

How did you do that???

Enhancing Realism in Patient Simulation

Christopher Scott, Director of Clinical Education & SIMS Medical Center
Jeffrey Witek, Simulation Coordinator, SIMS Medical Center
SPRINGFIELD TECHNICAL COMMUNITY COLLEGE

Realism, Webster's way

“true and faithful portrayal of nature and of people in art and literature”

Factors that are Required for a Successful Realistic Simulation

- Plausible Environment
- Plausible Responses
- Plausible Interactions
- Familiar Equipment
- Realistic Simulation Equipment

- Seropian, M. Technology, Computing and Simulation (2003) Anesth Analg

What is Realistic?

- REALITY- A MATTER OF PERCEPTION
 - Instructor must have the ability to manipulate “on the fly”
- As long as participants perceive the environment and responses as plausible, then the simulation will remain intact

Fidelity

- the quality or state of being faithful **b**: accuracy in details : exactness²: the degree to which an electronic device (as a record player, radio, or television) accurately reproduces its effect (as sound or picture)

Equipment Fidelity

- The degree to which the simulator duplicates the appearance and feel of the real system.
 - Example: A simulator that realistically mimics the layout of an aircraft cockpit.

Environmental Fidelity

- The extent to which the simulator duplicates motion cues, visual cues, and other sensory information from the task environment.
 - Example: A flight simulator can be defined as high or low fidelity depending on whether or not the motion and video cues were turned on or off.

Psychological Fidelity

- Degree to which the *trainee perceives* the simulation to be a *believable surrogate* for the trained task or real patient encounter
- Allows learner to make conceptual sense of the scenario
- ***Generally considered to be the most essential requirement for team training***
- ***Without suspending disbelief trainees are unlikely to behave in the simulation as they would in the real world!***
- ***As a result, the training will have little or no application to the post-training environment!!***

A Typology of simulation fidelity (adapted from Rehmann et al, 1995)
Beaubien, Baker. *Quality and Safety in Health Care*, 2004.

“Skillful blending of the three modes of thinking about realism [environmental, equipment, and psychological] will allow our trainees to ‘suspend disbelief,’ or to actively sign up for the ‘fiction contract’ that this is a situation with real relevance for them.”

Rudolph et al. Sim Healthcare. 2(3):161-163, Fall 2007.

Tips for realistic scenarios

- Provide adequate instruction to both performers and evaluators
 - Admit the limitations of simulation
 - Establish the ground rules to address the limitations before running cases
 - In general:
 - If simulator provides it accurately, find it
 - If simulator does not provide it accurately, must be sought and represented verbally

Tips for realistic scenarios

- Run multiple cases concurrently
 - It's how we actually practice
 - Better assessment of overall performance
 - Medical knowledge
 - Procedural skills
 - Prioritization, multitasking and organization
- Vary the cases run
 - Should not be intubating and shocking the mannequin every use
 - Create realistic alternatives (ex: CPAP)

Fiction Contract

- Is a joint endeavor that students and the debriefer create
 - The instructor agrees to make the simulation as real as possible within the resource and technology constraints
 - Participants agree to do their best to act as if everything is real. (Suspend Disbelief!)
 - Instructor will state a fair and balanced assessment of simulator strengths and weaknesses
 - AKA - Introduction to Simulator

“A successful scenario is not based on the realism of the simulation itself, but rather the alchemy of participants stepping into their roles, connecting with others in the scenario, and actively linking to their previous social, clinical, and psychological experience.”

Moulage

Examples of Patient Cases

Tips to match appearance

- Post-Halloween shopping spree
 - Hair
 - Clothes
 - Patient gowns (yeah, all our patients are in gowns)
 - Street clothes
 - Sizes - Clothes & shoes
 - Makeup
 - Jaundice
 - Rashes
 - Burns
 - Abrasions and contusions
 - Diaphoresis
 - Gender
 - Wigs
 - Female Parts

Background

- It is also important to understand the physiology that is going on
 - What is the age of the wound?
 - What environment did the wound occur
 - In the field or in the OR?
 - Do you need to bring in some dirt?
 - Is the wound infected?
 - Do we need odors?
 - Do the bones really bend that way?
 - Do we need sound? Background noise?
 - Do we need actors?

