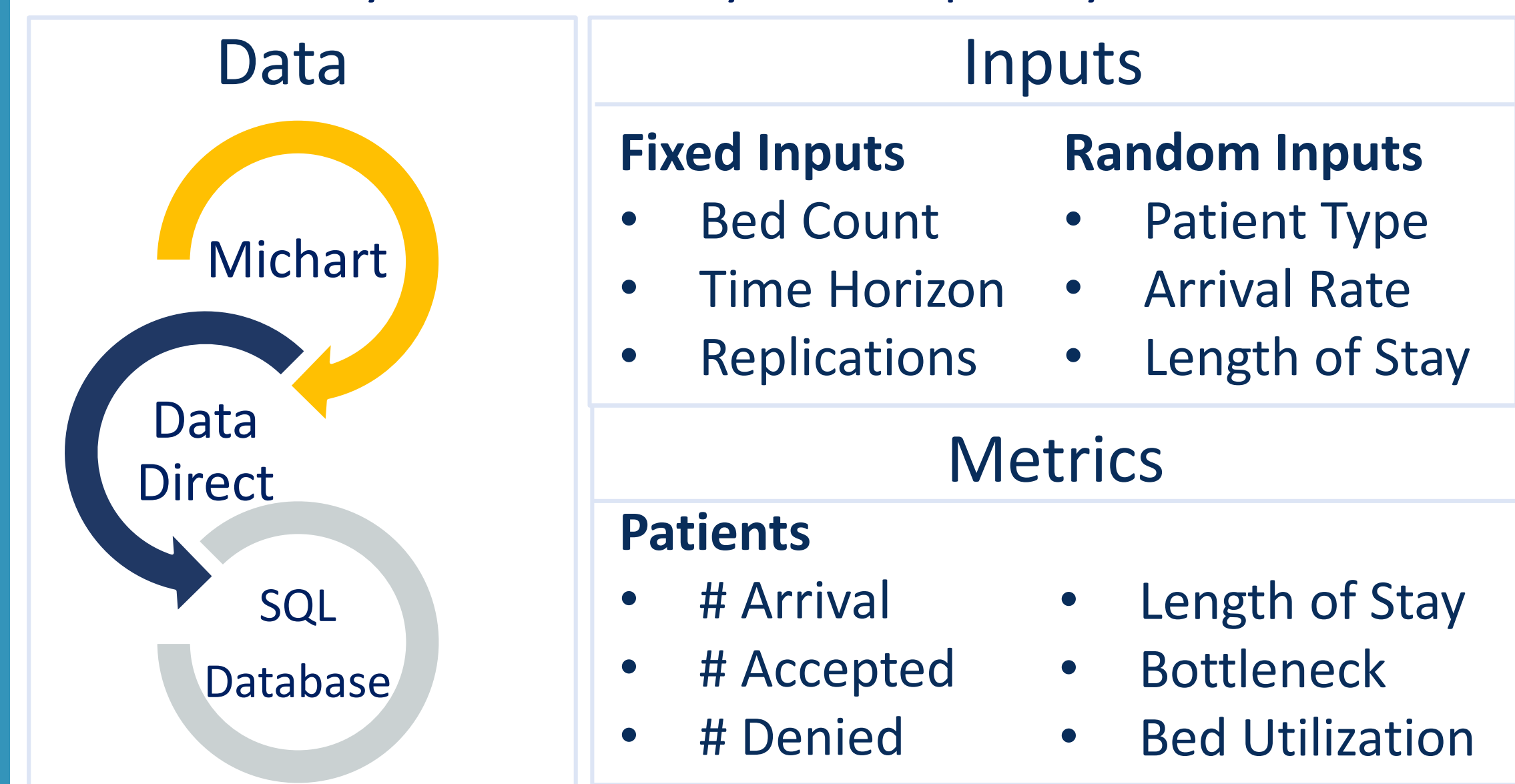
The bottleneck in providing care is often not the OR, the surgeon, or the staff, but the cardiac ICU.



By enabling policy makers to better understand how uncertainty impacts ICU utilization, we can improve access and patient care.

