

**2018 ACMT Annual Scientific Meeting  
FIT MedTox Shark Tank Research Forum**

**Presentation 6**

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**Title:** Retained Bullets and Lead Toxicity - Moving Forward

**Background:** Lead toxicity may occur in cases where bullets or bullet fragments are retained in the body. It is more frequently, but not exclusively, seen in cases where the bullets or fragments are lodged in bone, near or in joint or serosal surfaces, found within fluid-filled cysts, associated with bone fractures, or during times of rapid bone turnover (eg. pregnancy, osteoporosis, or immobilization).

Mobilization of lead from an embedded source may elevate blood levels and cause toxicity. Previous literature has demonstrated the significance of retained bullets in patients who have sustained gunshot wounds, with symptoms ranging from fatigue, weakness, neurologic sequelae, to death.

There are a multitude of variables affecting the rise in lead levels in such patients, rendering clear guidelines on when to monitor blood lead levels or remove bullets/fragments difficult to establish.

**Aim:** To establish guidelines for follow up in patients with retained bullets in relation to lead toxicity, more specifically the need for:

- Obtaining baseline lead levels on patients whose bullets do not require surgical removal on presentation.
- Periodic follow up of blood lead levels for a set period of time.
- Reassessment according to patient clinical status (should any of the risk factors change).
- Identifying possible indications for surgical removal of bullets/fragments.

**Methods:** We will identify and recruit patients with known retained bullets/fragments from affiliated outpatient clinics as well as those who visit the emergency department and measure their blood lead levels documenting:

- Presence or absence of lead toxicity symptoms
- The nature of their injury including timing, location, and number of bullet fragments
- Presence of risk factors that may induce mobilization of lead from an embedded source (pregnancy, lactation, osteoporosis, immobilization, hyperthyroidism, bone fractures)
- Statistical significance testing to investigate whether risk factors are associated with a greater risk of lead poisoning.

**Limitations:** Symptoms of lead poisoning are often non-specific. The retrospective nature of the study may result in selection bias as only patients who present to the ED or the clinic are enrolled.