Items We Use...

"Schkin"

Dish Soap

Washable Paints

Glycerin

Honey

Corn Syrup

Corn Syrup

Fiber Therapy



BEN NYE

Items We use on a daily basis

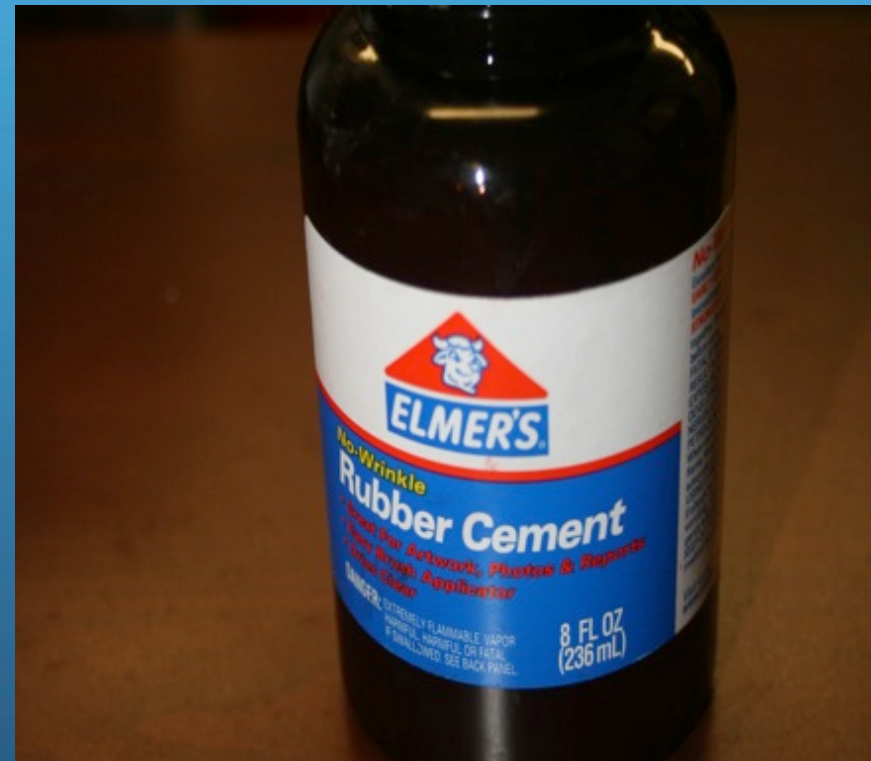
- Sponges
- Brushes
- Filter Pads
- Cutips
- Saran Wrap
- Rubber Cement
- Washable Paints
- Powder Based Make ups
- Ben Nye Makeup/Wheels
- Glycerin
- Vaseline
- Corn Starch
- Metamucil
- Stage Blood & Scab Blood
- Fake Urine
- Liquid Latex

SMELLS



Base Layer

It is important to place a base layer of protection onto the simulator to allow for moulage to be easily removed upon completion of the scenario(s).



Compound Fractures

- Same as lacerations
- Impale bone
 - Chicken
 - Rib
- Cotton
- Red lipstick
- Rubber bands
- Coffee stirrers



SCHKIN

Here are a few simple recipes we came up with to match our manikins skin, we chose to use an acrylic latex paint to color the schkin.

We've kept schkin for over a year so far without change (mold, dryness, etc)

After thoroughly mixed, the paint does not come off or stain. We've tried several mixing methods and found that Heating the petroleum jelly in a stainless steel mixing bowl (double boiler) adding the paint, mix until single color, then add the powder works the best for mess control and color consistency.

