EXECUTIVE SUMMARY

BACKGROUND

Simulation has long been utilized and prioritized in high-risk industries such as aerospace, transportation, and nuclear energy to train and sustain expert performance. Mandated simulation training has made these industries safer. When simulation is used effectively, it can enhance performance significantly. The use of simulation training has been shown to improve clinical reasoning and performance, communication, and teamwork.

Health care is also a high-risk industry. The use of simulation is increasing, as companies like Mentice, Simbionix, and MSC develop simulation solutions that improve outcomes.

ADVERSE EVENTS

When looking for root causes of poor patient outcomes, correlations can be made between poor clinical performance and ineffective communication and teamwork.

Some studies report that 52 to 70% of adverse events are tied directly to poor teamwork and communication. One study documented a correlation between poor teamwork in the operating room (OR, due to poor communication and hand-offs during intra-operative procedures) and higher morbidity and mortality (odds ratio 4.82; 95% confidence interval, 1.30–17.87). Similar results were found in the perinatal area, where 70% of sentinel events (perinatal mortality or disability) were attributed to communication failures between either healthcare providers, family members, or both.

...When Dignity Hospital engaged MSC to implement simulation based team training with their clinicians as a part of their overall sepsis initiative, they reported that patient outcomes improved dramatically, over the next few years: 1,476 lives saved, a 73% reduction in morality, and a $69 million cost reduction...
KNOWLEDGE TRANSFER

Clearly, poor quality of care will result in poor patient outcomes. Routine practice and standardization can improve many interventions, yet many healthcare facilities lack equipment and processes to effect such change. Instead of setting aside regular training time, healthcare providers must rely on independent, passive educational activities, such as lecture-based learning. This type of instruction is ineffective at changing the behavior of a provider.\textsuperscript{12}

In fact, research shows that it takes 20 years for evidence to be adopted at the bedside.\textsuperscript{13} Moreover, many senior nurses and physicians are resistant to adopt evidence-based practice, as they graduated at a time when evidence-based medicine was not integrated into educational programs.\textsuperscript{14}

To accelerate the adoption of evidence-based medicine and standardization of care, many hospitals have begun relying on protocols and checklists. The literature, however, confirms that checklists are nearly useless without effective training.\textsuperscript{15}

CULTURAL COMMITMENT

MSC believes that the delivery of high quality care and better patient outcomes requires a cultural commitment to performance improvement. Structures, processes and outcomes of care must be continually monitored, continued educational opportunities must be offered,\textsuperscript{16} and mechanisms must be put in place for development and maintenance of clinical skills.\textsuperscript{17}

COMPETENCE AND CONFIDENCE

Over the past fifteen years, simulation has become pervasive in nursing and medical colleges. It is a proven method to develop cognitive, affective, and psycho-motor skills.\textsuperscript{18} When clinicians are awarded the opportunity to learn new skills in a realistic, simulated environment, they often feel more competent and confident and are more likely to adopt those skills into clinical practice.

Two studies document this effect among Emergency Medical Residents that participated in a sepsis simulation training exercise. Subsequently, they were reported to take more appropriate and immediate action in administering evidence-based care to patients.\textsuperscript{19,20} This is an especially important finding, as results released by the Surviving Sepsis Campaign (SSC, in 2010) demonstrate that adherence to sepsis bundles decreases sepsis mortality dramatically.

Simulation-based training can have an impact on reducing healthcare acquired infections as well. When ICU residents engaged in central line insertion simulation training, their patients experienced fewer catheter related blood stream infections (0.50 infections per 1000 catheter-days) compared with both the same unit prior to the intervention (3.20 per 1000 catheter-days)
catheter-days) (P= .001) and with another ICU in the same hospital throughout the study period (5.03 per 1000 catheter-days) (P= .001).21

The perioperative environment is also a place where simulation based training can improve outcomes. One study demonstrated that surgeon participation in virtual simulation training resulted in better quality of care for the patient.22

COMMUNICATION

Simulation-based team training can dramatically improve communication between healthcare clinicians. Better communication is often recognized as a best practice to improve patient safety. In 2010, the National Quality Forum listed team training and skill building as one of the “34 Safe Practices for Better Healthcare”

“Healthcare organizations must establish a proactive, systematic, organization-wide approach to developing team-based care through teamwork training, skill building, and team-led performance improvement interventions that reduce preventable harm to patients...training programs should systematically address and apply the principles of effective team leadership, team formation [and team processes]” 24.

In 2013, the Agency for Healthcare Research and Quality listed simulation based training and team training as two of their top 12 Encouraged Patient Safety Practices (PSP).25

Simulation-based training is particularly useful with code teams and rapid response teams. The use of a simulator to practice as a team in stressful clinical situations has been shown to improve patient outcomes.4

PROCESS IMPROVEMENT

In situ simulation has been effective at finding operational deficiencies such as safety hazards, lack of equipment, poor work flow and ineffective team communication.26 In situ simulations and classroom simulations can be utilized to not only assess competence, but also educate clinicians to new protocols, checklists and alerts and accelerate their adoption.27

RETURN ON INVESTMENTS

Documenting a cause-and-effect relationship between simulation training and cost reductions can be difficult, but when results are reported over several months, the impact may be extraordinary.

MSC utilizes simulation to educate clinicians on the use of evidenced-based care for sepsis. The use of evidence-based care can improve outcomes greatly. A well-respected study from the Surviving Sepsis Campaign (SSC) documented a median per-case cost reduction from $21,985 (prior to the implementing SSC guidelines) to $16,103.

When Dignity Hospital engaged MSC to implement simulation based team training with their clinicians as a part of their overall sepsis initiative, they reported that patient outcomes improved dramatically, over the next few years: 1,476 lives saved, a 73% reduction in morality, and a $69 million cost reduction in an 8-hospital system.

Studies surrounding the use of simulation based training for new graduate nurses’ orientation and nursing school education are ongoing. In 2014, a landmark study was released in the Journal of Nursing that found substantial evidence that substituting high-quality simulation experiences for up to half of traditional clinical hours produced comparable end-of-program educational outcomes and new graduates that were ready for clinical practice.29

When simulation based training was used to enhance nursing orientation clinical time, it was found to increase RN competency in a shorter period of time. The academic center reported a total estimated gross savings of $702,270 over a 12-month period.30
REFERENCES


REFERENCES continued...


28. Dignity health


WHEN SIMULATION BASED TRAINING WAS USED TO ENHANCE NURSING ORIENTATION CLINICAL TIME, IT WAS FOUND TO INCREASE RN COMPETENCY