

# Implementation of the NuBOOM® Visualization & Equipment Management System: Quantitative Impact on Operating Room Efficiency and Surgeon Utilization in a Large Academic Medical Center.

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## Study Description

A 4-month pre and post installation study of selected financial, efficiency and utilization measures following installation of the NuBOOM Visualization and Equipment Management System in an outpatient surgery OR of Oregon Health & Science University.

## Key Results

- A 5.2% increase in the average number of surgical cases per day
- Increased average monthly OR revenues of \$36,437 in this OR, equivalent to adding 1.5 more surgical days per month
- An 18% increase in the number of different surgeons utilizing the OR

## Introduction

Updating operating room (OR) infrastructure to keep pace with the demand for minimally invasive surgery (MIS) procedures while optimizing team efficiency, productivity, and safety in the OR is a challenge for management and staff. An important aspect of evaluating post implementation project success is to measure the quantitative impact of new solutions implementation, particularly when these projects require integration of diverse technologies that must function seamlessly and deliver a demonstrable return on investment (ROI). The specific goals of this project were to assess selected quantitative indicators of improved OR efficiency and utilization after an MIS OR upgrade in an older, high-use, facility, within targeted financial and operational outcomes measures.

## Material and methods

In November 2005, a NuBOOM Visualization & Equipment Management System [CompView Medical, Beaverton, OR] was installed in a mixed-use, 550 square foot Endourology-General Surgery OR in the DayStay Unit of Oregon Health & Science University (OHSU). OHSU is a 560-bed academic healthcare and research facility located in Portland, Oregon. OHSU Surgical Services supports over 25,000 acute and ambulatory surgical cases annually. The NuBOOM System was selected after a thorough due diligence review of



available technologies for MIS suite upgrades. Important department criteria contributing to NuBOOM System selection included the desire to improve safety by reducing mobile video cart clutter and enhance physical monitor-viewing ergonomics, as well as the System's cost-efficiency features. These included the availability of a weekend installation that eliminated OR downtime, the ability to fit within the existing OR physical infrastructure (small room, low ceilings) and without construction or structural renovation requirements.

The NuBOOM System is a fully-contained MIS OR upgrade solution designed to house existing medical devices and video equipment and position up to four HD (High Definition) monitors around the surgical field by means of two pedestal-based, articulating boom arms. The video integration features of the NuBOOM System include an icon-based, touch panel

interface for video image and information routing and display. The NuBOOM System was installed in 2 days over a weekend, eliminating OR downtime. The OHSU DayStay surgical staff received inservice training early Monday morning, avoiding interruption to the normal surgical schedule.

Selected perioperative efficiency and utilization data was collected for four months prior to the installation of the NuBOOM System (Pre NuBOOM Installation Period: July – October 2005), and compared with four months of post-installation data (Post NuBOOM Installation Period: November 2005 – February 2006).

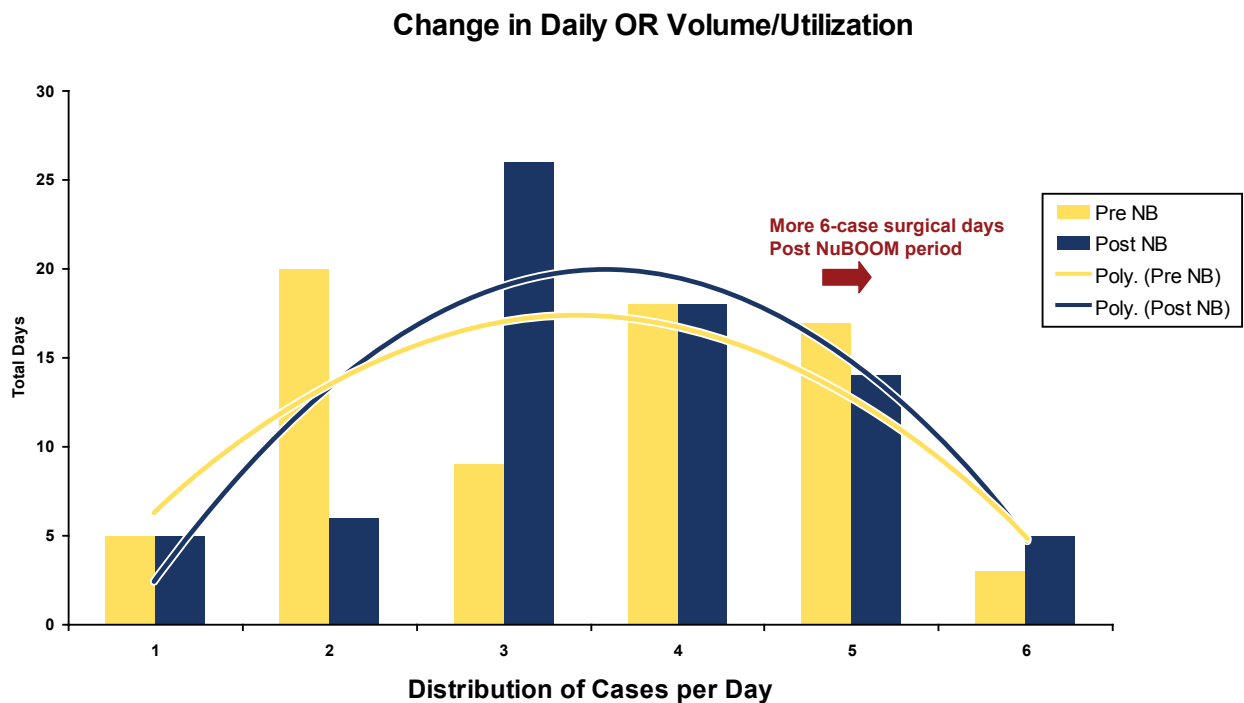
Data analysis included measurement of Pre and Post NuBOOM Installation Period changes in:

