

Polonium-210

To the Editor,

We read with interest the article by Le concerning Alexander Litvinenko's exposure to and subsequent death from polonium-210 [1]. Radiation as a source of illness is perhaps not as familiar a topic for many of us as best demonstrated by the delay in Litvinenko's diagnosis. While the review of acute radiation syndrome was well done, we would like to clarify some ideas that were expressed.

Litvinenko's episode cannot correctly be described as acute radiation syndrome (ARS). ARS is a brief exposure to a large amount of radiation from an outside source. Litvinenko was contaminated with polonium, which became incorporated into his tissue. It is well known that polonium has a limited (10%) absorption from the gut and 5% of this is deposited in bone marrow. Model predictions by Harrison estimates a steady increase in radiation exposure as time passes [2]. (See figure) Quite different from the ARS patient who experiences a one-time dose of radiation, the individual unfortunate enough to consume polonium is exposed to progressively more radiation in the bone marrow. Couple this to the lack of an adequate chelating agent post-exposure and the likely futility of colony stimulating factors (that might otherwise stimulate unexposed or minimally exposed marrow) and the patient may only be expected to deteriorate [3].

The review also suggests that polonium is difficult to produce. Sadly, this is not the case. A relatively simple chemical procedure may be used to isolate polonium from commercially available anti-

static devices that use polonium to ionize the air around materials that have developed a static charge to "fill in" missing charges [4].

That polonium may be an unlikely candidate for large-scale dispersal and contamination does not diminish its ability to terrorize a society where jet fuel and fertilizer have already been employed with dreadful success.

Joseph Rella, MD

Assistant Professor
Department of Surgery
New Jersey Medical School
rellajg@umdnj.edu

Dimpi Kalira, MD

Resident in Emergency Medicine
New Jersey Medical School

REFERENCES

1. Le MH. Polonium 210 exposed. *J Med Toxicol.* **2007**;3:82–83.
2. Harrison J, Leggett R, Lloyd D, Phipps A, Scott B. Polonium-210 as a poison. *J Radiol Prot.* **2007**;27:17–40.
3. Bogdan GM, Aposhian HV. *N*-(2,3-Dicmercaptopyryl) phthalamidic acid (DMPA) increases polonium-210 excretion. *Biol Metals* **1990**;3:232–236.
4. Azure MT, Howell RW. Simple isolation of polonium-210 from silver. *Appl. Radiat. Isot.* **1994**;45:637–638.

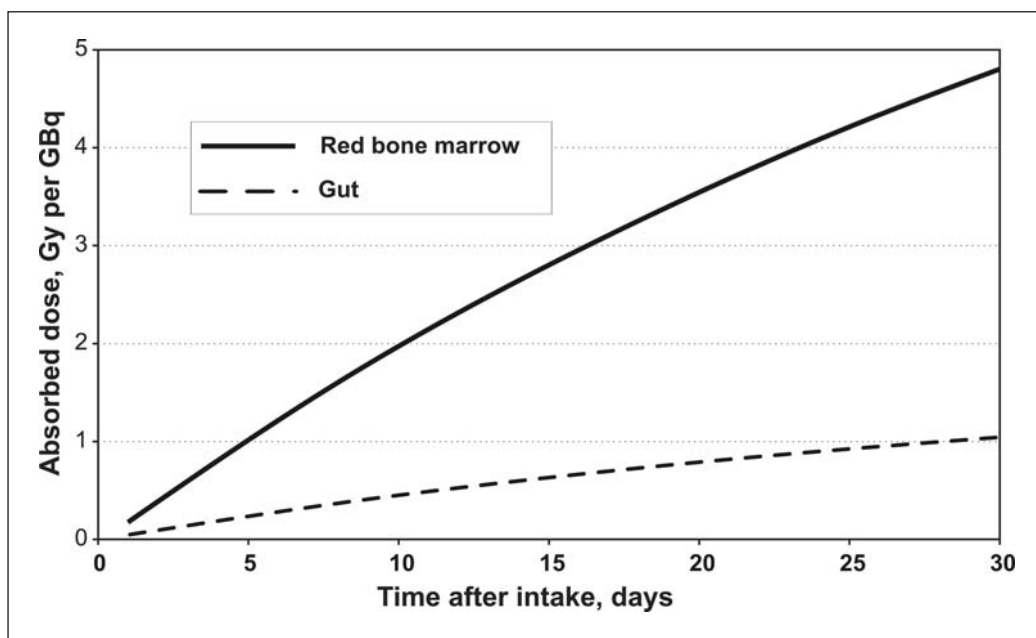


Figure. Cumulative doses to the red bone marrow and regions of the alimentary tract of a reference adult male after ingestion of ^{210}Po assuming 10% absorption to blood. Reprinted with permission from Harrison J: Polonium-210 as a poison. *J Radiol Prot* 2007;27:17–40.