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### Stable Iodine Prophylaxis

#### Recommendations of the 2nd UK Working Group on Stable Iodine Prophylaxis

This report from the Working Group reflects understanding and evaluation of the current scientific evidence as presented and referenced in the full document.

The [Executive Summary](#) of the document and the membership of the [Working Group](#) are given below.



[The full document](#) (PDF, 137 kB, 34 pages)

#### EXECUTIVE SUMMARY

##### TERMS OF REFERENCE

- 1 In 1989 a UK Working Group on Stable Iodine Prophylaxis was convened by the Department of Health (DH) to provide advice on all aspects of the use of stable iodine as a protective measure following an accidental release of radioiodine. The recommendations of this Group were published in 1991 (UK Working Group, 1991). In developing its advice, the Group reviewed guidance published by the World Health Organisation (WHO, 1989). In late 1999, WHO updated its guidance in the light of additional information gained from the incidence of thyroid cancer in children following the accident at the Chernobyl nuclear power plant in April 1986 (WHO, 1999). The National Radiological Protection Board (NRPB), at the request of DH, convened a 2nd UK Working Group to review the latest WHO guidance in the context of emergency planning for nuclear accidents in the UK. This Working Group was also asked to review the Patient Information Leaflet currently supplied with stable iodine tablets in the UK, as questions had been raised whether it was written in a style appropriate to its target audience.
- 2 The terms of reference of the 2nd UK Working Group on Stable Iodine Prophylaxis were:
  - a. to consider whether, in the light of both the

- a. to consider whether, in the light of both the new WHO guidance and the experience gained after the Chernobyl reactor accident, revisions are required to the advice published by the 1st Working Group in 1991,
- b. to consider whether the NRPB Emergency Reference Levels (ERLs) for stable iodine prophylaxis require amendment,
- c. to look at the leaflet that accompanies the stable iodine tablets and, if appropriate, suggest revisions to the text.

### **ACTIVITIES OF THE 2ND WORKING GROUP**

- 3 The Working Group met three times during 2000, and completed its report by correspondence in 2001. The membership of the Working Group is given below.
- 4 The Working Group reviewed the revised WHO guidance and the information published since 1991 on the risks of thyroid cancer in children from radioiodine and the risks of side effects from stable iodine. In particular, it reviewed data compiled on the incidence of thyroid cancers in children following the accident at the Chernobyl nuclear power plant in 1986. It considered whether the NRPB ERLs were still appropriate, in the light of the new data. It also reviewed a range of other recommendations given by the 1st Working Group, concerning the chemical form of stable iodine tablets and practical issues concerning implementation of stable iodine prophylaxis. Finally, it reviewed the Patient Information Leaflet that is required, by law, to be included in each box of tablets and provided suggestions for information to be included in a separate information leaflet to be handed out to the public when stable iodine tablets are distributed.

### **SUMMARY OF MAIN RECOMMENDATIONS AND CONCLUSIONS**

- 5 The Working Group's main concern is to highlight the potential vulnerability of young children following an accidental release of radioiodine. Inhaled and ingested radioiodine is preferentially taken up by the thyroid and, compared with adolescents and adults, young children's thyroids are more radiosensitive. Also, such children are likely to consume greater quantities of milk, a food which can become contaminated within a few days of an atmospheric release of radioiodine. The Working Group's main recommendation is therefore that the prime focus of emergency planning against releases of radioiodine should be the protection of newborn babies (neonates), children under ten years, and pregnant and nursing women. Stable iodine prophylaxis has the potential to provide total protection from intakes of radioisotopes of iodine. Generally, the Working Group expects stable iodine prophylaxis to be planned for protection against inhaled radioiodine only. Protection against ingestion of radioiodine in foods is better achieved using food restrictions, and UK

better achieved using food restrictions, and UK emergency plans envisage this. However, the Working Group advises that if, in unforeseen circumstances, the planned food restrictions cannot be implemented promptly, then stable iodine prophylaxis should be used as a temporary measure to provide protection for young children against the ingestion exposure pathway, until the food restrictions can be imposed.

- 6 The Working Group's wider recommendations are summarised below.

