A Simulation Journey: Developing, Designing & Constructing the University of Wisconsin Health Clinical Simulation Program & Center

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UW Health Clinical Simulation Program Manager

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Principal, Flad Architects

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Director of Operations, WISER Institute

Disclosure: George Keeler and Laura Serebin have no financial relationships with entities producing healthcare and/or simulation-related goods and services. Tom Dongilli is the author of a course called “First 5 Minutes”, for which he receives royalties from Laerdal Medical for the sale of the course.
Learning Objectives

- Create a plan to integrate discrete simulation activities into an integrated inter-professional program that minimizes redundant activities and maximizes resources.

- Identify key steps in an integrated facility design process that builds ownership in the program.

- Illustrate how the facility establishes a centralized, unique identity and “front door” for all simulation activities.
It All Starts with a . . .
Vision: UW Health

‘Offer a world-class simulation program that promotes sharing of clinical knowledge and skills across disciplines and practitioner populations to improve the quality and safety of patient care in Wisconsin and beyond.’
Mission: UW Health

Create a comprehensive health care simulation program with focus on the health care team as well as the individual practitioner:

- Serving a variety of disciplines
- Benefiting learners of varied skill levels
- Defining and measuring competencies
- Enhancing safety and quality of care
- Improving outcomes
- Advancing simulation in health care
Simulation Programs

- Flexible simulation environment facilitating team interaction among various practitioners.
- Flexible simulation environment allowing usage by various practitioners.
- Dedicated simulation environment for discrete practitioners.
Support / New Joint Venture

New Clinical Simulation Program
January 2010

UWMF

SIM Center

UWHC

UWSMPH

UW Health Integrated Approach
Organization

UW Health
CEO's
UWSMPH  UWHC  UWMF

Executive Board
UW Health COO's (3)
Department Chairs (4)
UWHC Designate (nursing)

Simulation Center Mgmt.
Clinical Director
Administrative Director

Advisory Committee

Curriculum Committee
Research Committee
UW Health Clinical Simulation Executive Board

- **Key Dept. Chairs:**
  - Anesthesiology
  - Medicine
  - Pediatrics
  - Surgery

- **Three COOs**
  - Hospital
  - Medical School
  - Medical Foundation

- **VP of Nursing Services**
Establishing the Baseline

Evaluation of current and future training based on

- 2008 survey information
- Detailed needs assessment questionnaire – June 2010
- 170 stakeholders, identified and prioritized by project leadership
- 22 questionnaires, representing 5 departments identified as priority
  - Anesthesia
  - Emergency Medicine / Emergency Medical Services
  - Nursing
  - Pediatrics
  - Surgery
Establishing the Baseline

Questionnaire focused on

- General demographics
- Class volumes
- Current and future training and simulation needs
- Currently owned simulation technology
- Simulation settings and scheduling
  - Specific times of day (reflected in the need for ID access off hours)
  - Specific days of week
- Multi-media and information technology considerations
- Office technology considerations
Establishing the Baseline

Analysis based on

- Common factors across departments (room type / class size)
- Primary utilization for each room, with secondary multi-disciplinary and/or multi-subject utilizations noted (flexibility of rooms required)
- Location-specific and location-independent simulation equipment
- AV systems to support flexibility of each room type

Dongilli, Thomas 2010
Establishing the Baseline

Recommendations – Departmental Integration

- During the first year of operations, courses focused on:
  - Continuation / enhancement of existing simulation programs
  - Anesthesia
  - Emergency Medicine / Emergency Medical Services
  - Nursing
  - Pediatrics
  - Surgery

- Operational years two and three, additional courses for:
  - Urology
  - Medicine
  - OB/GYN
  - Internal Medicine
  - Academic Affairs/ Office of Continuing Professional Development
Recommendations

- Hours of Operation: Normal business hours with card swipe access for particular areas during off hours.

- Specific Room Types
  - Lobby / Reception / Administrative Area with hoteling station
  - General simulation rooms to serve as multi-purpose training environments including patient rooms, ICU and OR settings.
  - Surgical Skills Lab
  - Multi-purpose procedural task area
  - Conference / Debrief rooms
  - Control Rooms
  - Storage
Quantification of Needs

Calculated total net square feet and added multiplier for circulation to determine total space required for 5-year plan. Space required exceeded space available. Prioritized rooms required at move in (3-year plan) and re-calibrated the program.

