

# Innovations in Surgical Technology:

Shaping the Future of  
Perioperative Care



## Introduction



Dr. Eboni Saurage, EdD, MS, BSHSc, ASST, CST, FAST

Certified Surgical Technologist

Educator

Volunteer Leader for regional and national levels  
of surgical technology professional organization  
- Association of Surgical Technology (AST)

Director Accreditation Review Council on  
Education in Surgical Technology and Surgical  
Assisting Board (ARC/STSA)

# Introduction



The purpose of this presentation is to discuss the impact of the surgical technologist in the perioperative setting and encourage collaboration within the interprofessional team to ensure the best possible outcomes for patients in the evolving landscape of perioperative care. We'll talk about innovations like robotic surgery and advanced imaging, discuss how they make surgery safer and explain how the role of the surgical technologist can make incorporating these innovations easier for the team and safer for the patient.

# Introduction

Brief Overview of the Importance of Surgical Technology in Perioperative Care



International Museum of Surgical Science: The Operating Room: Surgical Technology Then and Now



# International Museum of Surgical Science



[IMSS Surgical Technology Then and Now Exhibition Tour](#)





## Historical Perspective of Surgical Technology

Evolution of Surgical Tools and Techniques

Milestones in Surgical Innovation

Impact on Perioperative Care

### Timeline of progress in surgical robots

- 1970s** NASA explores telesurgery.
- 1983** First robot in the surgical suite, used to move patient's limbs into position during orthopedic surgery.  

- 1985** First instance of a surgical robot, used during brain biopsy to avoid errors from hand tremors.  

- 1985** First laparoscopic procedure.  

- 1990s** Laparoscopic surgery becomes more common, many novel procedures carried out and many new systems invented.
- 1991** First telepresence system, means surgeons don't need to be directly next to patient.
- 1992** First robot with task autonomy gets FDA approval. Used in hip replacement, ROBODOC can carry out certain pre-programmed tasks autonomously once initiated by a human.  


# Historical Perspective of Surgical Technology

## Evolution of Surgical Tools and Techniques

## Milestones in Surgical Innovation

## Impact on Perioperative Care

- 2000s** Surgical robots for general use become more common.
- 2000** Introduction of da Vinci, the first robotic system for general and laparoscopic surgery in humans.
- 2001** Doctors in New York City use telesurgery to operate on a patient in France.
- 2001** First robot with conditional autonomy gets FDA approval. Used in radiation therapy, CyberKnife can perform procedure autonomously.
- 2001–present** Refinement of existing surgical robots continues to expand, robots become smaller, lighter, easier to use, and offer more assistance features for surgeons.
- 2009** Steerable catheters to access and operate constrained regions not reachable with rigid laparoscopy.
- 2022** STAR robot successfully sutures severed pig intestine.
- The future** Surgical robots gradually acquire increasing autonomy.