## The Approach

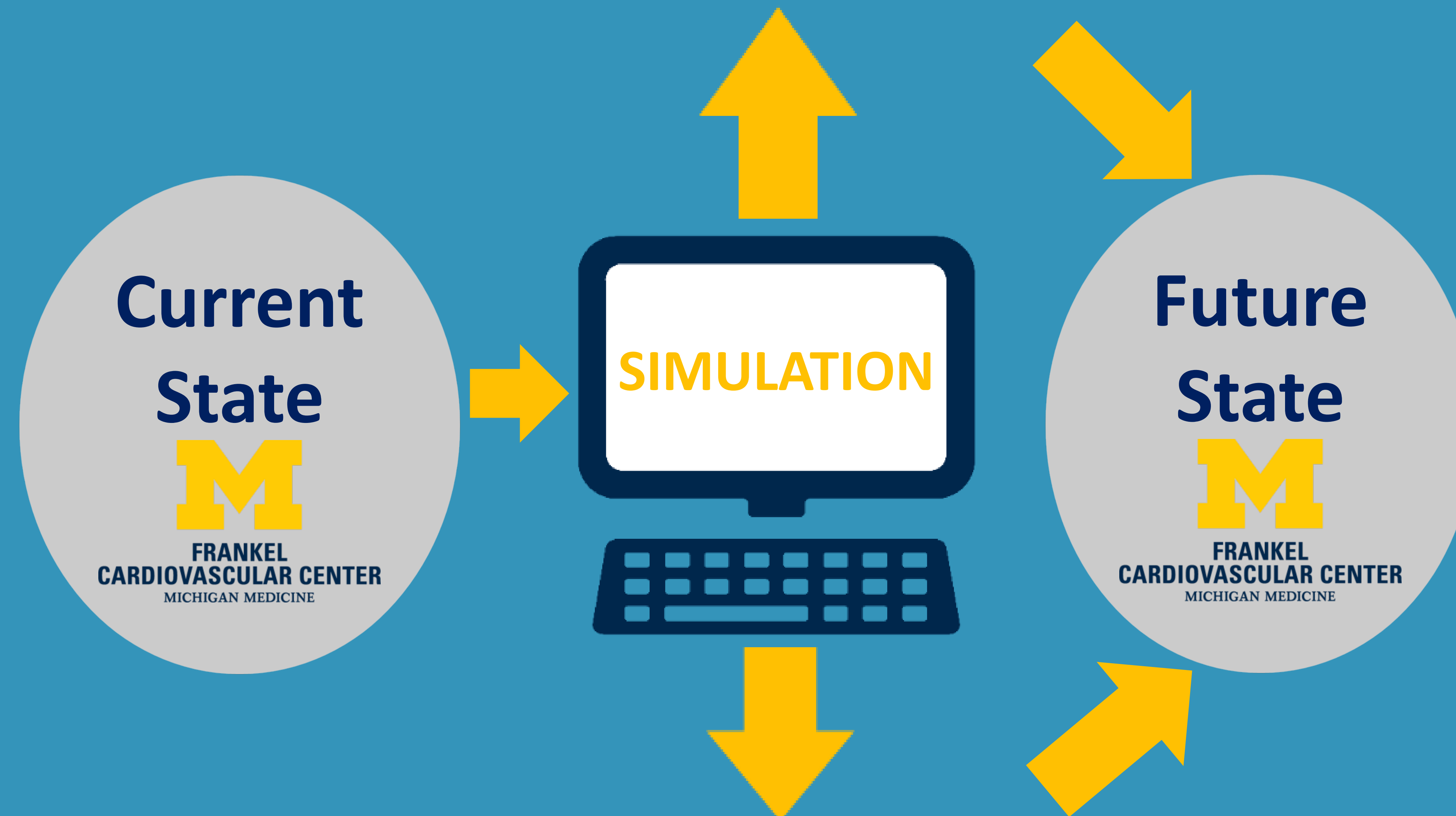
We have developed a simulation tool that enables the evaluation of the system in both current state and under proposed future policies. This tool also provides a mechanism for educating policy makers about the impacts of uncertainty and variability on complex systems.



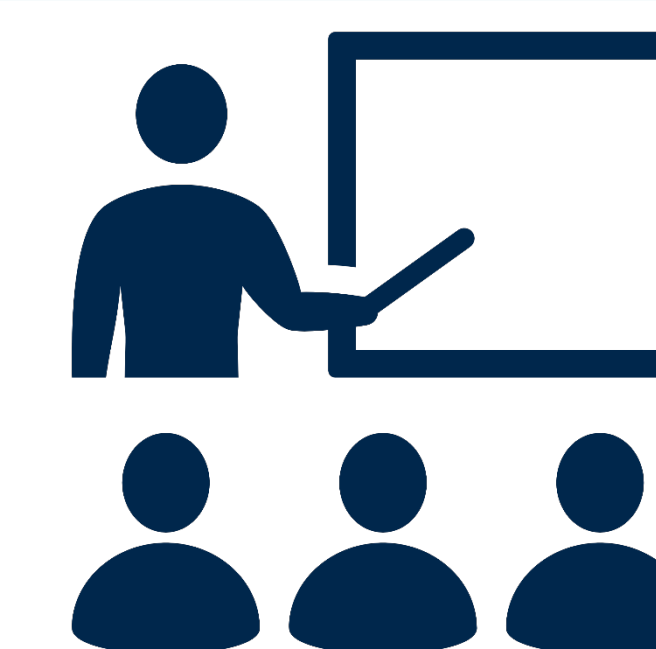
# Clearing Bottlenecks on the Road to Cardiac Intensive Care

