Don't Have a Meltdown Over 'Dirty Nukes'

By ACSH Staff — June 11, 2002

Yesterday's news that an American citizen had been charged with plotting with al Qaeda to obtain a "dirty nuke" is understandably causing increased anxiety in our already skittish nation. Before we start handing out radiation pills to everyone, however, we need to take a careful look at the real risks we face, and how to counter them.

Apparently, Jose Padilla (a.k.a. Abdullah al Mujahir) was plotting to detonate a radiological dispersion device. Such a device uses conventional explosives, such as dynamite, to scatter radioactive material. Unlike a nuclear bomb, which uses highly enriched uranium and plutonium -- substances that are very hard to obtain -- a dirty bomb might use more available radioactive material, such as cesium-137 or cobalt-60, which could be stolen from a hospital.

If such a device were detonated, it could cause substantial damage in the immediate area. As with any conventional explosive, the degree of damage would depend on the size of the device and the concentration of the population. Some contend that such a device could render an entire urban area uninhabitable by spewing radiation far and wide. In fact, the radiation release would likely be minimal; it would not result in the type of "plume" associated with a Chernobyl-style nuclear accident, or the explosion of a nuclear bomb. According to Andrew Karam, a radiation safety officer at the University of Rochester, a dirty bomb "would probably not lead to many, if any, cancer deaths." The worst impact would probably be from panic, which could lead to traffic accidents and heart attacks; it might even deter emergency workers from assisting victims of the explosion. There would also be a big economic impact from shutting down and evacuating a target area such as Wall Street.

What about the possibility of a radioactive release from an assault on a nuclear power plant? All evidence indicates that our nuclear power facilities are virtual fortresses, impervious to most forms of terrorism. According to Richard Meserve, chairman of the U.S. Nuclear Regulatory Commission, "Nuclear power plants have an inherent capability to protect public health and safety through such features as robust containment buildings, redundant safety systems and highly-trained operators. These plants are among the most hardened structures in the country. . . . It is not expected that the impact of (even) a small plane into a site structure would result in a serious threat to public health."

Of course we need to remain on guard, and preemption of possible attacks, such as the arrest announced yesterday, remains our best defense. Improvements in detection of radioactive materials, which might be smuggled into cities aboard trucks or ships, would also be highly desirable. But what about nuke-proofing ourselves with medication?

There is no such thing as a pill which can fully protect the human body from excessive exposure to radiation. Intense exposure causes immediate tissue damage and results in death. Lower doses
can cause increased risk of cancers, including, as we learned from Hiroshima and Nagasaki, leukemia. The most effective means of reducing risks is evacuation, shelter and protection of the food supply.

Potassium iodide pills (also known as KI pills) have recently made headlines, earning an undeserved reputation as "nuclear protection medication." Indeed, the Nuclear Regulatory Commission is making these pills available to states with nuclear reactors. Officials in Vermont, Maryland and Westchester County, New York, are among those who have already begun distribution to citizens. No doubt city-dwellers will now be demanding their own KI supply from the government.

How do these pills work? It is well known that the thyroid gland is especially vulnerable to the delayed effects of radioactive iodine in fallout. Exposed infants and children are particularly at risk. Even very small amounts of inhaled or ingested radioiodine can do serious damage as it is concentrated in the thyroid gland, increasing the risk of thyroid cancer.

There is sound scientific evidence that taking KI just before or immediately after radiation exposure will saturate a person's thyroid gland with safe, stable iodine and "fill it up" so that there is no room for the radioactive iodine to settle in. But this is the only protective effect of KI. It will not protect from other effects of radiation -- and it will not protect from the radiation of a "dirty bomb" unless the device actually contains radioactive iodine.

Moreover, KI would be effective only if administered within a few hours of exposure. In 1979, when there was fear of dangerous radiation exposure (which never did occur) at Three Mile Island, stockpiles of KI took more than 24 hours to reach the targeted population which, fortunately, did not need it. Given such a long lag time, it makes little sense for the government to stockpile the pills today.

Stockpiling or distributing the pills would only unnecessarily heighten anxiety about what remains, despite yesterday's news, a hypothetical risk. A government imprimatur on KI would convey false assurances, might lead to abuse of the pills (which could suppress normal thyroid activity), and diminish the priority that should be given to efforts aimed at evacuation, shelter and monitoring food supply.

On the other hand, given the drug's low cost, relative safety (if not misused), and proven efficacy, Americans should continue to have access to KI, which is available at your local pharmacy (or the Internet) without a prescription. For some, having the drug in their medicine cabinets might offer relief from an otherwise overwhelming sense of powerlessness in the face of potential disaster, much in the same way having Cipro on hand may have eased fears during the anthrax crisis last fall.

But the prospect of even a "dirty nuke" in al Qaeda hands is no reason to panic. If the terrorists get their hands on a real nuclear device, such as might be found in the Russian or Pakistani arsenals, then it's a different story.