

Report on HPA conference
Polonium-210: The public health response
27 March 2007, London

Polonium-210: The Public Health Response

This meeting was extremely well attended with upwards of 400 delegates including 77 from overseas. The slides shown to illustrate the lectures can now be seen on a web-site <http://www.hpa-events.org.uk/Polonium>.

The meeting was addressed by, among others, a government minister (Patricia Hewitt) and 8 senior administrators from the HPA all of whom extolled the efficiency and skill with which the HPA dealt with the incident. Only 2 HPA employees from the old NRPB at Chilton produced the science in the form of methods of surface monitoring and assessment of internal radiation doses and risk.

Clearly the incident, which apparently rated 4 (out of 5) on the Cabinet Office (COBR) scale, was handled effectively by the HPA and Westminster City Council with minimum public alarm. However a number of speakers pointed out that a terrorist "dirty bomb" would present a different set of problems and could not be so easily dealt with.

Monitoring of the members of the public and others who were potentially contaminated was obviously a mammoth task. Quite early on after the exposure to Po-210 was recognised it was agreed that, although the proportion of any Po-210 intake which is excreted in the faeces is about twice that in urine, it would be preferable to monitor urine. Overall 741, 24-hour urine samples were tested. Natural levels of Po-210 in the environment produce about 24 mBq/day in the urine so a minimum reporting level of 30 mBq/day was established – about 81% of the samples were below this level. Additional bands of dose were; up to 1 mSv, 1-6 mSv, and >6mSv – only 17 people have predicted doses over 6 mSv. The upper dose reporting band was predicated on this being the action level (3/10 of the dose limit) for workers. Several of the people, who had a significant intake, will be monitored over an extended period to provide more information on the biological turnover of polonium (half time of elimination is about 50 days).

The actual information on Mr Litvinenko was a little less detailed. Mike Bailey from HPA-RPD suggested he may have ingested about 1 GBq (= 6µg) of Po-210 which would have resulted in a dose of about 9 Gy to his bone marrow in 3 weeks (equivalent to about "250 Sv" [sic]). However, this was extrapolated from a rat LD_{50/30} experiment in which 100 MBq of Po-210 was injected – the chemical form of the polonium ingested by Mr Litvinenko may well have differed from the animal experiment and

possibly had a significant effect on his uptake. Nevertheless some interesting factors were given from the literature on the likely systemic model for polonium which illustrated its soft tissue distribution in contrast to other alpha emitters e.g. 10% absorption from the gut, 30% from blood into liver, 10% into kidneys, 5% into the spleen and 10% into bone marrow. Presumably as a result of the ongoing police investigation no could be given of the "crime" and particularly how it was perpetrated and also no details were presented of the progression of the victim's medical condition or the treatment given.

Amongst other information given the NHS Direct call centre's experiences (3791 calls dealt with) were of interest and the international dimension turned out to be quite important – a number of foreign nationals were potentially exposed at two hotels and on 4 planes; reassurance was given to 673 people.

It was made plain that this incident had stretched the HPA and they had coped, just. Additional help had been called in from the Veterinary Lab at Weybridge and CEFAS at Lowestoft to assist with urine analysis when the HPA-RPD's capacity (40 samples per day) was exceeded. Several speakers hoped that there might be cooperation throughout the EU in future incidents.

The cost (£2m) of incident management and monitoring was picked up by the DoH but the cost of decontamination in 16 buildings in London will, apparently, have to be met by their owners.

Overall this meeting did emphasise the effectiveness of the HPA's emergency plans and lived up to its title.

Barrie Lambert