INTRODUCTION TO FIREARMS FOR RESPONDERS

DISCLAIMER:

- This presentation contains photos of REAL scenes; some of which were local incidents.
- There are also a few graphic photos.

DISCLAIMER 2:

- The examples used in this class are inert and inoperable. No Live ammunition is allowed in this classroom for obvious reasons.

- Firearms used as examples here are locked/out by cable locks, and are therefore inoperable.

- **Lead Warning:** Discharging firearms in poorly ventilated areas, cleaning firearms, or handling ammunition may result in exposure to lead and other substances known to cause birth defects, reproductive harm, and other serious physical injury. Have adequate ventilation at a times. Wash hands thoroughly after exposure.

ABOUT THE AUTHOR……

- I'm with the Government.
  - …I'm here to help.
  - Employed by the City of West Des Moines as Deputy Chief of EMS

- Non-Financial Relationships:
  - Past President and Legislative Chair of the Iowa EMS Association
  - CIEMSD Training Committee Member
  - AHA State Advocacy Committee Member

- I do not have a financial relationship with any manufacturer of medical devices.
- I receive no financial gain from the sale of any medical device.

ABOUT THE AUTHOR…..

OBJECTIVES

- Learn to Recognize Firearm Related Hazards
- Learn how to Identify Various Firearms.
- Learn how to “filter”.
- Learn to Maintain Scene Safety.
- Introduction to Common Firearm Types
- Introduction to the projectile: Types, Form, Function, Evolution.

TAKEAWAY #1

There are few absolutes in Ballistics.

TAKEAWAY #2

The subject of ballistics seems to invite opinion.

GOOD INFORMATION:

- Publications
- SAAMI
- Actual Ballisticians

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HODGDON 2022 ANNUAL MANUAL
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HANDBOOK OF
CARTRIDGE
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PAPER
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MANUALS:

THE MODERN CARTRIDGE

- Single Projectile

- Multi-Projectile

- Specialty

CARTRIDGE (SINGLE PROJECTILE)

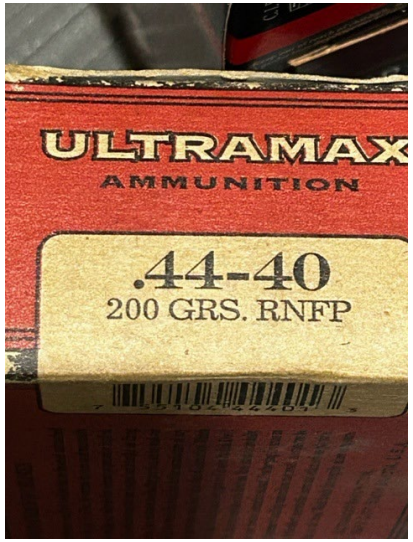
- Case
- Primer
- Powder
- Bullet

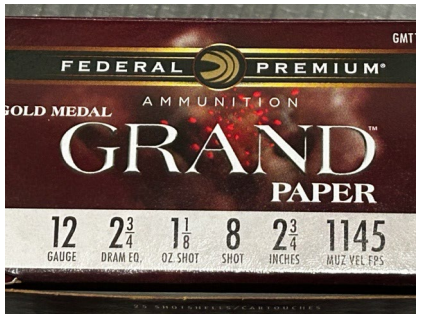
HOW TO IDENTIFY CARTRIDGE

Headstamp is your "Go To"

HOW TO IDENTIFY A CARTRIDGE

Headstamp not helpful??





OTHER PLACES TO LOOK:

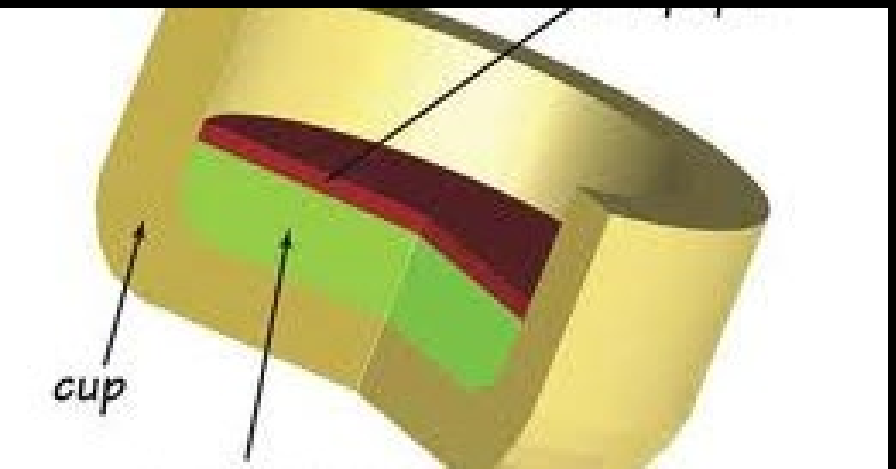
CARTRIDGE CASE

- Invention which Revolutionized Firearms

- Usually Brass. Sometimes other metal. New polymer cases emerging.

- Holds all components together.

- Many different sizes.



PRIMER

- Ignition Source
- Only “Explosive” part of a cartridge.
- Found at the Base of the Cartridge.

