



Active shooter in the pressurized environment setting

2023 UHMS ANNUAL SCIENTIFIC MEETING

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INTRODUCTION

- Healthcare facilities are not immune to active shooter events
- The hyperbaric environment creates unique challenges
- Little was known about how gunshots could damage monoplace chamber acrylic
- Does a breached pressurized chamber present additional threat to the patient or bystanders?

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RESEARCH ARTICLE

Gunshot damage to monoplace hyperbaric chamber acrylic

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Shooting a chamber

METHODS

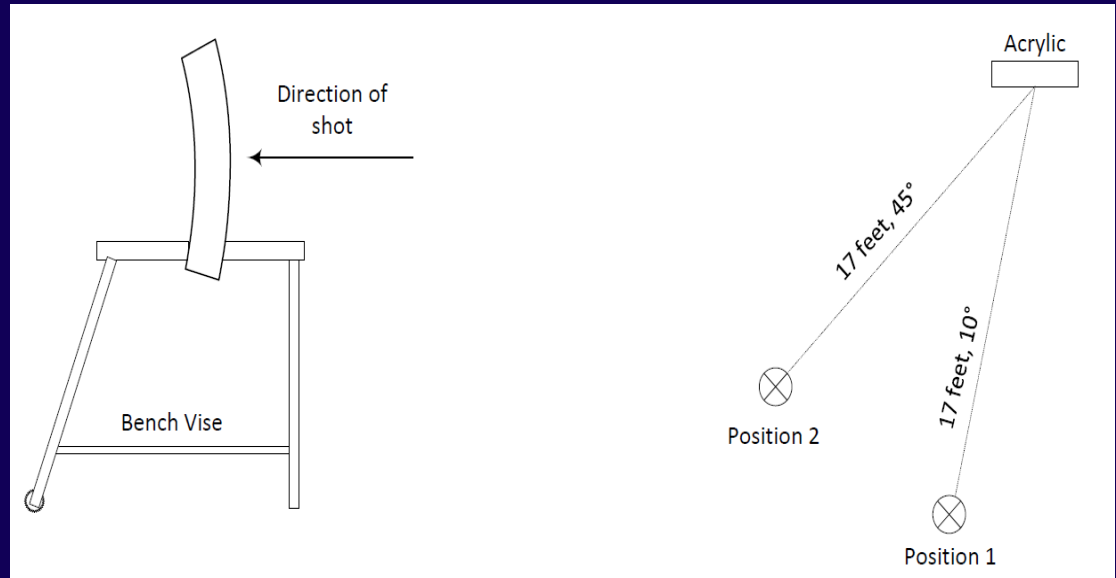
- Remote area, firearms allowed
- Expired 32-inch monoplace chamber
 - Pressurized with oxygen to 2 ATA
 - 9 mm, 45 cal pistol, AR15
- Acrylic chamber sections shot
 - 9 mm, 40 cal, 45 cal, PS90 (5.7 mm), AR15 (5.56 mm, 12 gauge - #4 low)



Shooting a chamber

METHODS

Acrylic sections:



RESULTS - Acrylic sections:

AR-15; 5.56 mm, 64 grain, FMJ



.40 caliber handgun; 180 grain, required only two shots to break apart.

9 mm, 147 grain, FMJ



RESULTS - Acrylic sections:



