Hunting-Related Injuries in AR, 2001-2010

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• I have no financial interest in any of the products or companies represented in the presentation.
  – Their inclusion is not meant as an endorsement of any particular product, but rather as a general example of what types or products are in use.

• I freely borrowed many publicly accessible images for this presentation which is given for educational purposes
Outline

• Background
• Past and Ongoing Safety Efforts
• Review of 2001-2010 Data
• Strengths and Limitations
• Recommendations
• Discussion

Hunting in Arkansas

• Extremely popular tradition for outdoor enthusiasts and conservationists

• Nearly 450,000 resident hunting licenses are sold in Arkansas annually
  - Over 230,000 licenses allow the hunter to harvest deer
Prominent Hunter Conservationists

Thomas Jefferson
Theodore Roosevelt
John James Audubon
Henry David Thoreau
Aldo Leopold
John Steinbeck
Jimmy Carter
Morgan Freeman

Myths About Hunting Injuries

• Drunks firing bullets wildly
• ‘Trigger-happy’ teen misidentifying quarry or swinging on game
• In truth….
  - ≤ 50% are firearm related
  - Most of the firearm injuries are self-inflicted
  - > 50% are related to falls, predominantly from tree stands
Tree Stands

- Elevated platforms (typically 10-25 feet) that allow hunters better vantage point to see quarry

- Helps to conceal hunter from animal’s normal field of vision and sense of smell

- Helps hunters to see each other to decrease the likelihood of a accidental gun shot wound

Tree Stand Hunting

- Huge increase in use since 1980 when hunting magazines popularized their use and success

- Soon afterward, injury patterns became recognized and / or reported
  - Recent study estimates 7% of tree stand hunters have sustained a tree stand-related injury\(^1\)
    - 22% required medical attention

- Commercial stands have become much safer
  - Further, manufacturers of non-enclosed stands are now including safety harnesses

\(^1\) http://www.ihea.com/_assets/documents/Elevated_StandReport.pdf
Hunter Education

- Initiated in Kentucky in 1946
- First mandated in New York in 1949
- International Hunter Education Association (IHEA) formed in 1972
  - Now mandated in all states

- Mandated in AR since 1985 for any unsupervised hunter born in 1969 or later
  - Children under 16 may hunt with a HE-certified adult ≥ 21 yrs of age
  - Consists of 10 hr class and test, designed at 6th grade level, but there is no formal age requirement

Hunter Orange

Preferred

Legal, but not recommended

Mandated in AR since 1996 for all firearm hunters except those pursuing turkeys or migratory / upland birds

Chartreuse (i.e.: ‘hunter safety green’) is allowed too
Data Source for Presentation

- Consists of all hunting-related incidents reported to Arkansas Game and Fish Commission officers from 2001-2010
- Maintained in IHEA database and shared on request
- Best information available for Arkansas
  - Nevertheless, it has limitations
    - Passive
    - Biased to include most severe injuries
    - Certainly underestimates overall injury burden

Hunting-Related Injuries by Year
Reported in AR, 2001-2010, AGFC

n= 160
Hunting-Related Injuries Reported by Year and Vital Status in AR, 2001-2010, AGFC

- Fatal: n=160
- Non-fatal

Characteristics of Hunting Related Injuries in AR, 2001-2010, AGFC

- Weapon-related (n=113)
- Fall-related (n=69)
- Fall and Weapon-related (n=16)

Total n=160
As categories are not mutually exclusive, percentages add up to >100%
Tree Stands Falls & Deer Season

Deer Season Injuries

- Fall from Treestand: 60%
- Treestand and Weapon-related: 32%
- Weapon Injury: 8%

All Other Hunting Season Injuries

- 95%
- 3%
- 2%

Hunting-Related Injuries by Weapon Type in AR, 2001-2010, AGFC

- Shotgun: 63% (56% of n=113)
- Rifle: 39% (34% of n=113)
- Handgun: 2% (2% of n=113)
- Muzzleloader: 2% (2% of n=113)
- Unknown Gun: 2% (2% of n=113)
- Bow: 5% (4% of n=113)
Do the Underlying Reasons for the Injury Differ by Weapon Type?

Sex of Shooter in Hunting-Related Injury

- Male
- Female
- Unknown

n= 113
Potential Associations Examined

- No obvious association of injuries with:
  - Gender
  - Weather
  - Cover
  - Lighting
  - Time of Day
  - Age of Shooter
- Strong association with close proximity (even when not self inflicted)

Age of Victims and Shooters in AR, 2001-2010, AGFC

Total n=151, Missing 9

Age of Shooters and Victims vs Number of Victims vs Number of Shooters

Graph showing the distribution of age and number of victims and shooters from 2001 to 2010 in AR, indicating a trend in the number of victims and shooters across different age groups.
Is the Surrounding Cover a Factor?

