

Medical prophylaxis for Swiss nuclear workers

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There are always two means of preventing occupational disease. Firstly, the technical measures which must ensure that the risks at the workplace be as low as is reasonably achievable. Secondly, the medical measures, in this case prophylaxis, which have to maintain the employee's fitness for work with regard to the remaining risks (or exposures). Within the area of medical prophylaxis we may again differentiate between two objectives. First, to look for any pre-existing disease which could be dangerously aggravated under the impact of exposures to chemical or physical risks at the workplace. Secondly, to detect beginning occupational disease in as early a state as possible in order to take appropriate countermeasures. We talk here of "sélection" and "dépistage" (screening) respectively.

The Division of Occupational Medicine of the Swiss National Accident Insurance Fund (SUVA, Schweizerische Unfallversicherungsanstalt) is legally responsible for the whole of medical prophylaxis for all workers within Switzerland. Included is, of course, the medical radiation prophylaxis program.

From a scientific viewpoint, the value of medical prophylaxis may be questionable. First of all, physical dosimetry by dosimeters or by urinalysis and body scans for radionuclides can detect doses far below those exposures which could produce tissue damage and so would warrant medical diagnostic procedures. Secondly, there are not many pre-existing diseases which really make a worker unfit for work in places with radiation equipment. Often the exposure to radiation from medical diagnostic procedures exceeds the expected occupational exposures. Psychologically, the medical examination may have some value; it may offer a welcome opportunity to answer workers' questions on radiation and health. Scientifically it remains unsatisfactory, at least as long we do not have more sensitive means of biological dosimetry or a biological marker identifying radiosensitive individuals. Medical prophylaxis is prescribed by law in most industrialised countries, including Switzerland. At present, the medical examination of a Swiss nuclear worker is quite comprehensive. It follows a questionnaire established by SUVA (Form 1575) and consists of 3 parts:

- Personal history
- Physical examination
- Blood counts

In the *personal history* the worker is explored for pre-existing diseases, especially those involving organs and tissues known to be particularly sensitive to radiation, so as blood and skin, and organs which accumulate or eliminate nuclides (thyroid; liver, kidneys). Females are asked about possible pregnancy. Furthermore, medical radiation exposures have to be asked for (minor diagnostic exposures, e.g. an x-ray of the chest, are not taken into account). Any history of cytostatic or immunosuppressive treatment is also noted.

The *physical examination* has to include a special evaluation of the condition of the skin of the hands of all persons occupationally exposed to radiation. This requirement, and the inclusion of *blood counts*, are explainable only on a historical basis. At the beginning of this century and long afterwards there was often no better way of detecting radiation overexposure. (With the coming new legislation, the Division of Occupational Medicine of SUVA will have the opportunity to adjust the examination procedures to present-day scientific knowledge.)

The medical examination takes place at the start of employment and every year thereafter. Any medical practitioner may perform the examination, and send the findings to SUVA's Division of Occupational Medicine. Within SUVA, the responsible occupational physician will study the results and decide on the fitness of the examinee for work (to declare an employee unfit for radiation work, a considerable risk for his health must be involved). Results are stored until the workers have reached the age of 70. Workers are only examined as long as they stay exposed to radiation. Follow-up after the end of occupational exposure (leaving the job, retiring) is not performed. The medical radiation prophylaxis examinations have no insurance purposes and the results are not communicated to the employer.

It may be added that another type of examination is required for all Swiss nuclear workers who have to wear protective clothing and respiratory masks. This examination takes place before the start of employment and thereafter once every 4 years¹. It is not directly related to radiation exposure, it includes checking for possible cardiocirculatory and respiratory insufficiency, metabolic and neural disorders (e.g. diabetes or epilepsy) and deficiencies of visual and acoustic perception. There are many exclusions from work in protective clothing, due to the high prevalence of cardiocirculatory and relatively high prevalence of respiratory disease in our

population. There was no exclusion related to radiation work per se in 1989.

As to the planned IARC study on nuclear workers, it may be mentioned that the private address of the examinees is not noted on the examination form neither are data on possible confounders like smoking.

Summary

Medical prophylaxis for Swiss nuclear workers is prescribed by law, as for all other persons occupationally exposed to radiation. Medical examinations including questions about the personal history, a physical examination and blood counts take place on entering the job and each year thereafter. Follow-up after leaving the job is not done. With the coming new legislation, medical prophylaxis will be better adjusted to the latest requirements.

Résumé

La prévention médicale pour les travailleurs dans l'industrie nucléaire en Suisse

En Suisse, l'ordonnance concernant la protection contre les radiations (OPR) contient des dispositions obligatoires prescrivant des examens médicaux de prévention à exécuter chez les personnes exposées aux radiations ionisantes dans l'exercice de leur profession, y inclus les travailleurs dans l'industrie nucléaire. Ces examens médicaux doivent porter au moins sur la formule sanguine des globules rouges et blancs et sur l'état de la peau des mains. De plus, l'anamnèse doit établir si des irra-

dations ont eu lieu antérieurement. Pareil examen s'effectue lors de l'admission, puis annuellement. Par contre, aucun follow-up n'est prévu à partir de la retraite ou d'un changement d'emploi.

Zusammenfassung

Arbeitsmedizinische Vorsorge bei Arbeitern der Schweizer Kernindustrie

In der Schweizer Strahlenschutzverordnung (SSVO) sind arbeitsmedizinische Vorsorgeuntersuchungen für beruflich Strahlenexponierte und damit auch für die Arbeiter in der Kernkraftindustrie verbindlich vorgeschrieben. Nebst der körperlichen Untersuchung wird ein Blutbild gefordert; ausserdem soll in der Anamnese auf frühere Bestrahlungen eingegangen werden. Die Untersuchung erfolgt beim Stellenantritt und danach einmal jährlich. Follow-up nach Verlassen der Arbeitsstelle oder der Pensionierung ist nicht vorgesehen. Mit der in Vorbereitung befindlichen neuen Strahlenschutzverordnung werden auch die Vorsorgeuntersuchungen den heutigen Erfordernissen angepasst werden können.

Reference

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