POWDER

- Not Explosive.
- Propellant.
- Different Types Depending on Burn Properties.
- Smokeless vs. Black

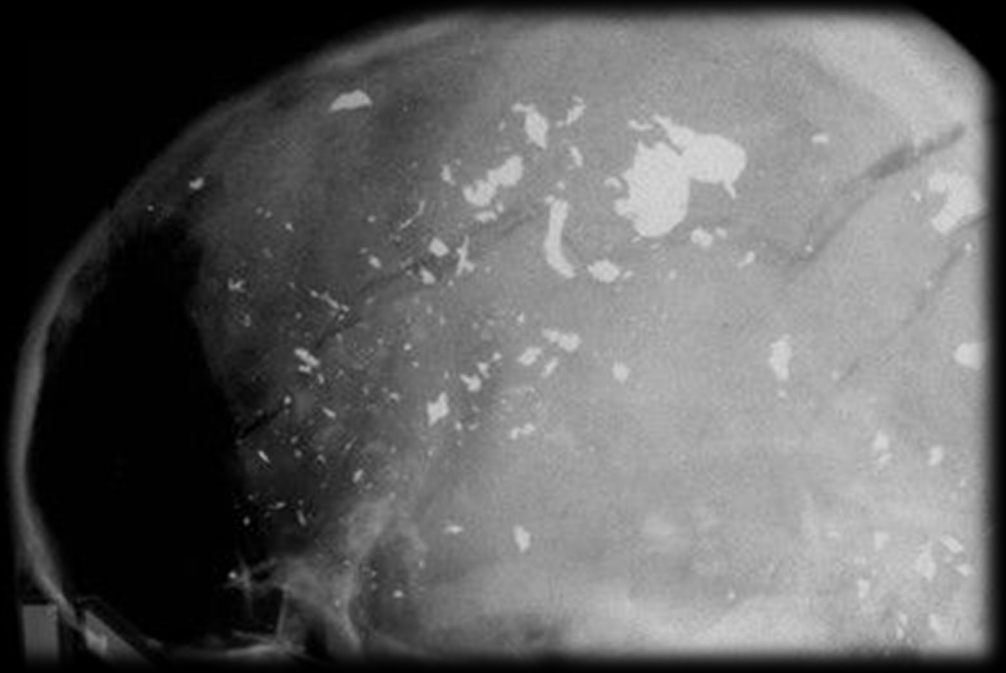
BULLET

- The Projectile
- Has Undergone a Dramatic Evolution.
- Types for Every Application

LEAD/SOLID

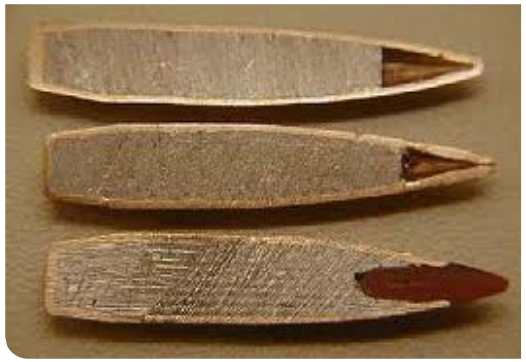
- First Used. Still Used.
- Generally Soft, Varying Hardness, Low Melting Point.
- Target Shooting and Large Game Applications
- Poisonous.

DEFORMATION OF SOFT LEAD



JACKETED

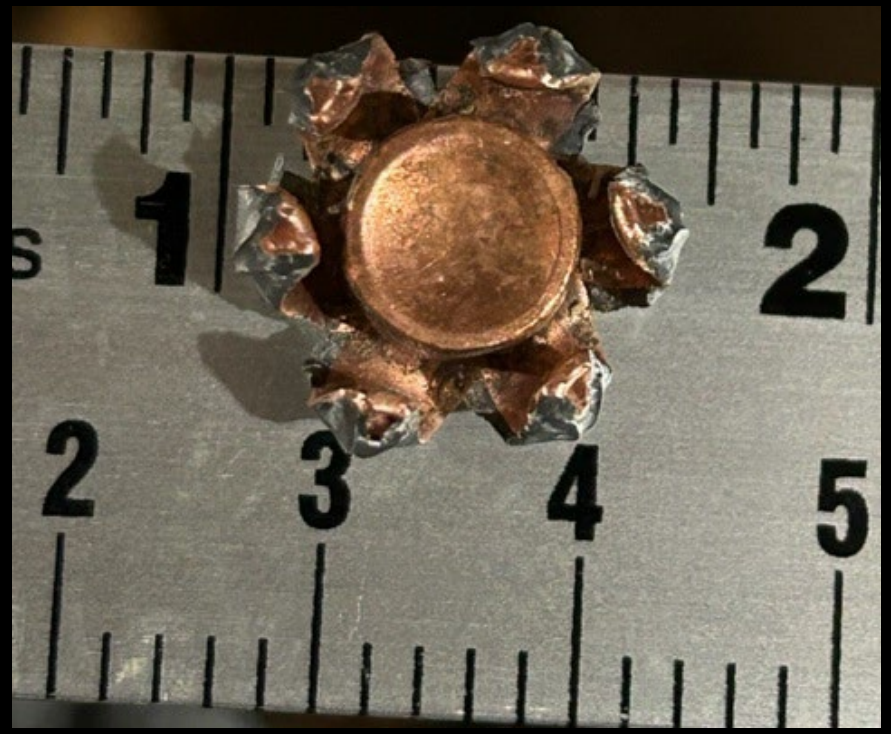
- Jacket made of harder metal, protects the lead from heat, pressure, and friction.
- Copper, Brass, Steel, or Gilding Metal
- Full or Partial
- Plated or Encased