.45 caliber
handgun
230 grains

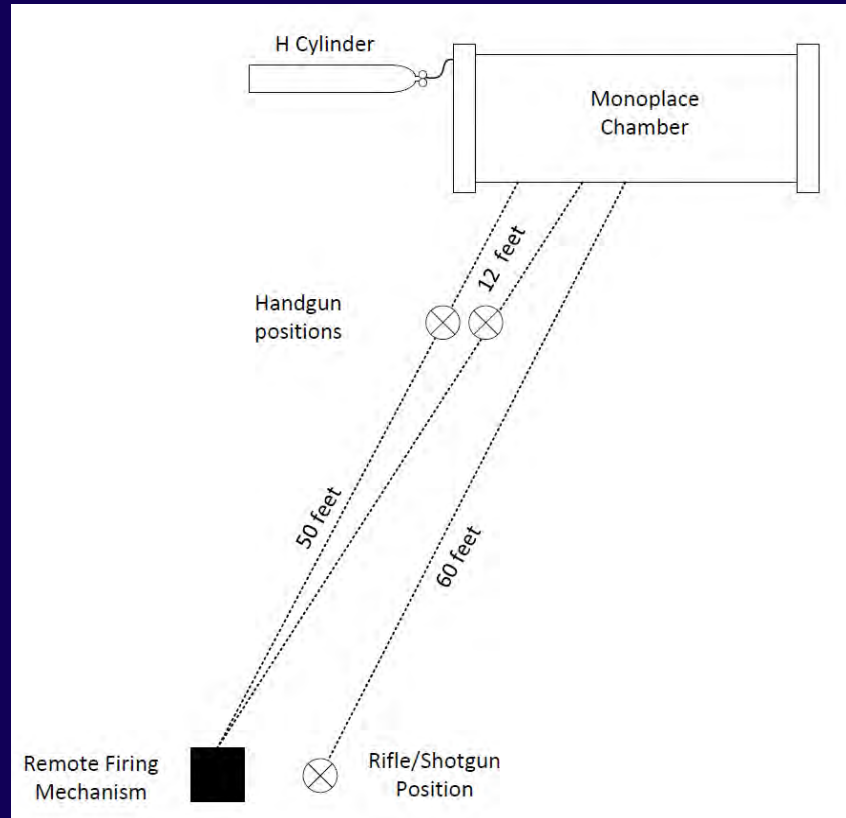
12-gauge shotgun, high brass, #4



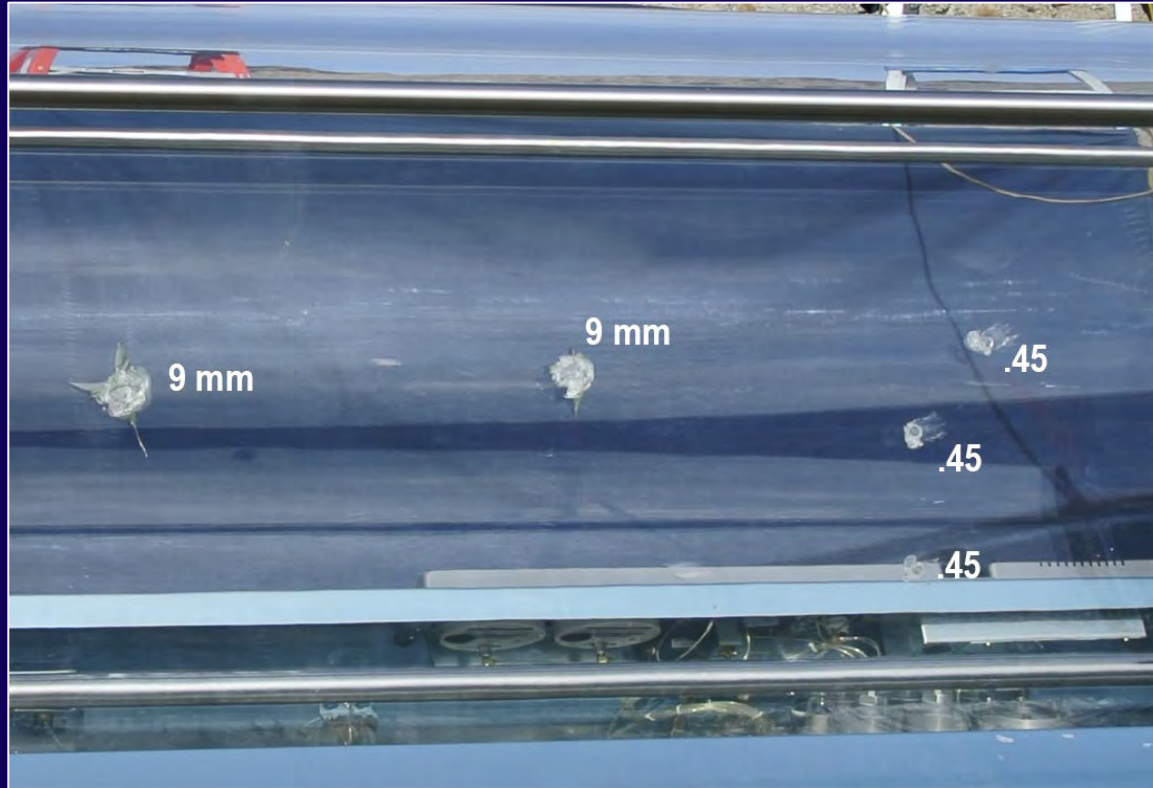
Shooting a chamber

METHODS

Pressurized
chamber:



RESULTS – Pressurized chamber:



Shooting a chamber

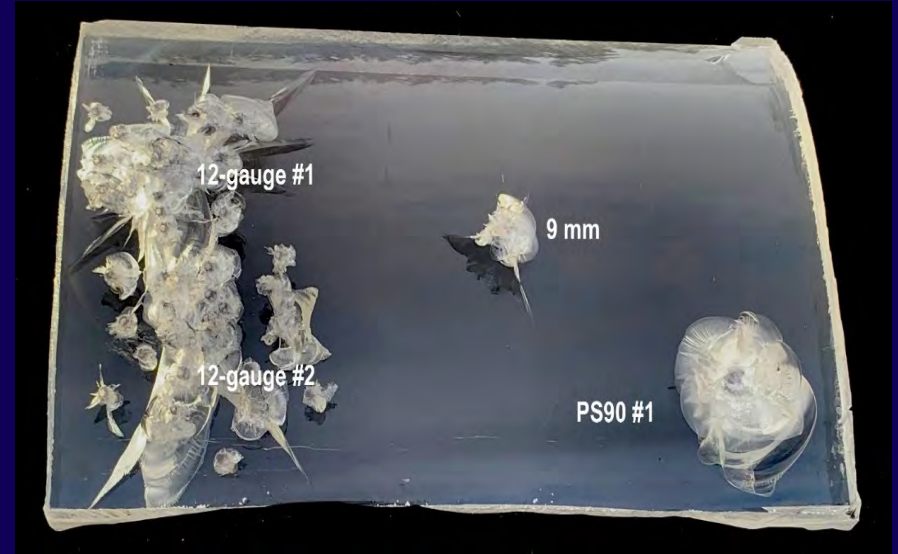
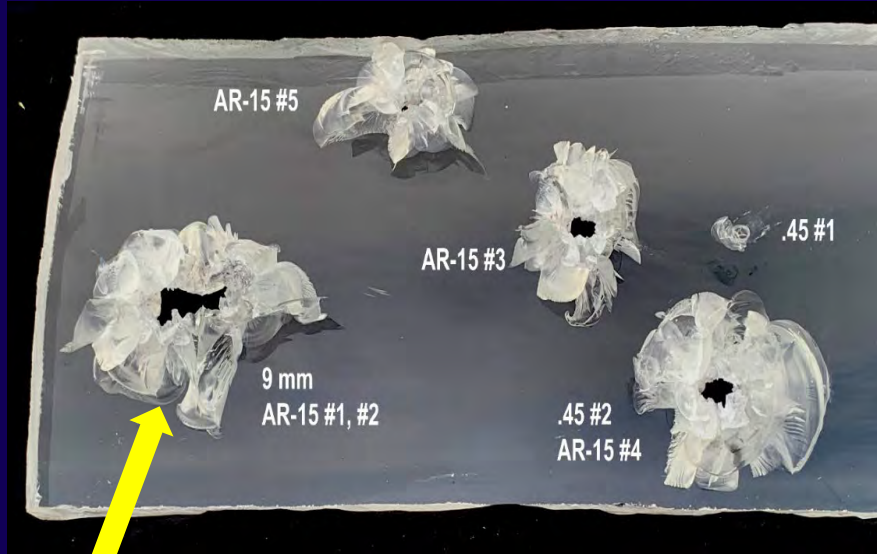


RESULTS – Pressurized chamber:

AR15,
40 grain
Penetrated
the chamber



RESULTS – Pressurized chamber:



Initial breach

Code Active Shooter



RUN

If you are by an exit and leaving will not increase your risk, this option is encouraged

Elevators and stairwells are likely to be UNSAFE options



HIDE

Use 'safe' rooms when possible. Turn out lights. Silence your phones. Barricade door. Create action plan in case the room is breached.

If you can get to one of the safe rooms or another hiding room do this if you can't run,



FIGHT

Use anything heavy, sharp, or unexpected as a weapon.

IV poles, Scissors, Hot Drinks, Chairs with wheels etc.

This action should only be chosen when the other two become unfeasible. Identify weapons in your vicinity and be prepared to use these.

Facility/department preparedness

- Updated policies and procedures – emergency procedures
- Active shooter drills – regular training
- Emergency response kits
- Fortifying physical security by locking doors and controlling access





Intermountain Medical Center HBO2



LDS Hospital HBO2



CONCLUSION

- This initial evaluation, limited to a 32-inch chamber, suggests that in a worst-case active shooter scenario involving a pressurized monoplace chamber there was no additional threat to bystanders beyond the significant risk of ricochet.
- Further investigation is warranted to validate these preliminary findings.
- Taking proactive steps can improve the safety of patients and staff.