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## Title (required)

Occupational exposure to electromagnetic fields: workers at particular risk and indications for health surveillance

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## Summary (required)

### Introduction

Occupational exposure to electromagnetic fields (EMF) is almost ubiquitous nowadays in industrialized countries. Specific work-related risks may involve the exposed workers and accordingly an adequate health surveillance (HS) program is required, especially for the so-called "workers at particular risk".

### Methods

In EU, the HS of workers exposed to EMF is mandatory based on the Directive 2013/35/EU. Considering the available indications and a survey among Occupational Physicians (OPs), we identified the main criteria to be considered for an appropriate HS, as well as for the identifications of the "workers at particular risk" for EMF exposure, as defined by the Directive.

### Results

The EU Directive specifically addresses the prevention of direct biophysical effects, excluding long-term effects as scientific evidence of a causal relationship is considered inadequate, and indirect effects of EMF exposure. These latter effects include interference and the risk can be relevant in case of presence of workers with Active Implanted Medical Devices (AIMD) and/or with Active Wearable Medical Devices (AWMD), even in conditions of exposure levels below the recognized limits to protect the general public. Accordingly, the medical examinations within the HS program should carefully look for the presence of AIMD and AWMD: the most frequent devices resulted the cardiac pacemakers and implantable cardioverter defibrillators for AIMD, while drugs/hormones infusion pumps and hearing aids for AWMD.

### Conclusions

Particular risks as the conditions of workers with AIMD or AWMD have to be carefully considered and assessed for the HS programs of subjects with occupational EMF exposure.

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