Innovations Abstracts

1 "UltraSimageddon:" An Intra-city Emergency Medicine Residency Competition

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Background: Interactive educational methods are gaining favor over lecture-based didactics for emergency medicine (EM) education. Simulation(Sim) and ultrasound(US) are useful for reducing lecture-based teaching and integrating the growing emphasis in graduate medical education on knowledge application, direct observation, standards-based evaluations, and team-based care. Collaborative, team-based activities can improve communication skills and teamwork. Cities with multiple residencies have an opportunity for collaboration and resource sharing.

Educational Objectives: Our goals for the "UltraSimageddon" project were to increase the collaboration between intra-city EM residencies, create a non-lecture based learning experience, facilitate hands-on team-based medical care, and explore the residents' reception of Sim and US curricular integration.

Curricular Design: The "UltraSimageddon" project had two organizers: the Sim and US program leaders at two academic EM residencies in San Antonio, TX. EM residents from both programs rotated and competed at stations that involved Sim cases using high fidelity simulators, US skills assessments, and EM board-style questions. Learning objectives and point-valued checklists were created for each station; scores were totaled. The final event of the day was a "Simwars"-style competition that integrated Sim and US skills. After the cases, a short debriefing was completed on non-medical skills involved in the cases. An online survey was sent to the residents after the experience to assess the event.

Impact/Effectiveness: Overall, 95% of respondents would like to see this type of collaborative educational activity in the future (21/22). The median response was 4/5 regarding the usefulness of the experience on a 1-5 Likert scale.

We were successful in creating an enjoyable, collaborative active experience between two EM residencies that involved Sim and US and challenged medical and non-medical skills. This type of project can be replicated at other institutions. The short concise post-sim debriefings focused on non-medical skills, but could be adjusted according to different preset objectives. Continued improvements of these events require resident buy-in; their feedback is essential to improving future iterations of the project.

2 A Novel Eye Model for Simulation in Lateral Canthotomy

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Background: We sought to develop an inexpensive simulation model that could be used for instruction of the emergency medicine model of practice for lateral canthotomy. Ophthalmologic emergencies present an opportunity for severe morbidity. Lateral canthotomy provides an opportunity for intervention and can be vision saving if performed promptly. With the temporal relationship of increased intra-ocular pressure (IOP) associated with Orbital Compartment Syndrome (OCS), especially secondary to traumatic injuries with associated retro-bulbar hematoma there is a need for Emergency Providers (EPs) to have the ability to perform potentially vision saving procedures. While an important skill, it is infrequently performed with an estimated 0.088% incidence among craniomaxillofacial (CMF) emergencies. The ability to gain and maintain competency can be difficult and expensive often relying on cadaveric models. We aim to provide an inexpensive, high fidelity simulation model to give providers the opportunity to gain and maintain competency with lateral canthotomy.

Educational Objectives: Gain familiarity and psychomotor skills for competently addressing a lateral canthotomy procedure.

Curricular Design: Using easily obtained items and animal eyes, we constructed an inexpensive model for lateral canthotomy. For this model, eyes from recently harvested bovine and ovine specimens were used. Each model was less than ten dollars (US) to build. The models can be maintained in a refrigerated environment for at least 3 days. Desiccation due to refrigeration can be repaired with insufflation of the anterior chamber and/or vitreous with crystalloid solution. The models were used in small groups to walk learners through the procedure

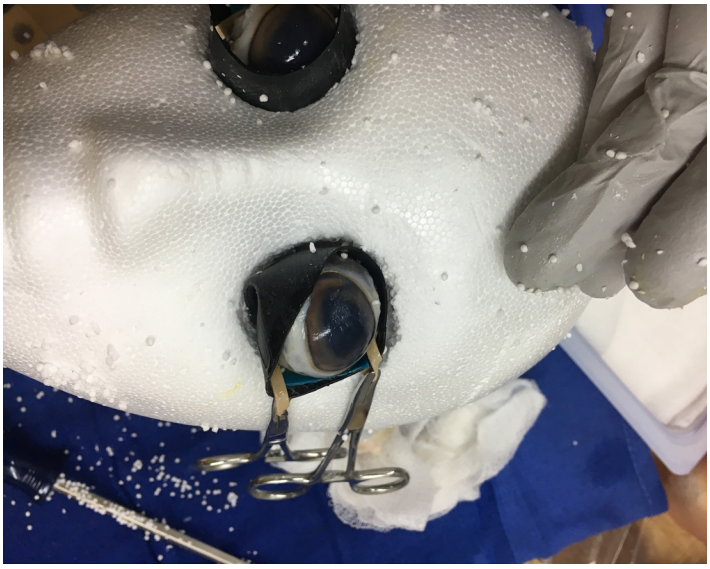
Materials:

- Wig/beautician model heads may be obtained in beauty supply shops, online or in craft stores
- Animal eyes-local butchers and slaughterhouses can provide recently decapitated heads for dissection. In our example, a local butcher shop processed deer carcasses and provided the heads without charge. Bovine or porcine heads can also be used.
- Industrial epoxy and glue. For this model we used Gorilla Glue® as it provides a bubble filled, expansive matrix that stabilizes the eye tissue in its orbit.
- Cyanoacrylate- for adhering the rubber components together

- Syringes with 27ga needles- to re-fil dessicated orbits
- Bicycle intertube- size varies depending on eyes used.
- Rubberbands 1-2mm thick
- Rubber tourniquet material

Steps:

- Create orbits in mannequin heads with drill bit and depth to be matched to the size of the eye (Image 1).



- Cleanly dissect eyeballs from orbits removing all excess tissue
- Cut a small section (1 per eye) of bicycle tubing. Cut a 2 cm length of tourniquet band (1 per eye). Cut 6cm segments of rubberbands (1 per eye).
- As shown in (Image 2) glue the pieces of rubberband and tourniquet in layered fashion at a point that will sit lateral to the eye when inserted.
- Dry the posterior portion of the eyes with compressed air and insert them into the tubing gluing them in place.

Impact/Effectiveness: Ophthalmologic procedures performed in everyday emergency medicine practice are difficult to simulate, and infrequent procedures such as lateral canthotomy can be difficult to teach and train others to master. This model provides a resource for faculty to safely guide learners through the details of lateral canthotomy. It affords trainees the rare opportunity to perform these techniques in a safe environment.

To reiterate the infrequency of this procedure only 10% of our participants have performed a lateral canthotomy in practice. 76% of the participants felt more comfortable performing the procedure after using the model, including those that had performed the procedure previously.

3 Asynchronous Curriculum Socially Synchronized: Adult Learning Via Competition

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Background: Widespread in Emergency Medicine (EM) residencies, Asynchronous learning is a method to move education outside of classic classroom settings. Prior asynchronous curricula in our three-year EM residency focused on learners covering information in isolation and then taking a quiz to achieve a mark of completion. Learners then moved on to the next quiz, often with no reinforcement of their knowledge. We believe there is a lost opportunity to solidify knowledge and engage active learning by integrating a social aspect and gamification model to traditional Asynchronous Curriculum.

Educational Objectives: Our objectives were to encourage adult-style learning, increase resident engagement through gamification, and to improve long-term knowledge retention via spaced repetition.

Curricular Design: We created a website, AlamoCityEM.com, with a wide array of monthly options of open access medical education resources and traditional EM textbook chapters. Each option has an estimated time for completion. Residents select a total of 4-hours worth of material. In an innovative step, rather than utilize a pedagogy model of quizzes, residents are treated as adult learners and submit 12 facts or clinical pearls they learned from the material.

The learning points from all residents are then used to create