- Average number of OR cases per day
- Average number of OR cases per day for selected surgeons
- Total number of surgeons utilizing the Endourology MIS operating room
- Average increase in OR billable charges (OR revenues) per month

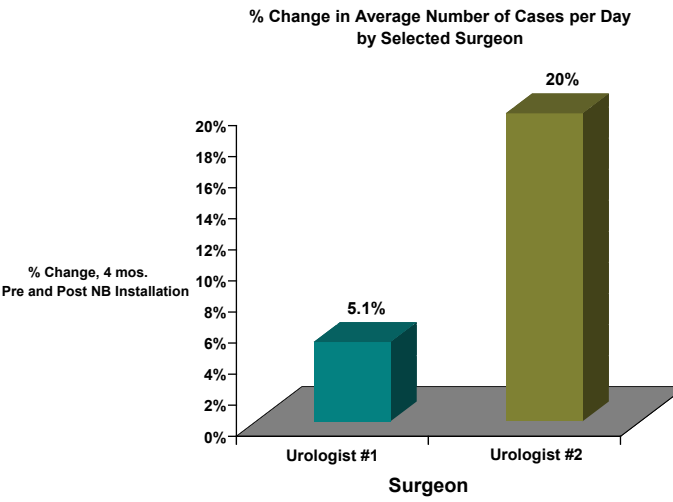
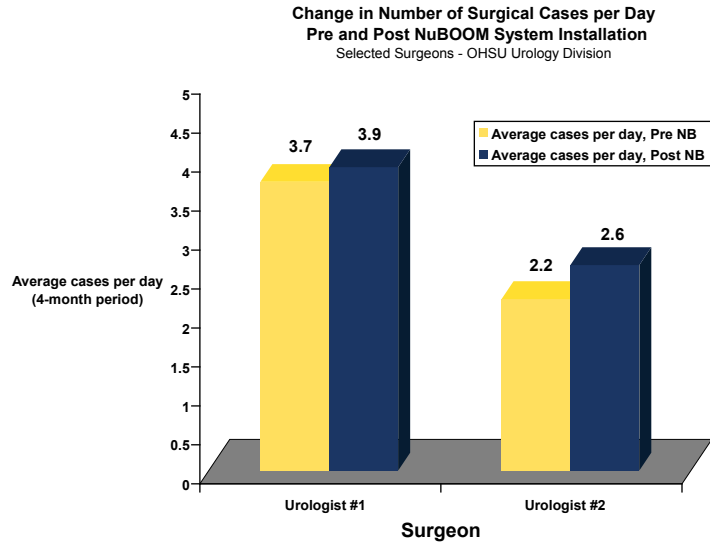
Study limitations included the inability to control for changes in surgical staff, scheduling anomalies, case mix and any administrative changes. No staffing, utilization, or policy changes were implemented during the assessed time during either the Pre or Post NuBOOM Installation Periods that would have material impact on the observed outcomes.

## Results

- Following installation, there was a 5.2% increase in the average number of surgical cases, from 3.4 to 3.6 cases per day, in this OR. This resulted in an average of 5 more cases per month during the Post NuBOOM Installation Period measured.