Total n=100, Missing = 13

Distance of Victim from Shooter in Hunting-Related GSWs in AR, 2001-2010, AGFC

Total n=92
Unknown or missing = 21
Self Inflicted Hunting Injuries in AR, 2001-2010, AGFC

Is Hunter Education Training a Factor?

Was the Shooter HE certified?

Was the Victim HE certified?

Total n = 76, Unknown or missing = 12

Total n = 147, Unknown or missing = 13
Is Weather a Factor?

Total n= 142
Unknown or Missing = 18

Is Ambient Lighting a Factor?

total n= 71
Unknown or missing = 8
Is Alcohol a Factor?

- Of the 160 incidents, 104 had data on alcohol
  - Only 5 involved alcohol (~3% overall)
    - Remaining 56 reports did not mention alcohol
      - 3 of the 76 GSWs (~2% overall) involved alcohol
        - Two hunters fell while walking and shot themselves.
        - One hunter fell and killed another hunter in his party while crossing a ravine.
        - None involved misidentifying quarry or swinging on game.
      - 2 of the 28 non-GSW hunting-related injuries involved alcohol (~1% overall)
        - One fell while climbing down a tree stand ladder.
        - One fell out of his stand. He was not using a safety harness.
    - Both stands were homemade.

Weapon-Related Hunting Injuries

- Can be any location or severity

- If self-inflicted, there is a tendency to involve the lower extremities

- If not self inflicted – there is no real pattern

Typical Fall Injuries

- Contusions, abrasions
- Lacerations
- Penetrating trauma
- Dislocations (~13%)\(^1\)
- Long bone or vertebral fractures (~38-73%)\(^1,2\)
- Closed head injuries / Concussions (~18-27%)\(^1,3\)
- Spinal cord injuries resulting in chronic functional impairment (~10-23%)\(^2,3\)
- Death (~7-12%)\(^1,3\)

* Also Suspension Trauma / exhaustion asphyxiation


Suspension Fatality - from Exhaustion Asphyxiation

In 2004, Consumer Product Safety Commission has called for ban of waist belt safety restraints after 8 suspension fatalities in single year.


How do Tree Stand Falls Happen?

- 60-80% when entering or exiting stand\(^1\)\(^-\)\(^2\)
- 30-50% due to stand / ladder failure (or the tree) \(^2\)\(^-\)\(^4\)
  - Vast majority (83%) of stand failures are in home-made stands
- Remaining falls are due to a variety of factors
  - Inattention
  - Falling asleep and out of stand
  - Slipped or lost footing
  - Lack of safety or shooting rail
  - Many other possibilities

\(^1\) Rose et al. J Wilderness Med. 1994; 5:382-388
\(^3\) Urquhart et al. South Med J. 1991;84:686-688

Types of Tree Stands

- Commercial
  - Ladder
  - Box
  - Hang on
  - Climbing
  - Tripod
- Home-made
  - Wide variety of forms and quality
Ladder-style Tree Stands

Box-style Stands
Hang-on Tree Stands

Climbing Tree Stands
Tripod Stands

Homemade (The Good)
Homemade (The Bad)

Homemade (The Ugly)
Really?

Harnesses & Descent Control Systems
You can’t prepare for everything

Conclusions

• These data highlight the importance of several mechanisms in hunting-related injuries

• They allow examination of trends
  – Especially in serious or fatal injuries and in GSWs

• They do not provide precise estimates of the numbers of mild or moderate injuries
  – Likely a large underestimate of fall injuries
Next Steps / Ongoing Questions

• AGFC will provide the presenter aggregate demographic data from their hunting license roster

• Ongoing questions:
  – Are shooters representative of licensed hunters?
  – Is lack of HE certification a risk factor for causing an injury?
  – Why has there been a recent decrease in reported injuries?
  – What proportion of injuries launch a AGFC incident report?
  – How many people use tree stand safety equipment?
  – Would other existing data sources compliment this analysis?

Recommendations (1)

1. Take a hunter safety course and follow all firearm safety rules
2. Wear ‘high visibility’ blaze orange clothing when hunting during a firearm deer season
3. Do not use alcohol or drugs while hunting
4. Use only high quality (TMA-approved) commercial stands, and do not modify them
5. Do not use an elevated stand if you are unsteady or fatigued
Recommendations (2)

6. Place stands only in mature, straight trees
7. Inspect all stands (commercial and homemade) and the trees to which they are attached yearly, and do not use them if they are unsound
8. Use a commercial safety harness at all times - do not use a rope or belt around the waist
9. Do not place stand higher than 20 feet off the ground
10. Always maintain three points of contact when ascending and descending the stand

Recommendations (3)

11. Always use a haul line to bring your gun or bow into the stand
12. Hunt with a partner (and know where each other is located)
13. Dress appropriately for weather conditions
14. Have the ability to contact others in an emergency (cellphone, walkie talkie, emergency GPS beacon, etc)
15. Maintain good physical health with regular exercise prior to hunting

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Discussion