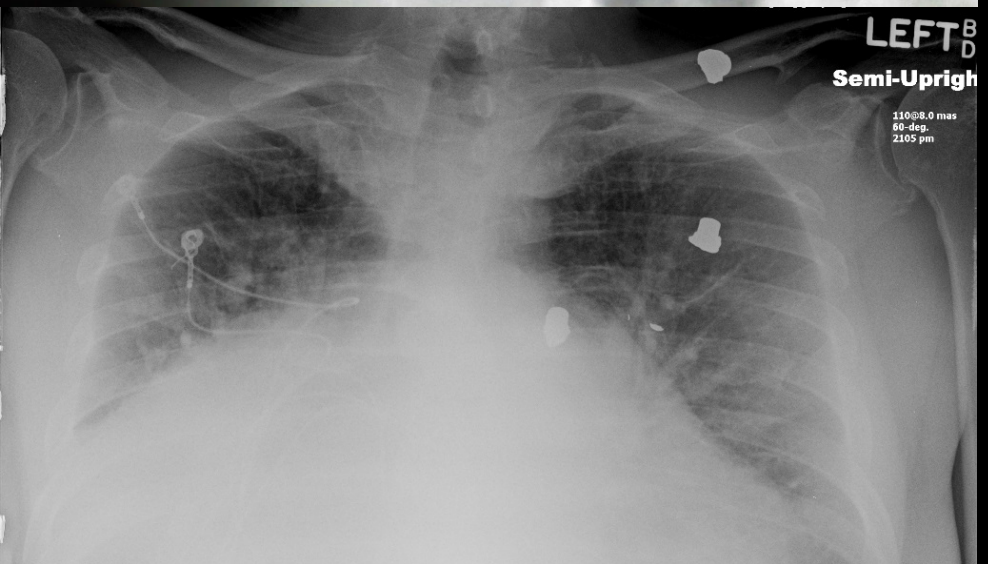


JACKETED BULLETS

HOLLOW POINT/TIPPED

- Hollow Point Designed to Expand.
- Extends Tissue Damage.
- Increasing Frontal Surface Area.

