Introduction: * Discussing recent tragedies: * San Bernardino: 14 dead, 22 wounded * Paris: 129 dead, 352 injured * Deaths by unregulated gun fire and IED * Victims often rely on the response of emergency medical personnel for treatment of their wounds, and uninjured victims are too fearful or are too inexperienced to recognize and treat the wounded * Under utopian circumstances, emergency medical personnel strive for an 8 minute response time (http://www.ncbi.nlm.nih.gov/pubmed/22026820) * However, under active shooter incidents as described above, protocol dictates that the area perimeter first be secured, and the threat level of the area be transitioned from a "hot zone" to, at best, a "warm zone", which can delay response anywhere from an additional 10 minutes to 2 hours (http://alerrt.org/files/research/ActiveShooterEvents.pdf , http://www.publicsafety.ohio.gov/links/ems_Evolution-of-EMS-Response-to-Active-Shooter-Incidents.pdf) * Injuries of the wounded and survival rates during such active shooter incidents as described above have not been studied in depth * However, their composition is similar to those experienced by soldiers on the battlefield * Most combat casualties die before ever reaching the hospital (http://www.ntoa.org/massemail/CarmonaW12.pdf) (http://www.ncbi.nlm.nih.gov/pubmed/23192066) * The most common preventable causes of death on the battlefield are hemorrhages, airway obstructions, and pneumothorax * Since the start of operation Iraqi Freedom, the United States military has incorporated tactical casualty combat care (TCCC Butler A Decade of TCCC) * Initially military soldiers relied on treatment from medics to address their wounds * TCCC has been incorporated military wide and has become the standard for trauma care for managing combat trauma on the battlefield (Dickey 2011, Wilensky 2009, http://www.ntoa.org/massemail/CarmonaW12.pdf) ../Plots [width = 10cm]cfr.png * The success has been proven numerically with casualty fatality rate at 19% during WWII, to 15.8% during the Vietnam War, to finally 9.4% during Operation Iraqi Freedom (Holcomb et al J Trauma 2006) * Slow transitions are being made to incorporate this assessment and treatment strategy with emergency medical services, known as TECC (http://www.naemt.org/education/tecc/what-is-tecc, Callaway UFF TC PDF) * However, as stated previously, emergency services are delayed during active shooter scenarios and this puts victims at risk for treatment that is too late * Average time to exsanguination from wound hemorrhage *** NEEDED * Airway background data*** NEEDED * We hypothesize if the civilians in public settings are trained with similar combat casualty care, they can learn to assess, treat, and solve the most common causes of death during disaster scenarios and improve life expectancy.

Materials and Methods * Participants of the study were obtained as volunteers from the city of Westminster * Laypeople include Nursing grads and undergrads, Teachers, city workers, security guards, and students * Teachers, city workers, security guards and students were randomly placed into 2 groups: trained individuals and untrained individuals * Medical trained personnel include firefighters, who are pre-trained in disaster scenario in EMS training * Trained individuals were given a 2-hour TCCC training overview 6 weeks prior to the experiment

* Test participants were pre-screened about their basic knowledge of disaster scenario, with questions including “What is the primary cause of death in population ages 1-44?”, “What do you think is the standard response time when 911 is called?”, and “What is your primary concern immediately following a disaster or emergency situation”. * Every group was brought individually into a room with the chief of police, who informed them of the situation: At the mall with friends when a magnitude 7 earthquake strikes. There will be debris on the ground and light will be limited. You are tasked with assessing the situation and responding. * The room was situated to simulate a major earthquake with debris and lighting problems with 4 victims: 1 deceased, 1 arterial bleeding, 1 unconscious but breathing, and 1 healthy individual. * The participants 1st action times and time to solution were recorded by an observer playing a victim’s friend. * Data was recorded per each individual group and average times of trained, untrained, and professionally trained individuals were compared to both the arterial bleeding and airway stations

Results: