Introduction to the Risk Assessment for radiofrequency radiation exposures in pre-schools, schools, colleges, universities and places of care and residential accommodation for children and young people

The Risk Assessment itself can be found at: https://www.wirelessriskassessment.org/risk-assessment1

Introduction

The Management of Health and Safety at Work Regulations 1999[1] (Northern Ireland, 2000[2]) and the Health and Safety at Work Act 1974[3] (Health and Safety at Work Northern Ireland Order 1978[4]) require that all employers make "a suitable and sufficient" assessment of the risks to health and safety of employees and non-employees who may be affected by the employer's undertaking. Employers have to provide a work environment that is, as is reasonably practicable, safe and without risks to health; non-employees are not to be exposed to risks to their health and safety.

Risk assessments are also required in order to protect women of child-bearing age, new and expectant mothers, or the developing baby, from processes, working conditions, physical, chemical or biological agents.

In addition, employers have common law obligations, including a duty of care[5]. They have a moral and ethical duty not to cause, or fail to prevent, physical or psychological injury. An employer's duty of care for their employees means that they should take all steps which are reasonably possible to protect the health, safety and wellbeing of their employees and those within their care. Head Teachers/Principals also have a common law duty of care '*in loco parentis*' for their pupils (Latin for 'in the place of a parent'). This duty of care requires a Head Teacher to do all that is reasonably possible to protect the health, safety and welfare of the pupils within their school[6].

Microwave, radiofrequency radiation (300 MHz – 300 GHz) and radiofrequency radiation (30 kHz – 300 GHz) are frequently used for wireless communication technologies; new devices, applications and innovations are constantly being developed. Examples of technologies which emit radiofrequency signals are tablet computers, 'smart' phones, cordless phones, Wi-Fi access points, wireless printers, wireless virtual reality headsets, 'smart' meters, internet-enabled watches and Bluetooth, etc.

Evidence for harmful effects of radiofrequency signals is well documented in the scientific literature[7,8,9,10]. Whilst not all studies have demonstrated adverse effects, there are enough studies which have demonstrated harmful biological effects for there to be serious concerns

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[1] The Management of Health and Safety at Work Regulations 1999, http://www.legislation.gov.uk/uksi/1999/3242/contents/made

[2] The Management of Health and Safety at Work Regulations Northern Ireland, 2000, http://www.legislation.gov.uk/nisr/2000/388/contents/made

[3] Health and Safety at Work etc. Act 1974, https://www.legislation.gov.uk/ukpga/1974/37

[4] Health and Safety at Work (Northern Ireland) Order 1978, http://www.legislation.gov.uk/nisi/1978/1039

[5] 'Defining an employer's duty of care', accessed 22 May 2018 from Acas (Advisory, Conciliation and Arbitration Service) website, http://www.acas.org.uk/index.aspx?articleid=3751

[6] 'NUT Notes 2012-2013: Education, the law and you', National Union of Teachers (page 3), accessed 22 May 2018 from https://www.teachers.org.uk/files/the-law-and-you--8251-.pdf

[7] UK Parliamentary Science and Technology Committee Early Years Interventions Inquiry 2017, https://cdn.website-editor.net/2479f24c54de4c7598d60987e3d81157/files/uploaded/Early_Years_Inquiry_EY10062.pdf

[8] Starkey 2016, Rev Environ Health 31(4):493-503, https://www.degruyter.com/downloadpdf/j/reveh.2016.31.issue-4/reveh-2016-0060/reveh-2016-0060.pdf

[9] EMF Portal, https://www.emf-portal.org/en

[10] PubMed, https://www.ncbi.nlm.nih.gov/pubmed/

about risks to health or development[11]. Babies, children and young people are considered at particular risk because they are still developing, can absorb the signals more easily into their bodies, have increased cell division and will have a higher lifetime of exposure[12,13].

The World Health Organization's (WHO) International Agency for Research on Cancer (IARC) classified radiofrequency radiation as a Group 2B 'Possible Human Carcinogen' in May 2011[14] and more recent published evidence has strengthened the association [e.g. 15,16,17,18,19,20,21,22,23]. The IARC Monograph 102, describing the radiofrequency radiation carcinogen classification, includes that radiofrequency exposures in children can be greater than in adults (pages 71 and 74[14]). The classification includes all radiofrequency radiation, including from Wi-Fi access points, tablet computers, mobile phones, cordless phones, 'smart' meters etc.[14].

Actions to remove hazards, introduce restrictions and put in place safeguarding policies are necessary for radiofrequency signals in order to protect children, young people, women of child bearing age, pregnant women and their unborn children, those with existing medical conditions, as well as creating a safe workplace for all employees and visitors.

An example Risk Assessment, with suggestions for wireless technologies commonly used in schools, is provided at https://www.wirelessriskassessment.org/risk-assessment1.