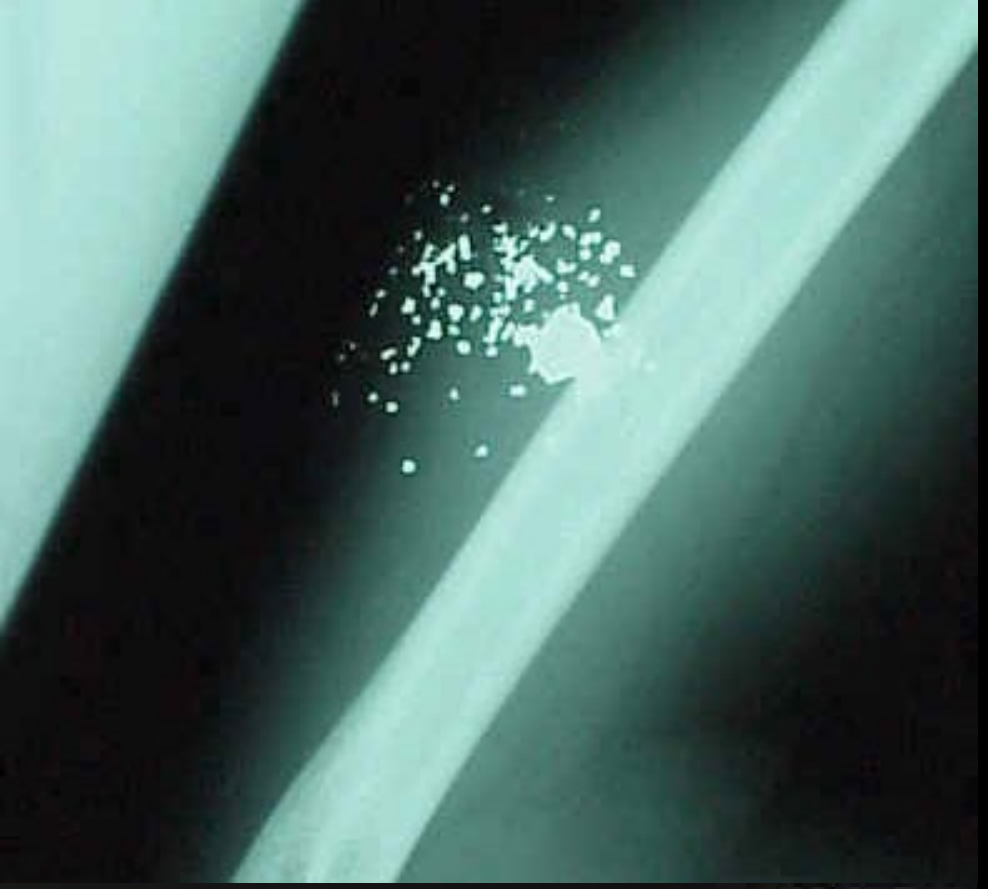




CONTROLLED EXPANSION

SPECIALTY

- Tracers
- Armor Piercing
- Frangible



FRANGIBLE

TRACER

ARMOR PIERCING



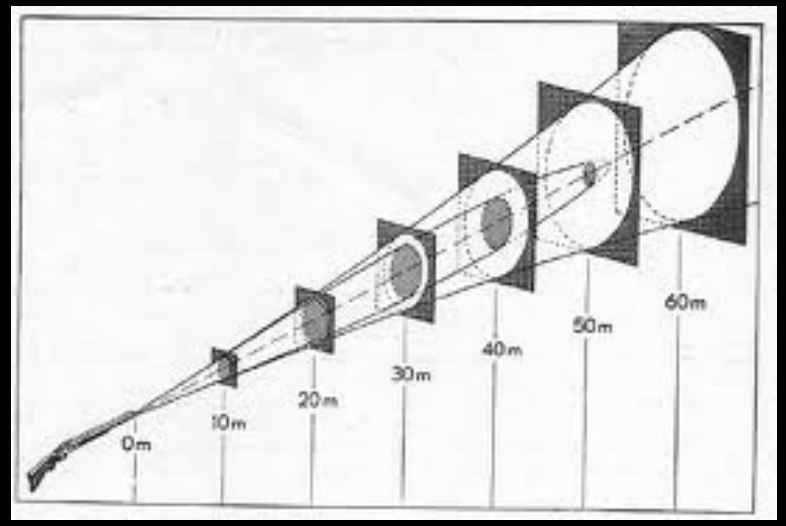

ARMOR PIERCING

SHOTGUN

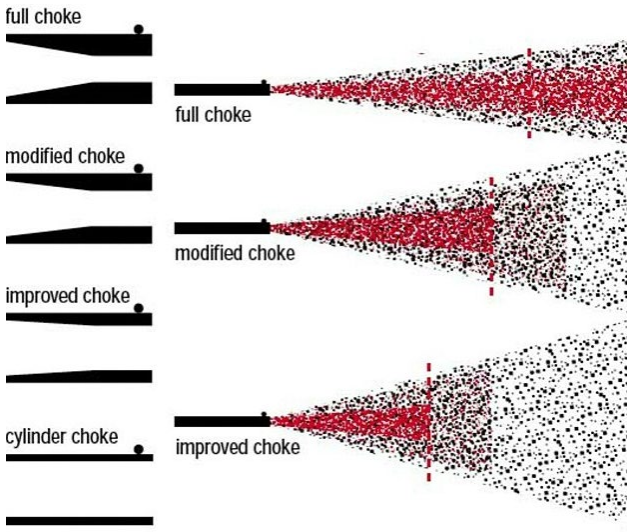
- “Gauge” refers to bore diameter.
- Multiple Payloads….

SHOTGUN PATTERNS

- Shotgun Spread…



- Never Absolute – Lots of variables

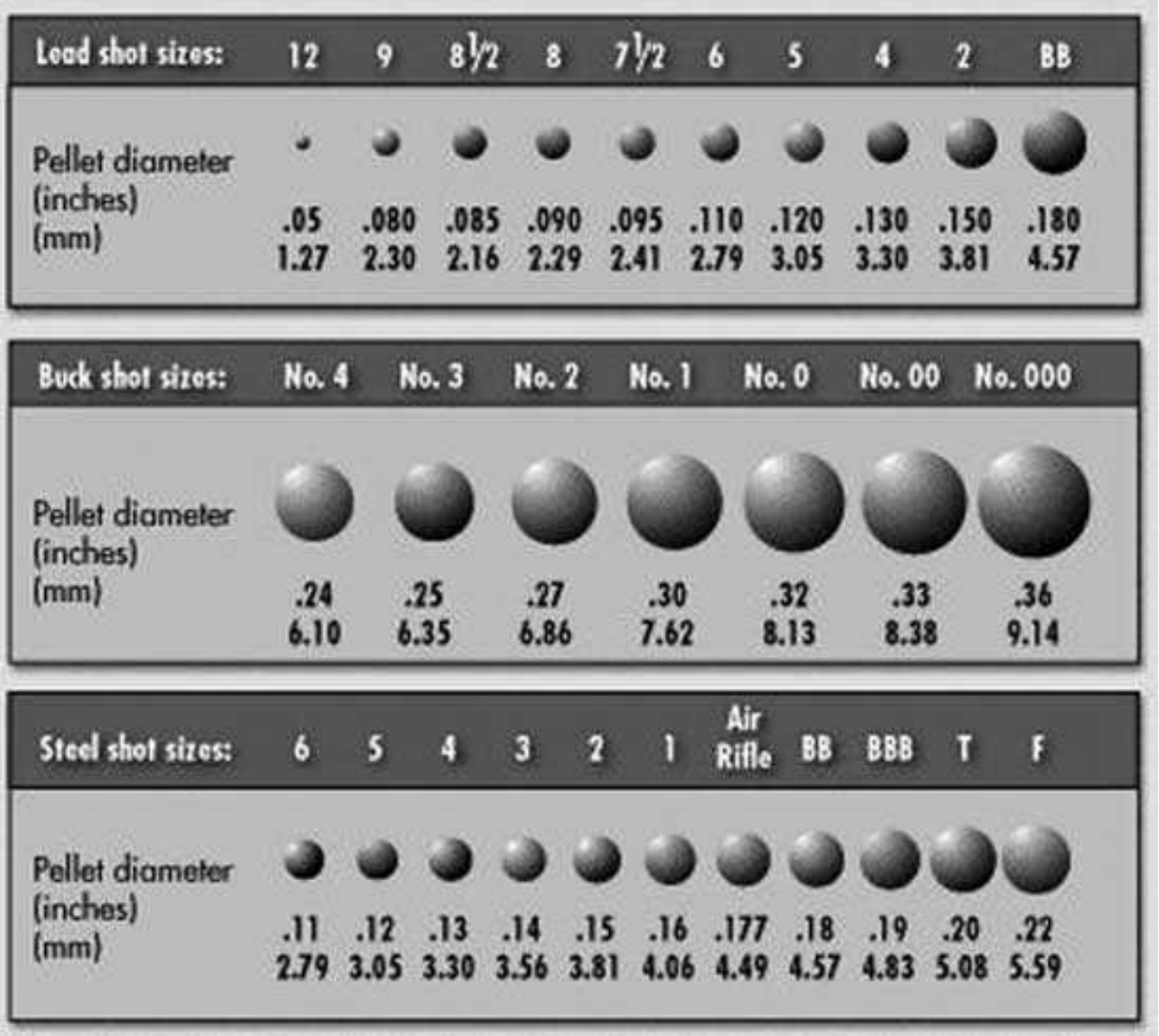


PATTERN VARIABLE

Choke

PATTERN VARIABLES

- Shot Characteristics
  - Size
  - Shape
  - Material
  - Payload



Lead shot sizes:	12	9	8½	8	7½	6	5	4	2	BB
Pellet diameter (inches)	.05	.080	.085	.090	.095	.110	.120	.130	.150	.180
(mm)	1.27	2.30	2.16	2.29	2.41	2.79	3.05	3.30	3.81	4.57

Buck shot sizes:	No. 4	No. 3	No. 2	No. 1	No. 0	No. 00	No. 000
Pellet diameter (inches)	.24	.25	.27	.30	.32	.33	.36
(mm)	6.10	6.35	6.86	7.62	8.13	8.38	9.14

