

LETTER TO THE EDITOR

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Hazards of Natural Rubber's MBT and Latex Contact in Injections

I commend Dr. Davenport's group for a re-awakening of the decades-long issue of natural rubber contact since rubber seals were first used in drug ampoules many decades ago. Nonetheless, there persists almost total unawareness of MBT (mercapto-benzothiazole's) nature, insidious presence, and its pathophysiology—in the medical, dental, and nursing literature. MBT is a catalyst used to create cross-linkages between adjacent long one-way-stretch molecules and to create the all-way-stretch elasticity and toughness of natural rubber. MBT is not used in synthetic pharmaceutical rubber manufacturing.

A 2011 book, "The Nurses are Innocent – The Digoxin Poisoning Fallacy", is about MBT. The first half deals with MBT as an IgE allergen, causing hives, flushing, laryngeal edema, and death. The second half deals with MBT as a toxin in a significant Canadian medicolegal case. Allergenicity and cumulative toxicity are because MBT binds to plasma proteins. MBT reacts as digoxin immunologically in RIA and HPLC testing, giving falsely high autopsy digoxin readings. This led to serial murder charges (1980-81) related to cardiac-ward deaths at the Toronto Hospital for Sick Children. Peter Macklem, Professor of Medicine at McGill, and an expert in blood chemistry, wrote the Foreword. Macklem stood almost alone during the 2-year-long Grange Royal Commission of Inquiry into the baby deaths (1984), in defense of Susan Nelles, resulting in her acquittal. A less fortunate Netherlands nurse, Lucia de Berk, was convicted of murder on similar falsely high autopsy digoxin readings, suffered a stroke when the verdict was announced and served 6 years of a life sentence before being released. A review of the book by the WHO International Drug Monitoring Centre in Sweden states that this "important book reveals the systemic failure of government health protection agencies to protect citizens from a known allergenic and toxic chemical, MBT, a worldwide contaminant of injections for 30 years" (Uppsala Reports, April 2013).

This letter corrects incorrect, but significant, information included in the Davenport et al. response to my letter: **Re: Latex content in adult vaccines, Dec. 2019, Davenport et al.**, which addressed a continuing, but correctable, potentially lethal injection hazard that affects the military, and the world population.

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MBT, known to be hepatotoxic, may have contributed to the severe liver damage reported in neonatal babies on prolonged IV feeding. The large caliber (100 mL) disposable syringes in infusion pumps had greater plunger-seal diameters than neonatal thighs.

Disposable syringe MBT rubber caused amniotic-fluid-culture cell deaths worldwide (Garver, NEJ 1976). Syringe manufacturer, Terumo, collaborating with Japanese health authorities, created a safe synthetic rubber. Japanese pharmaceutical rubber became MBT free by 1985. Sanofi-Pasteur pertussis vaccine, the first foreign-made vaccine imported into Japan, used MBT rubber, resulted in four child deaths (2011). Consider that the four child deaths from injections of only one specific vaccine, one age group and in one country, gives insight into the risk of natural rubber contact in many injectable drugs for all age groups, worldwide, for many years, a public health threat long demanding correction.

Manufacturers chose Japan for a major study on the incidence of severe reactions in patients receiving intravenous pyelogram (IVP) injections of radiopaque contrast agents ("X-ray dyes") (Katayama, Radiology 1990) to show the urinary tract components on radiographs. The study revealed that there was a significant reduction in severe reactions with a new "non-ionic" dye compared to the older "ionic" class of contrast agents. At significant cost to global health care—year after year since then—there was a widespread shift to nonionics for IVPs and for angiography, a pattern persisting today despite there being no safety difference.

In the thousands of IVPs, I personally injected in the radiological investigation of the urinary tract, anaphylactic shock occurred in one patient in each of two clusters of milder allergic reactions to the injections. There was always latex exposure, but it was only when MBT contamination was proven—from the natural rubber seals in disposable syringes (1983), and from natural rubber ampoule seals (1987)—that clusters of allergic reactions occurred. After the 1983 cluster, I eliminated syringe natural rubber by using Danish all-plastic Pharmaplast syringes and then Terumo Japanese syringes that employed a new non-MBT synthetic rubber for disposable syringe plunger tips. Despite these precautions a second cluster of reactions, including anaphylaxis, occurred, this time from MBT leaching from rubber ampoule seals.

“Potentially toxic” blood levels of MBT were found in 91 premature neonatal babies in London, England, (1985) by Hammersmith Hospital scientists. An unusual (but chemically correct) designation for the contaminant, benzothiazole-thiolate, disguised its MBT nature until several years later when I recognized that MBT and benzothiazole-thiolate had identical chemical formulae. If these infants had been tested for digoxin, falsely high (toxic) digoxin readings would have been registered by RIA and HPLC testing.

A 1994 paper by Michael Betman at the national meeting of the Radiological Society of North America in 1994, lauded the increased safety of the new non-ionic contrast agents. Prof. Stuart Houston, past 6-year editor of the *CARJ*, rose from the floor to state that the Royal University Hospital (Saskatoon) continued to use ionic dyes, because his group knew of the MBT hazard, which was no longer a problem, in Canada, stating that in the past two years “We have not had a serious IV contrast reaction. Formerly, we had deaths and serious reactions in batches (attached personal communication). (Note that Japan, the country selected for the Katayama study, was unique in the world, because all dye injections had no contact with MBT rubber.) Elliott Lasser, a radiologist and world authority on contrast media reactions, using 2 years of FDA statistics, confirmed the Saskatoon experience, noting (*Radiology* 1994) that after 1990, the inexpensive nonionics and

the ionics had a similar incidence of serious reactions (but one more death occurred with the expensive nonionics).

During a 1957 internal medicine residency, I learned that anaphylaxis can follow any injection, even IV saline. I can remember now that IV saline administration required inverted glass bottles with natural rubber stoppers.

The hazard of MBT contamination of injections affecting the military, their families, and all Americans is not confined to adult vaccines, but exists with all injectable pharmaceuticals using natural rubber in syringes, ampoules, and unit-dose packaging.

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CONFLICT OF INTEREST STATEMENT

None declared.

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