General information on Risk Assessment

Risk assessment is a structured method of:

- identifying hazards (a hazard is something with the potential for harm e.g. chemicals, electricity, radiation, working on a ladder, or in an area where there is potential for violence).
- evaluating the risk (the risk is the chance or probability, great or small, of that harm occurring).

Once the level of risk has been identified then the following principles of risk prevention or reduction should be applied, according to the following order of priority:

- eliminate the hazard completely (this will then remove the risk entirely)
- reduce the level of risk by substituting the hazard with a less harmful substance or article
- prevent access to the risk (by use of guards, barriers, remote operation etc.)
- control the amount of exposure to acceptable levels by:

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[11] EMF Scientist Appeal, www.emfscientist.org; https://vimeo.com/123468632
[12] IARC Monograph 102, 2013, http://monographs.iarc.fr/ENG/Monographs/vol102/index.php
[13] Morgan et al 2014, Journal of Microscopy and Ultrastructure 2(4):197-204, https://www.sciencedirect.com/science/article/pii/S2213879X14000583
[14] IARC Monograph 102, 2013, http://monographs.iarc.fr/ENG/Monographs/vol102/index.php; Press Release, http://www.iarc.fr/en/media-centre/pr/2011/pdfs/pr208_E.pdf; Lancet Oncology article, http://www.thelancet.com/journals/lanonc/article/PIIS1470-2045(11)70147-4/fulltext?_eventId=login
[15] Coureau et al 2014, Occup Environ Med 71:514-522, http://www.ncbi.nlm.nih.gov/pubmed/24816517
[16] Hardell et al 2013, Int J Oncol 43:1036-1044, http://www.ncbi.nlm.nih.gov/pubmed/23877578
[17] Hardell et al 2013b, Int J Oncol 43:1833-1845, http://www.ncbi.nlm.nih.gov/pubmed/24064953
[18] Morgan et al 2015, Int J Oncol 46(5):1865-1871, http://www.ncbi.nlm.nih.gov/pubmed/25738972
[19] Hardell and Carlberg, 2013, Rev Environ Health 28:97-106, http://www.ncbi.nlm.nih.gov/pubmed/24192496
[20] Söderqvist et al 2011, Environ Health 10:106, http://www.ehjournal.net/content/10/1/106
[21] Hardell and Carlberg 2015, Pathophysiology 22:1-13, http://www.ncbi.nlm.nih.gov/pubmed/25466607
[22] US National Toxicology Program 2018, https://ntp.niehs.nih.gov/results/areas/cellphones/index.html; https://ntp.niehs.nih.gov/about/org/sep/trpanel/meetings/past/index.html
[23] Ralcioni et al 2018, Environ Res 165:496-503, https://www.ncbi.nlm.nih.gov/pubmed/29530389

i. engineering design (e.g. shock absorbers on noisy equipment to reduce the noise level)
ii. job design (safe systems of work, permits to work, supported by suitable information, instruction, training and supervision)

- issue personal protective equipment (gloves, boots, hard hats etc.) only as a last resort where other parts of the strategy cannot be used
- provide welfare facilities (e.g. washing facilities for removal of contamination and first aid facilities)
- where appropriate use safety signs to assist in informing people of the hazards.

Managers, including Head Teachers/Principals are responsible for:

- Ensuring that any task or activity which could affect the health and safety of their employees or anyone else (clients, visitors, pupils etc.) has been subject to risk assessment.
- Ensuring that their employees are aware of any risk assessment related to their work and are provided with any specific training or equipment required.
- Reviewing the job risk assessment at appraisal or as appropriate e.g. if the nature of the job changes or the person experiences any health problems or adverse effects which could affect their ability to carry out the job safely.
- Ensuring, where necessary, that in addition to the job risk assessment any other written safe systems of work are prepared and brought to the attention of all relevant employees.
- Ensuring that any new activities/jobs are risk assessed before they take place for the first time.

A Board of Governors are responsible for:

- Ensuring that the Head Teacher and Management Team develop a safety management system throughout the school.
- Monitoring the effectiveness of the school's health and safety arrangements.
- Developing and implementing arrangements to ensure that all school risk assessments are completed and implemented and equipment and materials purchased by the school are safe and suitable for their intended use.

Potential hazard - *item, substance or activity with the potential to cause harm.*
A single hazardous activity can have many potential elements of harm, and it is important that those completing the risk assessment identify this, e.g. working with electricity (hazard) anticipated harm would be fire, explosion, electrocution and burns.

Control Measures (in order of priority) – eliminate hazard, substitute with less hazardous alternative, prevent access to the hazard, control the amount of exposure, training, written instructions, personal protective equipment, welfare facilities, safety signs.