Steel shot sizes:	6	5	4	3	2	1	Air Rifle	BB	BBB	T	F
Pellet diameter (inches)	.11	.12	.13	.14	.15	.16	.177	.18	.19	.20	.22
(mm)	2.79	3.05	3.30	3.56	3.81	4.06	4.49	4.57	4.83	5.08	5.59

PATTERN VARIABLES

Wad

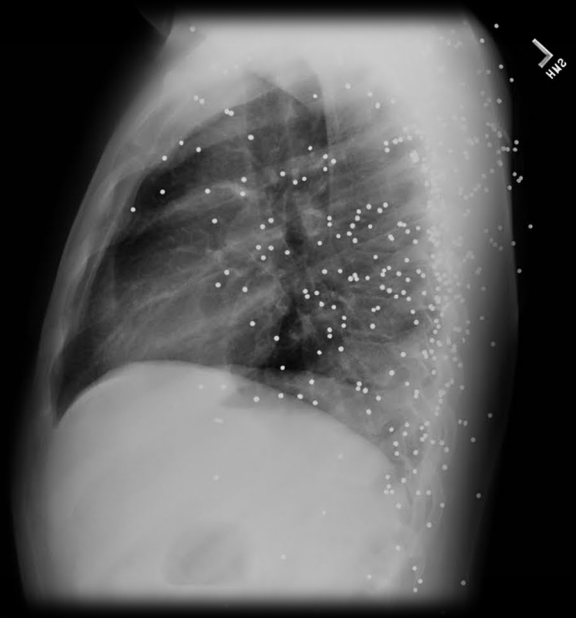
SHOTGUN CONTINUED

- Shot….Multiple Pellets
- Bird Shot (as many as 2,000 pellets)
- Buck Shot

SHOTGUN CONTINUED

- Slugs
- Single Large Projectile
- Devastating

SHOTGUN



SPECIALTY

- Less Lethal….

- Other….

3 FIREARM CATEGORIES

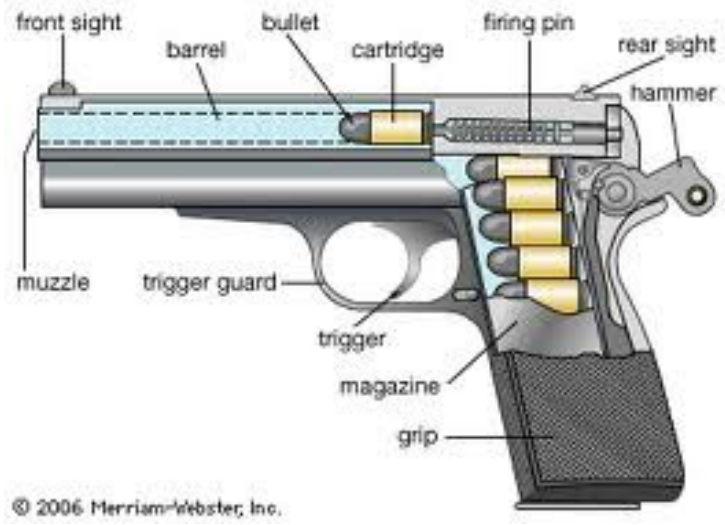
- Handgun

- Shotgun

- Rifle

HANDGUN

- Pistol
- Revolver
- Single Shot (Derringer)


front sight
barrel
bullet
cartridge
firing pin
rear sight
hammer
muzzle
trigger guard
trigger
magazine
grip
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PISTOL

REVOLVER

HANDGUN IDENTIFICATION

HANDGUN IDENTIFICATION

Pistol:

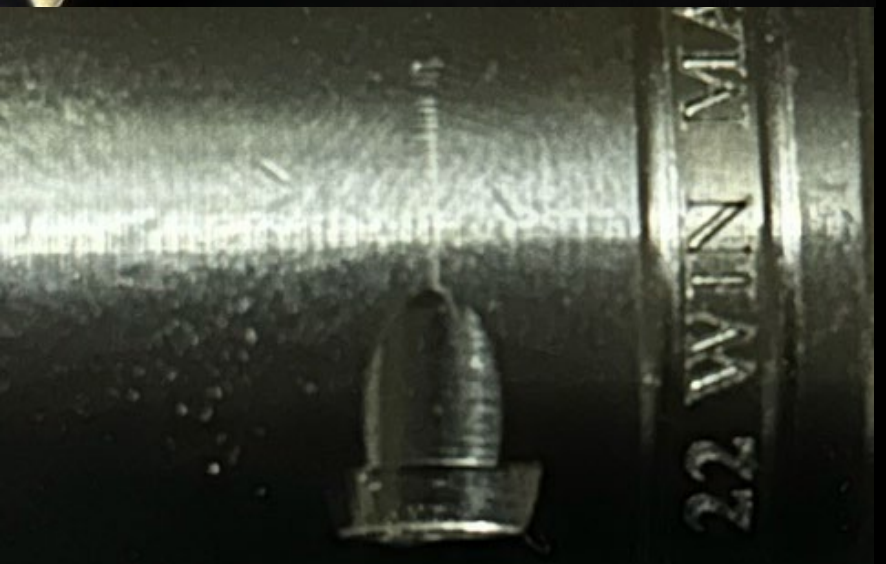
Look on Chamber or Barrel

HANDGUN IDENTIFICATION:

- Pistol
  - Look on Slide

HANDGUN IDENTIFICATION

- Pistol:
  - Look on magazine



HANDGUN IDENTIFICATION

- Revolver:
  - Look on Barrel
  - Look on Cylinder

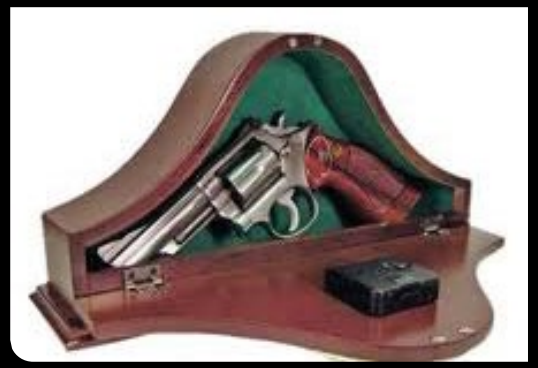
IDENTIFYING THE HAZARD (HANDGUN)

- Use your senses…..

- Hearing
- Sight
- Smell
- Feeling

SIGHT

- Concealed Carry more popular now than ever.
- Common Places to conceal….



- And Some More….

SIGHT CONTINUED

Signs on Scene….

SIGHT CONTINUED

- Patient Injuries…..

SIGHT CONTINUED

- Behaviors….
- The “Security Feel”
- Tenting
- The “Bulge”
- Body Positioning

- **Watch the Hands!!**

SENSE OF FEEL

- Feeling of the gun under clothing
- Unusual Weight in pockets or bags.

CONCEALED CARRY

- How do you react if you find a weapon?

- Some things for consideration….
  - Is it safely positioned?
  - Are you comfortable?
  - Have a game plan.

SHOTGUN

- Break Action
- Pump
- Auto

SHOTGUN IDENTIFICATION

- Look on Barrel

SHOTGUN CONTINUED

- Identifying the Hazard…..
  - Hearing
  - Sight
  - Smell
  - Touch

SHOTGUN CONTINUED

- Signs on Scene…..

RIFLES

- Single Shot
- Bolt Action
- Semi-Auto

RIFLE IDENTIFICATION

- "Traditional Rifle"
  - Look on Barrel

RIFLE IDENTIFICATION

- AR Style Rifle
  - Lower Receiver may not be accurate

RIFLE IDENTIFICATION

- AR Style Rifle
  - Lower Receiver may not be accurate

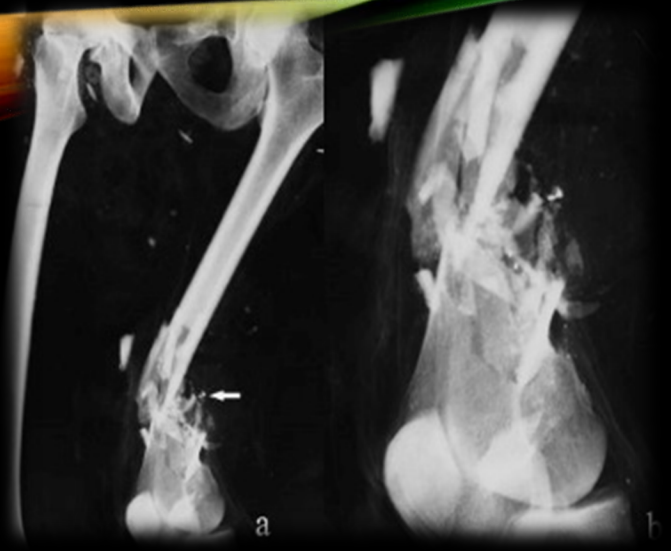
RIFLE IDENTIFICATION

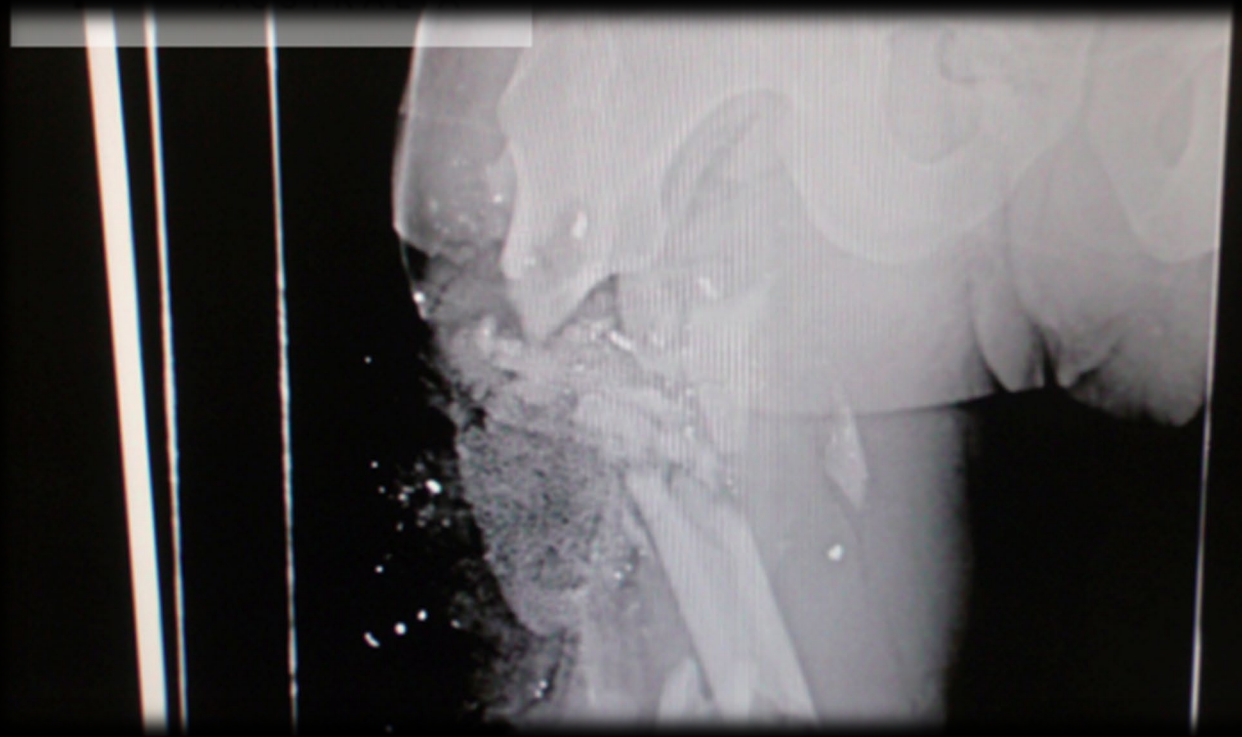
- AR Style Rifle
  - Look on Barrel

RIFLES

- Identifying the Hazard…
  - Hearing
  - Sight
  - Smell
  - Feel
    - Effective Range?

HIGH VELOCITY…





A SIDE ON ENERGY……

Kinetic Energy

- "Speed Kills"
- KE=((V^2)/450400)(Mass)

Pistol vs. Rifle

- 45 Auto
  - At muzzle (point blank)
  - 230 grain bullet traveling at 900 fps (Feet per Second)
  - 413.78 foot-pounds energy
- .308 Winchester (7.62x51)
  - At muzzle
  - 168 grain bullet traveling at 2660 fps
  - 2640.15 foot-pounds energy

HOW FAR IS SAFE?

- Same .308 Winchester at 600 yards
  - Bullet has dropped 84 inches. (7 feet)
  - A 10MPH full-value wind blows the bullet 30.4 inches.
  - Velocity is 1695 FPS
  - Energy is 1073 foot-pounds.
  - That is 2.5 times greater than a 45 Auto at point blank range.

IS 600 YARDS REALISTIC?

STAYING SAFE

- Not entering dangerous area is key.

- Cover if needed.

QUESTIONS?

BLANK

GUNSHOT WOUNDS

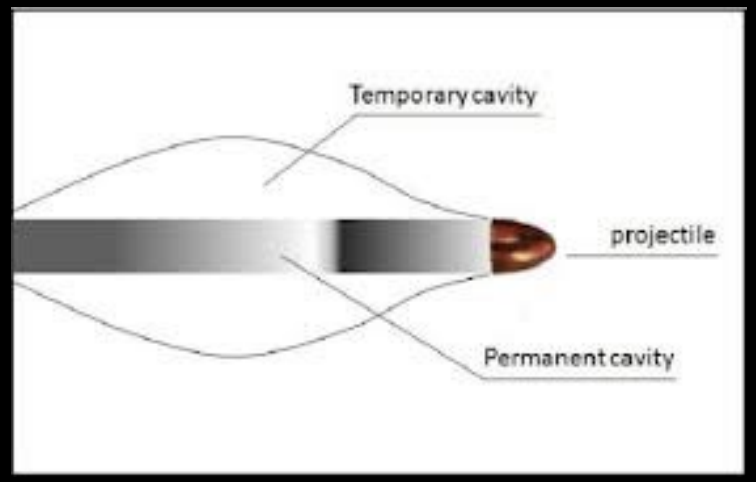
- 2 Energy Levels….

- Medium
  - Pistols
  - Some rifles (MV < 1200 FPS)
  - Temporary cavity 3-5 times the caliber of the bullet.
- High
  - Rifles with MV > 2000 FPS
  - Temporary cavity 25 times greater than the bullet caliber.

- Where do Shotguns Fall?

GUNSHOT WOUNDS

- Permanent "Crush" Cavity
  - The tissue destroyed by contact with the projectile…. Determined by the width of the projectile.

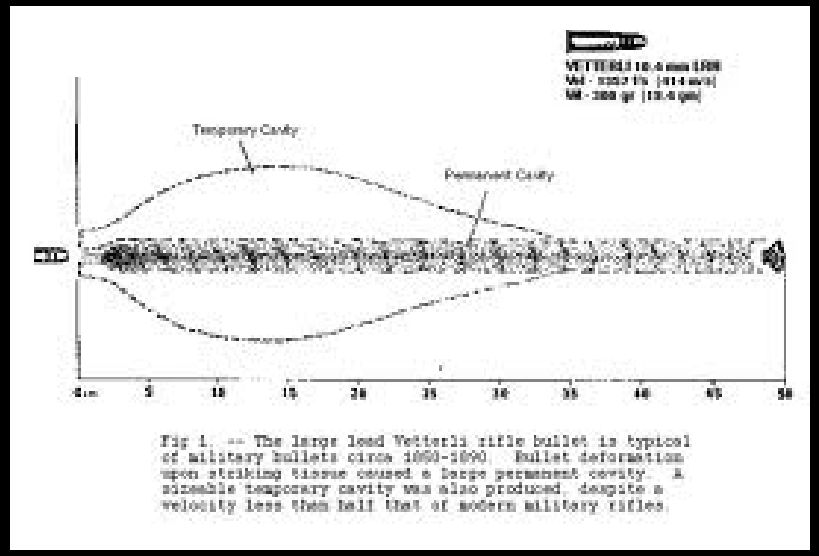


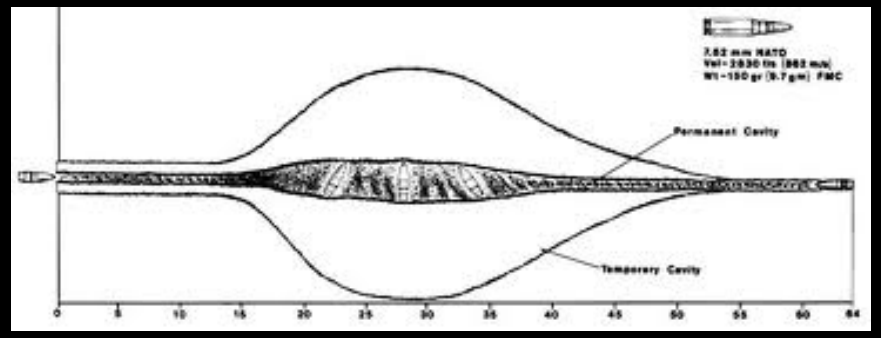
GUNSHOT WOUNDS

- Temporary Cavity
  - Tissue which is indirectly damaged. Caused by the “shock wave” of the projectile. Affected by projectile type and behavior.

GUNSHOT WOUNDS

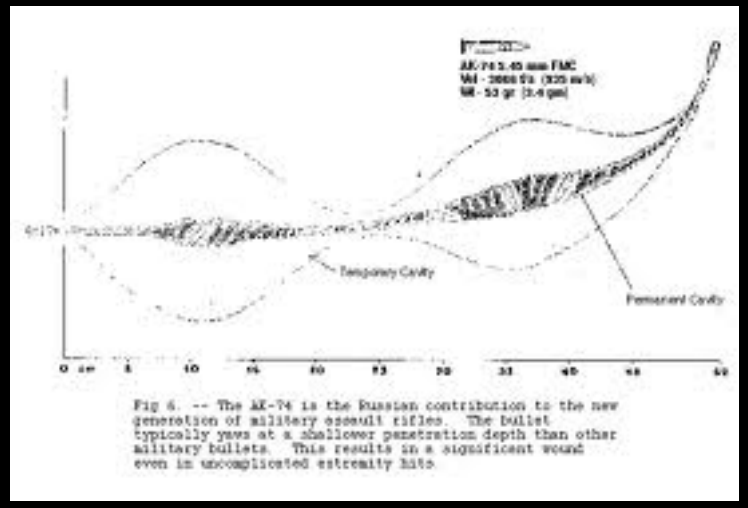
- Examples of Cavitation.

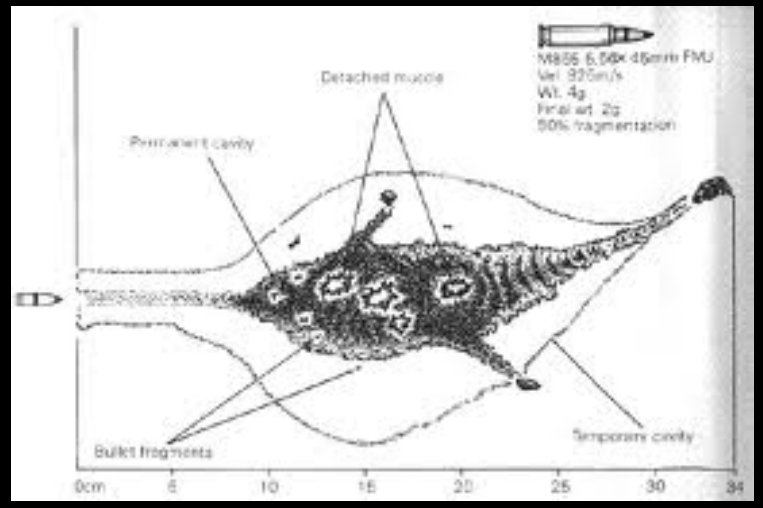




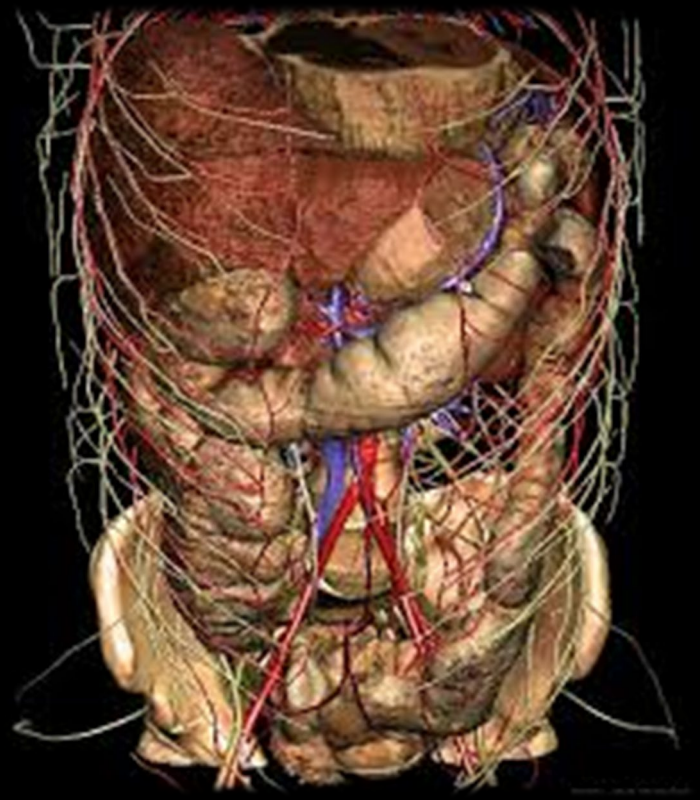
GUNSHOT WOUNDS

- Examples of Cavitation…





GUNSHOT WOUNDS



Close counts in Horseshoes, Hand Grenades, and ….. GSW?

GUNSHOT WOUNDS

- Entrance and Exit Wounds…
  - What is between the 2 holes
  - What is underneath either?
  - What makes you an expert?

- Does it matter which direction.
  - Don’t document entrance/exit
  - Only the location of injuries.

GUNSHOT WOUNDS

- Handgun wounds.
  - Easily maneuvered
  - Easily Concealed
  - Medium Energy
  - Close Range

GUNSHOT WOUNDS

- Shotgun Wounds
  - Devastating Power at close range
  - Different projectiles with different effects.
    - Always think the worst….

GUNSHOT WOUNDS

- More Shotgun Wounds…..

GUNSHOT WOUNDS

- Rifle
  - Very High Energy Weapons
  - Long Range
  - Injuries vary based on many factors
  - Large Temporary Cavity.