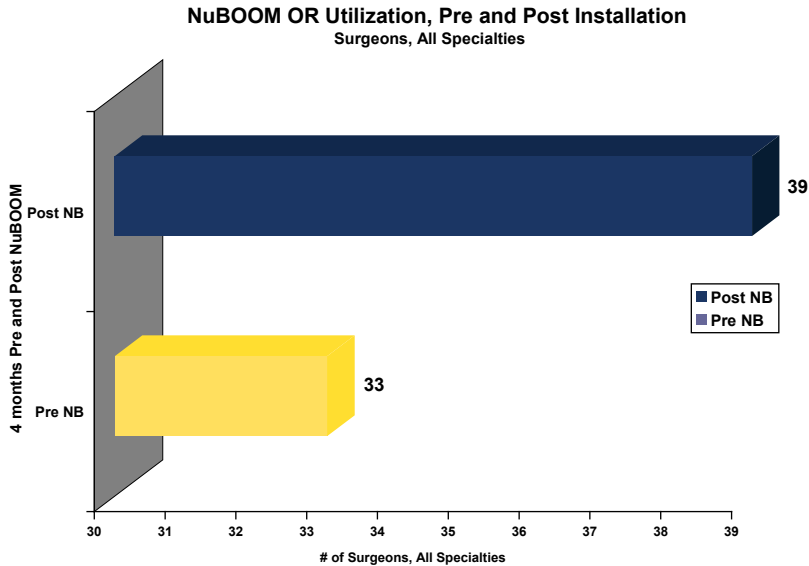
- The surgeon (urologist) with the highest historical case volume in this OR demonstrated a net increase of 5.1% in the average number of cases per month. There was a 20% increase in the average number of cases for the second highest volume surgeon (urologist) utilizing the upgraded OR.



- There was a 15% increase in all Urology Service cases between Pre and Post NuBOOM Installation Periods.
- Orthopedics, vascular, pain and gastroenterology subspecialties experienced a modest increase in the number of surgeries performed in this OR.

- There was an 18% increase in the number of different surgeons using the OR, from 33 Pre NuBOOM to 39 Post NuBOOM surgeons.
- Reduction in OR turnaround time of 10-15 minutes per patient was observed anecdotally by OR management, although collected data was insufficient to validate this observation.

Overall, the NuBOOM OR average monthly revenues increased by \$36,437. This is equivalent, based on this specific OR's average daily billable charges history, to adding 1.5 more surgical days per month.



## Conclusion

Avoidance of OR structural renovation and OR downtime, as well as other structural, budgetary and efficiency concerns were important factors in the project decision making process. Installation of the NuBOOM Visualization and Equipment Management System converted an older general OR into an, integrated, minimally invasive surgery (MIS) surgical suite for the OHSU Endourology Service. It also increased utilization of this OR by other MIS specialties.

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"The main thing I like about NuBOOM is we no longer have cords strewn all over the floor. We don't have electrical cords all over, we don't have our lithotrite cord all over, we don't have our fluoroscopy cords all over the floor. Nobody's tripping and falling all over this stuff as we're working and that's a huge safety advantage, as well just practical."

*Dr. Eugene Fuchs, MD Professor  
Surgery/Urology, Oregon Health  
Sciences University, Portland, OR*

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There was a substantial increase in the monthly OR revenue generated following implementation of the system. No OR downtime was incurred, which resulted in significant additional measurable savings to this institution. Therefore, project implementation yielded an overall demonstrated positive ROI. This is in addition to the qualitative benefits communicated by the surgical team, including increased surgeon and staff physical comfort due to improved monitor viewing ergonomics and greater efficiency due to dedicated equipment availability. Increased team safety was also observed as a result of reducing trip hazards due to cable and cart floor clutter, as well less physical strain by significantly reducing the need to move heavy equipment carts.

## Acknowledgments

*The author gratefully acknowledges the research assistance provided by the Oregon Health & Science University Department of Perioperative Services. The views, opinions and/or findings contained in this report are those of the author and should not be construed as an official policy, position or decision of Oregon Health & Science University. The author reports no personal disclosures or conflicts of interest relevant to this publication.*

*This work was supported, in part, by a Value Added Partnership agreement that exists between Oregon Health & Science University and CompView Medical (Beaverton, OR). Neither party discloses any other intellectual property, ownership or financial arrangements deemed to constitute an actual or potential conflict of interest.*



## About the Author

Margaret Montgomery, RN, MBA, has over 35 years of experience as a Registered Nurse and currently serves as Division Director, Perioperative Services for OHSU where she manages over 350 employees, operating annual budgets in excess of \$45 M and has designed and opened several fully integrated MIS operating rooms. Prior to her tenure at OHSU, she has held positions as Director of Surgery and Nurse Manager with Harborview Medical Center, Everett General Hospital, Northwest Hospital and Hayward Vesper Hospital. Melody holds a Bachelor of Nursing degree from the Merritt Hospital, School of Nursing, a Masters of Business Administration degree from the University of Washington and has been Board Certified in Perioperative Nursing, CNOR.



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