The following formulas were formulated using a digital scale that measures in .000 or can be measured in cc's with syringes

3G SimMan SCHKIN (to match color for 3G)
 .120 lb Petroleum Jelly (2 oz tube)
 .250 lb (3oz baby powder)
 .005 lb (or 2.5cc) Skintone (949) Folkart Acrylic Paint

SimMan SCHKIN (to match color for sim man)
 .060 lb Petroleum Jelly (1 oz tube)
 .125 lb (1.5oz baby powder)
 .005 lb (or 2.5cc) Skintone (949) Folkart Acrylic Paint

Meti Istan SCHKIN (to match ISTAN)
 .060 lb Petroleum Jelly (1 oz tube)
 .125 lb (1.5oz baby powder)
 .005 lb (or 2.5cc) Skintone (949) Folkart Acrylic Paint
 .005 lb (or 2.5cc) Nutmeg Brown (20432) Apple Barrel Colors

Supplies:
 Skintone (949) Folkart Acrylic Paint
 Nutmeg Brown (20432) Apple Barrel Colors
 Baby Powder
 Petroleum Jelly



<http://www.plaidonline.com/productDetail.asp?itemID=949>

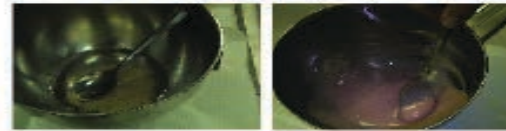
1. Weigh out the desired amount of paint to match the color



2. Warm up the petroleum jelly to liquid



3. Add paint to the jelly and stir, as it cools the paint will begin to mix



4. Once the paint is thoroughly mixed, add the powder and mix completely



5. After it allows to cool, add more powder and knead to desired texture

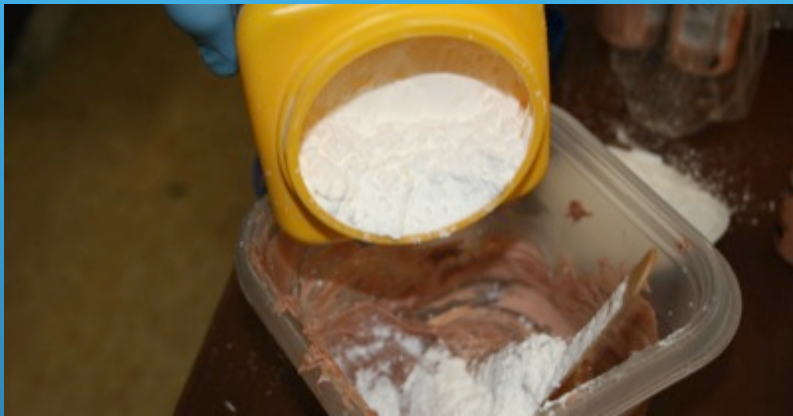


We've used this Recipe as a great base for laerdal products when moulaging Below are a few pictures of an OR fire we recently did using schkin



Have Fun!
 Ted Makalinaw/Erin Manning
 Patient Safety Training Center
 Dartmouth Hitchcock Medical Center





SCHKIN!

- Place enough schkin to area where you will make injury and blend it into the the area on simman.



Applying color

- Apply necessary color from color wheels to make injury realistic



Partial Thickness Burn



Partial Thickness Burn



Frostbite

- Use black eye shadow
- Fade in with white
 - Jimmy Rowland



Road Rash/Abrasion

- Use filter sponge and apply color from color wheel to show road rash and abrasions



Seat Belt Bruising

- Use sponge and filter sponge to apply bruising color wheel in a pattern to represent an apparent bruise from a seatbelt.



Gun Shot Wound

- Apply skin
- Make a divot in the skin to represent a bullet hole.
- Optional: Place eraser head in wound to mimic bullet.
- Apply ash around area if GSW was at close range
- Use pourable stage blood out of GSW Wound.



GSW Entrance Wound



GSW Exit Wound



Impalement

- Build up skin and mold into area
- Apply color wheel
- Insert impalement into skin
- Apply stage blood as appropriate



Impalement



Examples of Burns/Blisters

- Apply liquid latex from Ben Nye to an area where you would like a burn/blister to appear.
- Let Air Dry to a dry/tacky consistency



Designing of Burn

- Once to a dry/slightly tacky consistency, use cue tip to pull areas of the liquid latex apart to make appearance of burn/sliding skin.