Luke Liu, Amanda Moreno-Hernandez, Harini Pennathur, Donald Richardson, Ziqi Wang, Shuhao Zho, Prof. Amy Cohn, Dr. Hitinder Gurm

Test Policies to Increase Patients' Access to High Quality Care



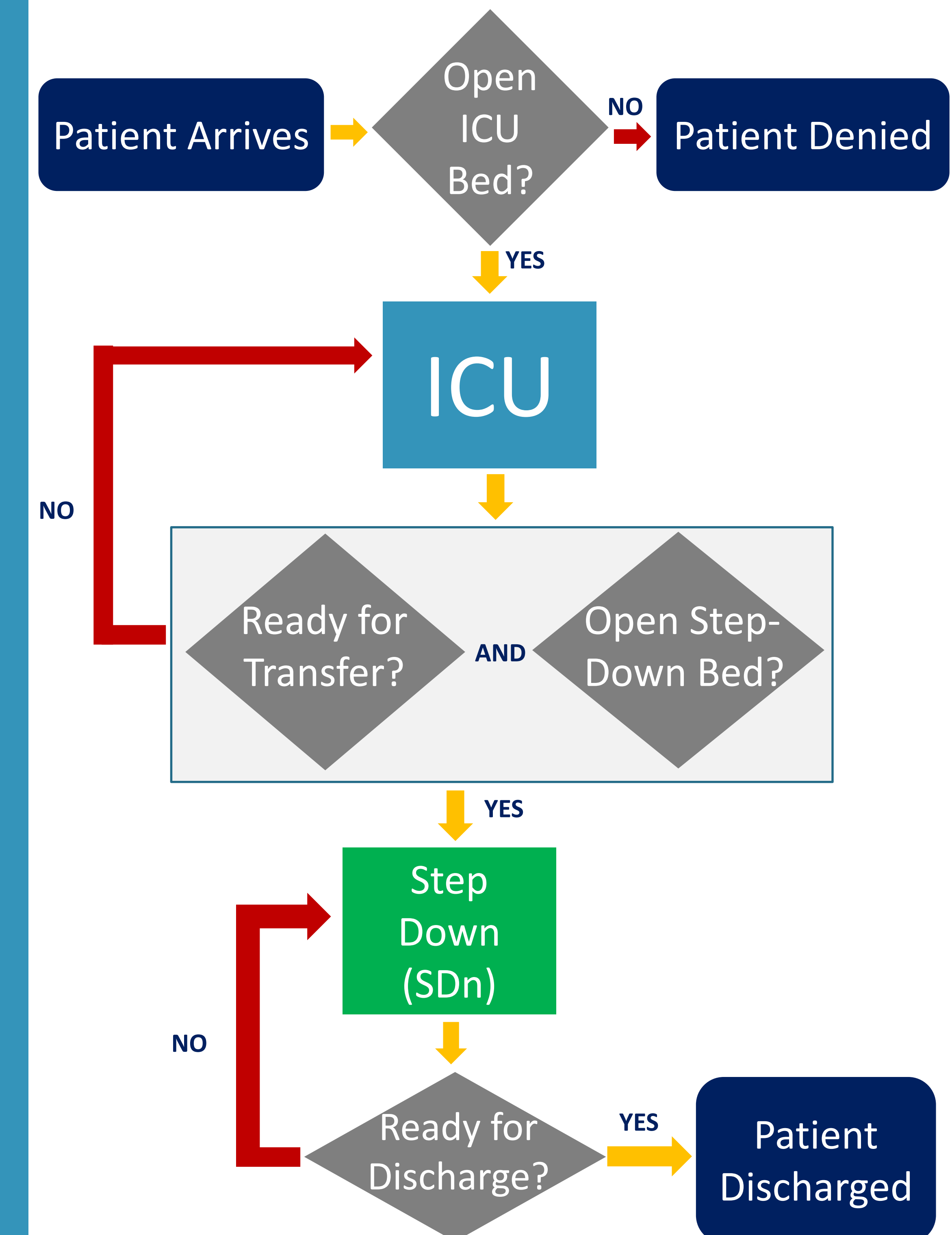
Educate Clinical Partners About Uncertainty



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ENGINEERING & PATIENT SAFETY



## Simulation: Understanding the Problem



|           |  |
|-----------|--|
| Analyses  | <p>Allows for analyses like:</p> <ul style="list-style-type: none"> <li>What is the impact of adding 4 new SDn beds?</li> <li>What happens if doctor moves time of scheduled surgery?</li> <li>How would 50% increase in elective surgery impact declines on transfer requests?</li> </ul> |
| Takeaways | <ul style="list-style-type: none"> <li>The declined outside transfer and internal transfer bottleneck is not a function of dedicated SDn beds.</li> <li>Increase in internal transfer bottleneck suggests evaluation of the internal patient flow prior to arrival at the ICU.</li> </ul>  |

## Acknowledgements



And all prior CHEPS students who have contributed to this work!