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**Abstract:**

**Till Death Do Us Part - Double Homicide and Attempted Suicide Involving a Mother and Her Two Children (1 ½ - 2 hrs.)**

The case of a 44-year-old Arizona mother, Marilyn Kay Edge, who murdered her 10-year-old daughter, Faith and 13-year-old (special needs) son, Jaelen in a Santa Ana hotel room by subduing the two children using cough syrup and then drowning them in a bath tub. All after losing custody of the children to her ex-husband in Georgia. This case review will take you from the child custody court order in Georgia, to Arizona, to the murders in Santa Ana and the mother's attempted suicide in Costa Mesa, California. All from the prospective of the handling Detectives and Lead Forensic Investigator.

**Abstract:**

**The Comparison of Entry Bullet Holes in Glass, Metal, and Wood with a Variance in Caliber, Distance and Grain Weight.**

After attending this presentation, attendees will have a better understanding of any differences in entry bullet holes in glass, metal, and wood substrates created by three different caliber ammunitions (.9, .40, and .45) with two different grain weights (light and heavy) each caliber and shooting distances representing contact, intermediate, and distant ranges. These "ballistic" variables are often encountered in shooting incidents.

This presentation will impact the forensic science firearm examination and crime scene investigation communities by improving their understanding regarding entry bullet holes and validating any expert testimony regarding the origin and relationships of these in the reconstruction of shooting incidents. This study hypothesized, as most jurors would surmise, that a larger caliber bullet with a heavier grain weight would make a larger entry bullet hole, compared to a smaller caliber bullet with a lighter grain weight. It also hypothesized that a bullet fired at a closer distance, would make a larger entry bullet hole than being fired at a further distance and one could expect significant differences in entry bullet holes depending on the nature of the target substrate. These possibilities were tested at an outdoor shooting range.

The following studies were conducted on three different surfaces (laminated glass, sheet metal, and plywood). The first study was conducted using a laminated glass as the target to simulate a vehicle windshield (24" x 24" & 7mm thickness). The second study was conducted using sheet metal as the target to simulate a metal vehicle quarter panel (24" x 24" & 20 gauge). The third study was conducted using a plywood target (24" x 24" & ½") to simulate a covering of an outdoor structure. There were three different shooting distances: near (4" inches), intermediate (24" inches), and distant range (48" inches). The shooting distances were measured from the muzzle of the handgun to the target surface. Six shots were fired for each caliber and grain weight. Six shots for the distances of the metal and wood targets, and only four shots for

the glass target, due to the fragility of the glass. The entry holes were photographed with a Canon EOS 70D camera and an ABFO metric scale. Camera settings were set manually according to the lighting at the time of shooting. The diameters of the entry holes were measured with a digital caliper and the data analyzed for statistical significance using the One-Way Analysis of Variance (ANOVA) statistical test and a p-value of  $<0.05$  to indicate significance.

The findings will be presented and indicated that there was no statistical significance in the diameter of the entry hole in the targets, handgun caliber, grain weight, and firing distances used in this investigation. These findings may dispel the often-held myths related to the tested parameters. They will also assist in the evaluation, analysis, investigation, and reconstruction of shooting incident scenes which can be crucial information in deriving the truth and supporting or refuting eyewitness or suspect testimony in the courtroom.

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