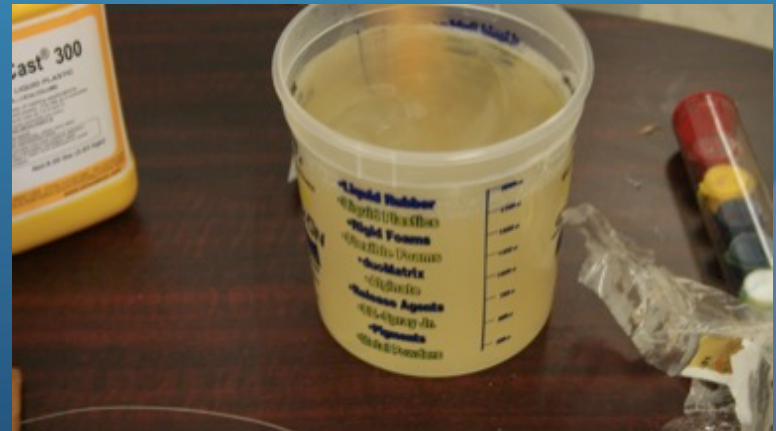
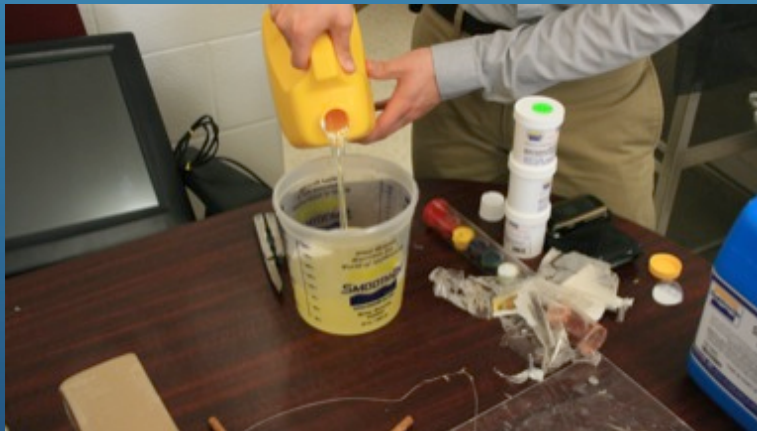
Apply blood from color wheel and ash/charcoal to wound, cover with petroleum Jelly