**ERLs for stable iodine prophylaxis**

- 7 With respect to the ERLs for stable iodine prophylaxis, the Working Group makes the following recommendations for consideration by NRPB.
- a. The priority for emergency planning for stable iodine prophylaxis should be the protection of neonates, children aged under ten years, and pregnant and nursing women.
  - b. Detailed emergency plans should provide for the stable iodine tablets to be administered promptly, as the health benefit afforded reduces with increased delay in administration.
  - c. It is not necessary to move to a system of age-related ERLs in the UK, provided that the lower ERL adopted is appropriate for children aged under ten years and neonates, and that the relevant planning emphasises the priority in administration to be afforded to these age groups.
  - d. The combination of sheltering (or evacuation) with stable iodine prophylaxis within UK emergency planning forms an important element in the provision of overall protection and, therefore, the existing link between the ERLs for sheltering and stable iodine prophylaxis should be retained.
  - e. Following a reactor accident, the ingestion of contaminated milk is potentially the greatest thyroid exposure pathway: provided appropriate food restrictions are put in place promptly to protect children against this exposure pathway, then it is appropriate for the ERLs for stable iodine prophylaxis to be compared with expected doses from inhalation only; otherwise it is the sum of the expected doses from inhalation and ingestion that should be compared with the ERLs.
  - f. Consideration should be given to reducing the upper ERL for stable iodine prophylaxis to 100 mGy averted thyroid dose from inhalation: this would retain flexibility for planning and response for the administration of stable iodine to adults, but signals the fact that stable iodine prophylaxis has now been demonstrated to have minimal side effects.
  - g. The administration of stable iodine tablets to

- g. The administration of stable iodine tablets to children aged under ten years and neonates should generally be planned at the level of the lower ERL. The Working Group considers that the upper ERL is too high for adequate protection of these age groups.
- h. The lifetime risk to a child, exposed to 30 mGy thyroid dose (the currently recommended lower ERL), of developing thyroid cancer is in the range 1 : 1000 to 1 : 10,000.
- i. A reduction of the lower ERL to the WHO recommended value of 10 mGy would undoubtedly provide additional protection to children who would currently not receive prophylaxis. However, in determining whether to reduce the lower ERL, this benefit would need to be weighed against the detrimental consequences of changing existing emergency plans – for example, a possible delay in protection for those most at risk resulting from administration of stable iodine tablets to a larger population.
- j. NRPB should continue to review the risk estimates given here for internal exposure of the thyroid to radioiodine, in the light of future data on the incidence of thyroid cancer in those exposed in Belarus, neighbouring parts of Russia and northern Ukraine.
- k. The provision of appropriate information and support for those not receiving stable iodine prophylaxis should be considered as part of emergency planning.

The Working Group invites NRPB to review its advice on ERLs for stable iodine prophylaxis on the basis of these points, as elaborated in the main text of its report.

#### **Iodine tablets**

- 8 The Working Group recommends that the age-related dosages of iodine and the tablet sizes recommended by the 1st Working Group are still appropriate for use in the UK. These are set out in the table below.

#### **Recommended dosages for potassium iodate and potassium iodide**

<b>Age group</b>	<b>Equivalent mass of iodine (mg)</b>	<b>Potassium iodate (mg)</b>	<b>Potassium iodide (mg)*</b>
<b>Adults</b>	100	168.9	130
<b>Children aged 3–12 years</b>	50	84.4	65
<b>Children aged</b>	25	42.2	30–35

<b>aged 1 month- under 3 years</b>			
<b>Neonates (birth- under 1 month)</b>	12.5	21.1	15
*These values, taken from WHO (1989), are rounded.			

In addition, the Working Group advises the following.

- a. There are no medical grounds for preferring the iodate form over the iodide form.
- b. The pre-distribution of stable iodine tablets can be helpful in specific circumstances, but widespread pre-distribution to individual households is not advised.
- c. DH should review the future provision of adequate tablet stocks.
- d. All hospitals with maternity units, either in a detailed emergency planning zone around a nuclear site or serving the area of these zones, should stock iodine crystals for the preparation of accurate dosages of stable iodine for neonates in the first few days of life.
- e. There are no medical grounds for restricting the sale of stable iodine tablets to the public; however, emergency plans should not rely upon voluntary purchase.

### Information provision

- 9 The Working Group makes the following recommendations.

- a. The Patient Information Leaflet should be revised to specify that one quarter tablet be given to neonates.
- b. A separate, more 'user-friendly' leaflet should be prepared for distribution to the public at the time of an accident.
- c. The appropriate authorities should give consideration to the planned provision of relevant advice to other groups needing information on stable iodine after an accident, in particular to GPs.

### REFERENCES

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