

**Table 1**

Examples of Counterfeit Drug Issues Threatening Health and Safety Worldwide That Are Potentially Preventable with Radio-Frequency Identification (RFID) and Widespread Implementation of e-Pedigree Technology

Drug Name	Issue
Procrit (epoetin alpha) <sup>90</sup>	Procrit is a drug used in to treat anemia in HIV, kidney failure, and cancer treatments. Counterfeit product that made it into the US market was actually bacteria-contaminated water or diluted product.
Cardiovascular medications like heparin <sup>90,91</sup>	Heparin is an anticoagulant also known as a “blood thinner.” Product was contaminated with oversulfated chondroitin sulfate somewhere in the supply chain in China. Responsible for 152 adverse events in 113 patients in 13 states.
Biaxin (clarithromycin) and other antibiotics <sup>90,91</sup>	Product with no active ingredients (placebos) made its way into the US supply chain. These products could make patients sicker by not treating an infection. Products may also be tainted by heavy metals or other dangerous ingredients.
Lipitor (atorvastatin) <sup>90</sup>	Large quantity of counterfeit product made its way into the US pharmaceutical supply chain, resulting in a large recall with more than 200,000 units recalled.
Zerit (stavudine) <sup>90,91</sup>	HIV medication that had counterfeit and misbranded products (e.g., 40 mg labeled as 30 mg) made its way into the US market. Problems with HIV drugs subject patients to dangers such as lack of treatment and exposure to toxic compounds.
Multiple drugs in Africa including drugs to treat HIV, cardiovascular drugs, and drugs used to treat tuberculosis <sup>91,92</sup>	WHO reports that many counterfeit items have been used in Africa, and some nations may have up to 40 percent of their drug supply consisting of counterfeits.
Cialis (tadalafil), Viagra (sildenafil), Levitra (vardenafil) <sup>91,93</sup>	Counterfeit versions of erectile dysfunction drugs have been found in the mail on the way to US consumers. Products have been noted to contain any number of hidden poisons such as road paint, antifreeze, or an undeclared and unapproved medication such as Sibutramine.
Botox (Onabotulinumtoxin A) <sup>94,96</sup>	Product used for cosmetic purposes and to treat migraines. With one batch, four victims were hospitalized with severe botulism poisoning. The paralysis was temporary as a result of being injected with potent, unapproved botulinum toxin.
Antineoplastic drugs <sup>91,95</sup>	Fake cancer drugs have been found in Israel, China, and the United States. Multiple products were affected, including Avastin vials containing no real drug.

Abbreviations: HIV, human immunodeficiency virus; WHO, World Health Organization.