Identified future spaces required for 5-year plan “below the line”
Designated Space

Influences and Opportunities

6,500 SF

Raised Flooring

Raised Flooring

Raised Flooring
Workplan

Concept Design layout based on program fit in designated space and input from Core Team leaders

“Super-User” group Open House to review Concept Design

Series of 3 “Technical User” group meetings to refine design

Established multi-disciplinary user groups organized by groups by work environments

Operating Suite  Trauma and Critical Care  Pediatrics

In-patient Care  Emergency Services

Admin User Group
UWHC: __________
UWSMPH: __________
Flad: Laura, Jamie

Entry/Public Space User Group
UWHC: __________
UWSMPH: __________
Flad: Joye, Bill, Laura, Jamie

Surgical/Procedural Skills User Group
UWHC: __________
UWSMPH: __________
Flad: Joye, Bill

Control Room User Group
UWHC: __________
UWSMPH: __________
Flad: Joye, Bill

Support Space User Group
UWHC: __________
UWSMPH: __________
Flad: Joye, Bill

Patient Room User Group
UWHC: __________
UWSMPH: __________
Flad: Joye, Bill

Classroom/Debrief User Group
UWHC: __________
UWSMPH: __________
Flad: Joye, Bill, Laura, Jamie

Operating Room User Group
UWHC: __________
UWSMPH: __________
Flad: Joye, Bill
Planning & Design Process

Design
- Outline objectives & features required in each type of space
- Synthesize ideas in design options
- Test ideas with user groups and evaluate pro’s / con’s
- Refine design
- Translate to drawings, equipment lists & specifications

Ownership
- Promote open-mindedness and forward thinking
- Use transparent process
- Convert the zealots to champions/stakeholders
- Emphasize building a new culture
- Walk the talk
- ENGAGE, ENGAGE, ENGAGE!
## Planning & Design Process

### Which design elements matter the most

<table>
<thead>
<tr>
<th></th>
<th>Must-Have</th>
<th>Nice-to-Have</th>
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<tbody>
<tr>
<td>Flexibility of space types</td>
<td>✓</td>
<td></td>
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<tr>
<td>Dedicated rooms for specific equipment</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>High fidelity environments</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Adequate storage / support spaces</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Expandability</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Ability to support evolving simulation technology</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Basic Observation Capabilities</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Unique identity / “front door”</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Flow between rooms</td>
<td>✓</td>
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</table>
### Planning & Design Process

**Which AV capabilities matter the most**

<table>
<thead>
<tr>
<th></th>
<th>Must-Have</th>
<th>Nice-to-Have</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operate and interact from control room</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Capture and playback locally for debriefing</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Live streaming locally</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Live streaming via web access</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Expandability</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Capture data from simulators &amp; medical equip.</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>High definition cameras</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Tools which allow for assessment and analysis</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Video and data storage</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>
Planning & Design Process

- Focus on user-centered interface throughout the design process
- Transparent decision making process
- Iterative process of discovery, synthesis, evaluation and refinement

Objectives:
- Optimize resources
- Define qualitative expectations and outcomes desired
- Build ownership at departmental and individual levels
Creating a Unique Identity

Finalizing the Design - Key Ideas

- Design for flexibility and adaptability at both facility and room level
- Consider adjacencies and flow between rooms
- Optimize support spaces and resources
- Continual re-engagement of participants to review and evaluate
Creating a Unique Identity: Simulation Rooms 1A/1B

**Primary Use:**
Patient Room / Trauma / ICU

**Other Uses:**
ED treatment room / Exam Room
Pre-op / recovery bay

**Key Characteristics**
- Operable wall partition to divide room
- 3 headwalls / multiple monitors

**Degree of Flexibility:** High

**User Group Participants:**
Nursing, ICU, Emergency Medicine,
Pediatrics, Medicine
Creating a Unique Identity: Simulation Rooms 1A/1B

3-bay ICU / PACU configuration

Individual rooms configuration
Creating a Unique Identity: Simulation Room 2 – “Swing”