SOURCE: REPORTING BY J. GAINES

KNOWABLE MAGAZINE

# Current Challenges in Perioperative Care

## Patient Safety

## Efficiency and Cost Challenges

## Incorporating Evidence Based Practices

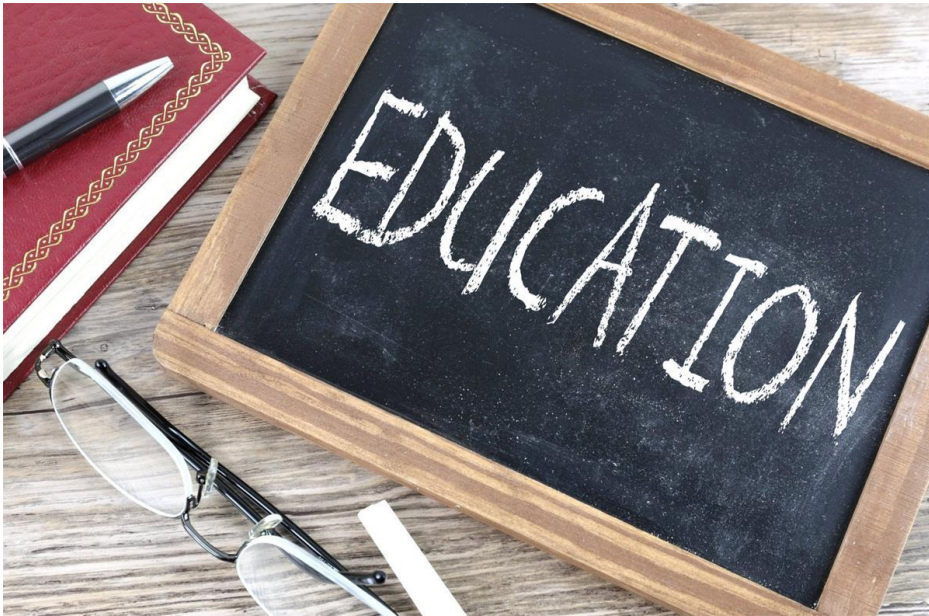
## Development of the Synergistic Team

World Health Organization		
SURGICAL SAFETY CHECKLIST (FIRST EDITION)		
Before induction of anaesthesia	Before skin incision	Before patient leaves operating room
<b>SIGN IN</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> PATIENT HAS CONFIRMED                             <ul style="list-style-type: none"> <li>• IDENTITY</li> <li>• SITE</li> <li>• PROCEDURE</li> <li>• CONSENT</li> </ul> </li> <li><input type="checkbox"/> SITE MARKED/NOT APPLICABLE</li> <li><input type="checkbox"/> ANAESTHESIA SAFETY CHECK COMPLETED</li> <li><input type="checkbox"/> PULSE OXIMETER ON PATIENT AND FUNCTIONING</li> </ul> <b>DOES PATIENT HAVE A:</b> <ul style="list-style-type: none"> <li><b>KNOWN ALLERGY?</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> NO</li> <li><input type="checkbox"/> YES</li> </ul> </li> <li><b>DIFFICULT AIRWAY/ASPIRATION RISK?</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> NO</li> <li><input type="checkbox"/> YES, AND EQUIPMENT/ASSISTANCE AVAILABLE</li> </ul> </li> <li><b>RISK OF &gt;500ML BLOOD LOSS (7ML/KG IN CHILDREN)?</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> NO</li> <li><input type="checkbox"/> YES, AND ADEQUATE INTRAVENOUS ACCESS AND FLUIDS PLANNED</li> </ul> </li> </ul>	<b>TIME OUT</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> CONFIRM ALL TEAM MEMBERS HAVE INTRODUCED THEMSELVES BY NAME AND ROLE</li> <li><input type="checkbox"/> SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE VERBALLY CONFIRM                             <ul style="list-style-type: none"> <li>• PATIENT</li> <li>• SITE</li> <li>• PROCEDURE</li> </ul> </li> </ul> <b>ANTICIPATED CRITICAL EVENTS</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> SURGEON REVIEWS: WHAT ARE THE CRITICAL OR UNEXPECTED STEPS, OPERATIVE DURATION, ANTICIPATED BLOOD LOSS?</li> <li><input type="checkbox"/> ANAESTHESIA TEAM REVIEWS: ARE THERE ANY PATIENT-SPECIFIC CONCERNS?</li> <li><input type="checkbox"/> NURSING TEAM REVIEWS: HAS STERILITY (INCLUDING INDICATOR RESULTS) BEEN CONFIRMED? ARE THERE EQUIPMENT ISSUES OR ANY CONCERNS?</li> </ul> <b>HAS ANTIBIOTIC PROPHYLAXIS BEEN GIVEN WITHIN THE LAST 60 MINUTES?</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> YES</li> <li><input type="checkbox"/> NOT APPLICABLE</li> </ul> <b>IS ESSENTIAL IMAGING DISPLAYED?</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> YES</li> <li><input type="checkbox"/> NOT APPLICABLE</li> </ul>	<b>SIGN OUT</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> NURSE VERBALLY CONFIRMS WITH THE TEAM:                             <ul style="list-style-type: none"> <li><input type="checkbox"/> THE NAME OF THE PROCEDURE RECORDED</li> <li><input type="checkbox"/> THAT INSTRUMENT, SPONGE AND NEEDLE COUNTS ARE CORRECT (OR NOT APPLICABLE)</li> <li><input type="checkbox"/> HOW THE SPECIMEN IS LABELLED (INCLUDING PATIENT NAME)</li> <li><input type="checkbox"/> WHETHER THERE ARE ANY EQUIPMENT PROBLEMS TO BE ADDRESSED</li> </ul> </li> <li><input type="checkbox"/> SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE REVIEW THE KEY CONCERNS FOR RECOVERY AND MANAGEMENT OF THIS PATIENT</li> </ul>

THIS CHECKLIST IS NOT INTENDED TO BE COMPREHENSIVE. ADDITIONS AND MODIFICATIONS TO FIT LOCAL PRACTICE ARE ENCOURAGED.



## Current Challenges in Perioperative Care



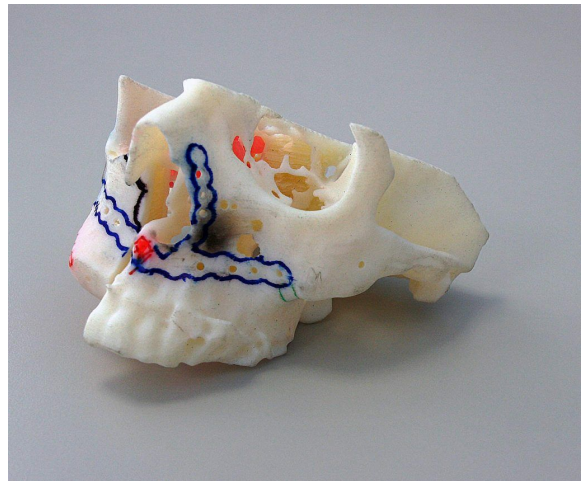
## Future Trends and Predictions

Artificial Intelligence in Preoperative Planning

Predictive Analytics

Imaging Analysis

3D Printing in Surgical Planning and Simulation Training



## Future Trends and Predictions

Virtual Reality and Augmented Reality in Surgical Education

Telemedicine in Perioperative Consultations

Integration of Big Data Analytics



surgicalscience

incision

 SIGHT MEDICAL™

## Wrap-UP

A. Summary of Key Points

B. The Ongoing Evolution of Surgical Technology

C. The Promise of a Bright Future for Perioperative Care

ANY  
QUESTIONS?



Thank You for Joining!



Dr. Eboni Saurage, EdD, MS,  
CST, FAST

Assistant Professor, Surgical Technology and  
Sterile Processing Technician  
Baton Rouge Community College  
Baton Rouge, Louisiana US

[sauragee@mybrcc.edu](mailto:sauragee@mybrcc.edu)



## Resource Links:

[The Association of Surgical Technology](#)

[The Accreditation Review Council for Education in Surgical Technology](#)

[National Board of Surgical Technology and Surgical Assisting](#)

[National Center for for Competency Testing - Tech in Surgery-Certification](#)

[Association of periOperative Registered Nurses](#)

[Surgical Science](#)

[Incision Academy / Incision Assist](#)

[McCartney. \(2023\) AI is Poised to “Revolutionize” Surgery](#)