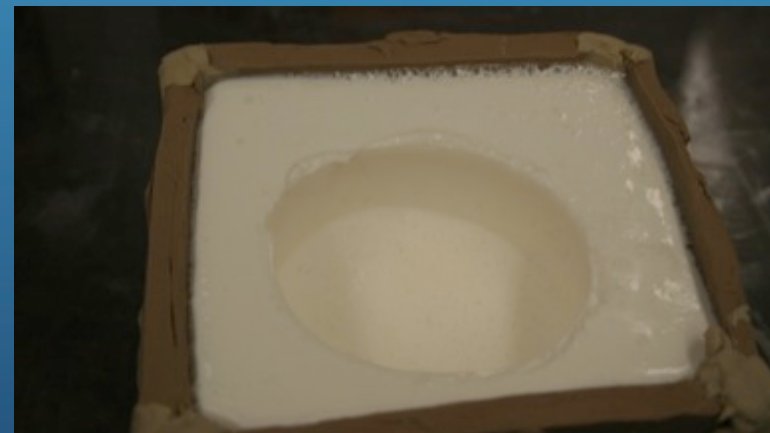
Intestines



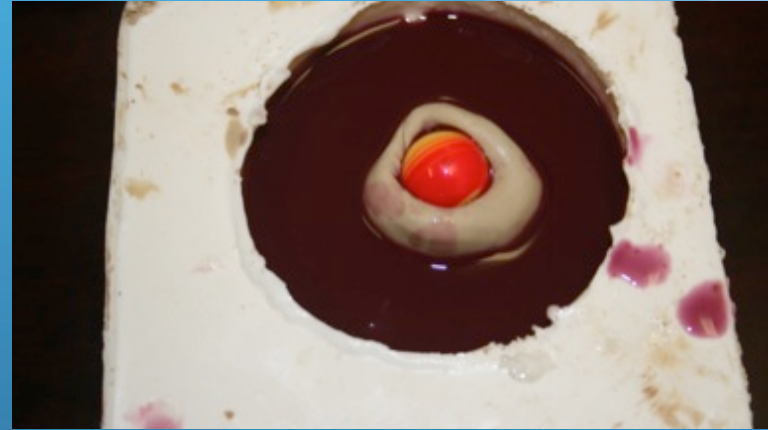
Building a mold



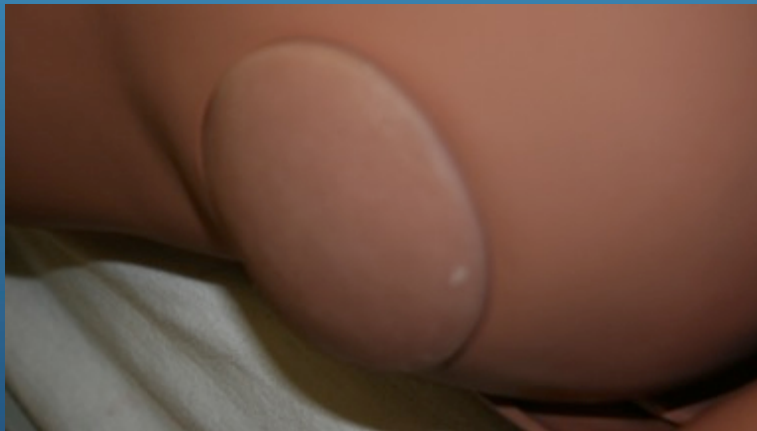
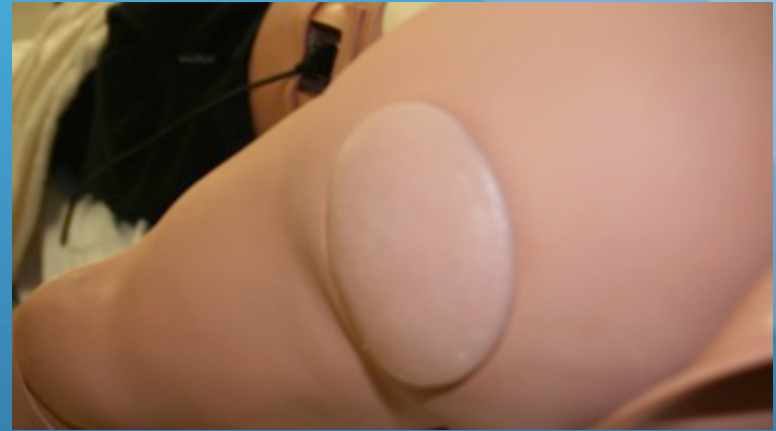
Making a Mold



Building a sebaceous cyst and blood into the mold



Sebaceous Cyst Pads Completed



Cleaning Supplies



Ben Nye Kit



Resources

- www.cert-la.com/education/moulage-recipes.pdf
- www.behindthesimcurtain.com
- www.whatcomcountyems.com/pdfs/CE%20Instructors/BASIC%20MOULAGE.pdf
- www.moulageconcepts.com
- www.sickkitchen.com

Some Examples

- Just some examples of what you can do
- [http://www.shopanatomical.com/
Casualty_Simulation_Moulage_s/14234.htm](http://www.shopanatomical.com/Casualty_Simulation_Moulage_s/14234.htm)
- www.moulage.net
- <http://www.stagemakeuponline.com/>
- www.pocketnurse.com
- www.wallcur.com