Primary Use:
Trauma / Surgical OR / C-section / ICU

Other Uses:
Patient Room / Pre-op / recovery bay

Key Characteristics
- Supports use of high fidelity manikins
- Utilizes existing raised floor
- Headwall added for flexibility of use

Degree of Flexibility: Medium-High

User Group Participants:
Emergency Medicine, Surgical nursing, Critical Care, Trauma, Pediatrics, Anesthesiology
Creating a Unique Identity: Simulation Room 2 – “Swing”
Creating a Unique Identity: Simulation Room 3 – OR

Primary Use:
Operating Room

Other Uses:
Trauma, Technology Trials, Environmental Services

Key Characteristics
• Designed to accommodate METI HPS
• Utilizes existing raised floor
• Direct observation from Debrief Room

Degree of Flexibility: Low

User Group Participants:
Anesthesiology, Surgery, Surgical Nurses
Creating a Unique Identity: Simulation Room 3 – OR
Creating a Unique Identity: Skills & Procedures Lab

Primary Use:
Surgical Skills / Procedures Training

Other Uses:
Mass casualty

Key Characteristics
- After-hour controlled (card-key) access
- “Smart” walls
- Adjacent storage

Degree of Flexibility: Medium - High

User Group Participants:
Surgery, Nursing, EMS
Creating a Unique Identity: Skills & Procedures Lab

Individual task trainer configuration

Team Task Trainer Configuration

Mass Trauma Configuration
Creating a Unique Identity: Multi-Purpose Room

Primary Use:
Debrief / Procedures Training / Medical Product Demonstrations / Classroom

Other Uses:
Mass casualty

Key Characteristics
• Operable wall to divide room
• A/V enables the two rooms to be used independently
• Extra receptacles and compressed air to support a variety of scenarios.

Degree of Flexibility: Medium

User Group Participants: All user groups
Creating a Unique Identity: Multi-Purpose Room

Debrief Configuration

Mass Trauma Configuration

Team Task Trainer Configuration
Creating a Unique Identity: Control Rooms

Key Characteristics

• Strategic location
• AV racks in ventilated enclosure
• Large viewing windows
• Efficient use of space

User Group Participants:
Media experts and operators / instructors
Creating a Unique Identity: Lobby / Admin Area

Key Characteristics

- Public image that communicates vision / innovation of the center
- Open work area
- Includes hoteling work stations
- “Right-sized” space

User Group Participants:
Administration, Visitors, IT
Facility is “Front Door” to the Simulation Program
Summary: Lessons Learned

- Know what you want to be / Do not try and be all things to all people
- Provide flexibility in what you design
- Operate in a transparent, non-biased process / Keep users engaged
- Designate decision-makers
- Be prepared to make hard decisions
Thank You! Questions?

http://www.med.wisc.edu/clinical-simulation-program/main/27978
# Summary – Current Utilization

<table>
<thead>
<tr>
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<th>2011* Hrs.</th>
<th>2012* Hrs</th>
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<tbody>
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<td>Pediatrics</td>
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<td>125</td>
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<td>UWHC Nursing</td>
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<td>125</td>
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<tr>
<td>Surgery</td>
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<td>35</td>
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* Six month periods
## Usage by Primary Groups

