Second Symposium on Ethics of Environmental Health (June 2014)

Need for consistency in dealing with individual sensitivity to workplace hazards

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• Aspiration rather than answers

• Conscious of expertise that is here
Growing interest in individual sensitivity to ionising radiations

• Clinical evidence – radiotherapy for breast cancer

• Growing radiobiological evidence
10s of Gy killing cells in the clinic

few in mSv at work

2005 ICRP

Genetic susceptibility to radiation induced cancer involving strongly expressed cancer is rare
UK Expert View

1. Known genetic radiation sensitivity
   • Testing could be done – some well known genes

2. Risk of cancer from radiation ‘to some extent’ relates to factors that apply to cancer in general
   • Potential of lifestyle factors in occupational risk

3. Risk of specific cancers could be much higher in certain sub groups

(Human radiosensitivity – UKHPA March 2013)
Must not be seen as an ionising radiation issue

But

An occupational or environmental health issue
1. Genetic Sensitivity

• Multiple genetic links with sunlight and skin cancer

• Lots of others, eg:
  – Specific genotypes and lung function following exposure to vapours, dusts and fumes

(A J Mehta et al, OEM, Vol 71, issue 4, 234-240 April 2014)
# Examples of Occupational Exposures Influenced by Genetic Factors

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Genetic Factor</th>
<th>Disease</th>
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</thead>
<tbody>
<tr>
<td>Beryllium</td>
<td>HLA-DPBI</td>
<td>Chronic Beryllium Disease</td>
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<tr>
<td>Organophosphate</td>
<td>PONI</td>
<td>Acute toxicity</td>
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<td>Pesticides</td>
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<td>Silicosos</td>
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<td>Silica</td>
<td>TNF</td>
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<td>Aromatic amines</td>
<td>NATZ, GSTM1</td>
<td>Bladder cancer</td>
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</tbody>
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2. Lifestyle

- Link between radon and smoking in relation to lung cancer
- Mirrors established multiplicative risk between smoking and asbestos
3. Risks to sub groups

- Type 1 anaphylaxis to latex
  Almost exclusively in the strongly atopic

?Ethics of elimination of latex
What do we do?

‘Traditionally – we strive to protect the most susceptible as a matter of principle – this should not be abandoned’

(Nelson and Kelsey OEM, Vol 71, issue 4, 229-230, April 2014)
Do we?
Should we?

UK Code of Practice on Noise 1984

In establishing a 90 dB(A) limit indicated ‘such a sound level ensures 80% of the population would suffer a hearing loss of no more than 20 dB after 50 years of exposure’. 
Experience to Date

ILO – genetic screening of workers should be prohibited, or at least limited to cases explicitly authorised by national legislation (ILO Code of Practice 1997)

Teratogens – conflict between sex discrimination and fetal protection
Individual Sensitivity

Is real
Not ionising radiation specific

Need a set of ethical standards for occupational health as a whole and if possible environmental health too