### Regular Simulation Activities: Last Update - December 2011

<table>
<thead>
<tr>
<th>Undergraduate</th>
<th>Residents/fellows</th>
<th>Cont. Professional Dev.</th>
<th>Inter-Professional</th>
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<tbody>
<tr>
<td><strong>Anesthesia</strong></td>
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<td>Interest group</td>
<td>ACLS renewal</td>
<td>ACLS renewal</td>
<td>Mock codes</td>
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<tr>
<td>Cardiac arrests</td>
<td>CPR orient</td>
<td>ALS Simulation</td>
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<tr>
<td>Clerkship - Intubation</td>
<td>ALS course</td>
<td>Difficult airway</td>
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<tr>
<td>Clerkship - Basic anesthesia</td>
<td>ACLS recognition</td>
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<td>Roy codes</td>
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<tr>
<td>Clerkship - Vascular Access</td>
<td>ACLS-Instructor course</td>
<td>Pediatric anesthesia</td>
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<tr>
<td>Resuscitation course</td>
<td>Ultrasound</td>
<td>Issues in liver transport</td>
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<tr>
<td>Airway workshop</td>
<td>Pre-op</td>
<td>Rare cases</td>
<td></td>
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<tr>
<td>Procedure</td>
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<td><strong>Surgery</strong></td>
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<tr>
<td>IV/blood gas</td>
<td>ATLS certification</td>
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<tr>
<td>Laparoscopic skills</td>
<td>Introsurgical skills</td>
<td>Difficult airway</td>
<td>Roy codes</td>
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<tr>
<td>Vascular access skills</td>
<td>Vascular access skills</td>
<td>Difficult airway</td>
<td>Roy codes</td>
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<td>Roy codes</td>
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<td><strong>Intensive Care</strong></td>
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<td><strong>ER, OB, NICU</strong></td>
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<td><strong>UWMC Nurses</strong></td>
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<td>Advanced airway</td>
<td>Difficult airway</td>
<td>Mask codes</td>
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<td>Mask codes</td>
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<td>ALS</td>
<td>Mask codes</td>
<td>Roy codes</td>
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<tr>
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<td>Airway Management</td>
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<td></td>
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<tr>
<td><strong>Critical Care</strong></td>
<td></td>
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<td><strong>Cardiac Arrest</strong></td>
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<td><strong>Elective</strong></td>
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<td>Central Line Placement</td>
<td>Team Communication</td>
</tr>
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<td>Intubation</td>
<td>BM-Related Skills</td>
<td>Central Line Placement</td>
<td>Team Communication</td>
</tr>
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<td><strong>Cardiac Arrest</strong></td>
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<td>Team Communication</td>
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<td><strong>Critical Care</strong></td>
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<td><strong>Infection Control</strong></td>
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<tr>
<td><strong>Ultrasound</strong></td>
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</table>
Establishing the Baseline

Recommendations – Course Type Summary

- ACLS training and certification
- Crisis management
- Team management
- PALS
- Airway management
- ABLS
- Pre hospital protocols
- AHA courses
- ATLS surgical
- ATLS skills
- Clinical conditions with positive and negative outcomes
- Suturing and/or knot tying
- Laparoscopic skills training
- Cardiac procedures (including angiography, angioplasty, stent, etc.)

- OR procedures
- Insertions (Foleys, chest tube, IVs, central lines)
- Ultrasound
- OR communication and/or team training
- Mock Code
- Airway access
- ECMO
- PALS
- Central line
- Crisis training and teamwork
- Critical care transport
- Sedation
- Resuscitation
- In situ pediatric anesthesia
- Interdisciplinary training
- Pediatric resuscitation
**Schedule / Process**

60 WEEKS

<table>
<thead>
<tr>
<th>May</th>
<th>June</th>
<th>July</th>
<th>Aug</th>
<th>Sept</th>
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<td>48</td>
<td>52</td>
<td>56</td>
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</table>

**Program Validation / SD**

- 8 weeks
  - Deliverable
    - Questionnaire to Stakeholders
    - Present Stakeholder Report:
      - Stakeholder Summary
      - Space Utilization
      - Simulation Equip
      - AV/IT Specs
      - Prelim Layout
    - Functional Narrative
    - Existing Facility Assessment
    - Basis of Design
      - Architectural
      - Structural BOD (as required)
      - MEP

**DHFS Meeting**

- UWHC / DSF / FPM Comments

**Design Development**

- 8 weeks
  - Deliverable
    - Scope of demo
    - Arch Drawings
      - Plan, RCP, Elev/Sect
      - Finishes, typ. details
      - door schedule
    - MEP System plans
    - Structural plans, details (as required)
    - Equipment List
    - Draft Spec

**DHFS Review**

- UWHC / DSF / FPM Comments

**Construction Documents**

- 12 weeks
  - Deliverable
    - 100% CDs
    - Bid CD’s
      - 4 weeks
      - (-2 weeks)
    - Move in Aug 2011

**DHFS Approval**

- UWHC / DSF / FPM Comments

**Hire Contractor**

- Cost Validation

**Demo**

- 4 weeks

**Construction**

- 26 weeks