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French Occupational Disease System: Examples of Diseases Caused by Hand–Arm Vibration †

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Abstract: In France on 25 October 1919, a law was created so that workers suffering from occupational diseases because of their work could receive specific compensation. Built on the notion of "presumption of origin", the occupational disease tables outline the conditions for recognition.

Keywords: occupational diseases; regulation; occupational diseases tables; procedure

1. Introduction

Occupational diseases, which have constantly been on the rise for over more than 20 years now, can have an impact on both a person's professional life and private life. In France, employers are responsible for their prevention, but all occupational safety and health practitioners can play a role in identifying and preventing them to keep workers affected by these diseases in employment.

2. Definition

The French notion of an occupational disease is, above all, a medico-legal concept, conferring the right to specific compensation, which is identical to that of occupational accidents. This includes: a waiver of co-payments for all care relating to the disease including functional rehabilitation; a higher sick pay than that which is paid to people with a non-occupational-related sickness; the possible payment of benefits or annuities depending on the health effects according to the permanent impairment rating evaluated by Social Security's medical advisor. In France, costs are borne by employers through occupational accident/occupational disease contributions paid to the occupational hazard branch of Social Security by companies under the general social security scheme (RG) and to the agricultural mutual fund by companies under the agricultural social security scheme (RA). For civil servants, the system is managed by each individual administration.

Self-employed French workers are not covered for occupational hazards unless they have taken out voluntary insurance under the general social security scheme.

3. The Presumption of Origin

In the French system, a disease is occupational if it is the direct consequence of a worker's exposure to a physical, chemical, or biological hazard or resulted from the conditions under which they perform their professional activity. However, it can be difficult to establish a direct causal link between work and a given disease. This is why, since the introduction of a law on 25 October 1919, a disease has been recognized as occupational if it appears in one of the tables in the French Social Security Code or to the Rural Code. For civil servants, the disease tables under the general scheme also apply.

These tables all follow the same model (Table 1):

- A **title** stating the **hazard** that is taken into account. This can be a chemical agent (for example "Occupational diseases following the inhalation of asbestos dust" RG 30 or

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RA 47), a biological agent (for example "Diseases due to tubercle bacilli and certain atypical mycobacteria" RG 40 or RA 16), a physical agent (for example "Diseases caused by ionizing radiation" RG 6 or RA 20), or a "work environment" (for example "Diseases caused by vibrations and shock transmitted by certain machine tools, tools and objects and repeatedly hammering objects with the palm heel" RG 69 or RA 29);

- A **left column** enumerating the **diseases or symptoms** recognized as possibly being linked to the hazard mentioned in the title (for example, for table RG 69: arthritis of the elbow, osteonecrosis of the lunate, or angioedema of the hands). Certain tables also mention the conditions of the diagnosis, such as those in table RG 42 "Hearing disorder caused by noise", or specific additional exams, such as functional tests for objective evidence of Raynaud's phenomenon for angioedema in part A of table RG 69;
- A **right column** presenting a **restrictive or indicative list of work** that involves exposure to the hazard and is likely to cause the disease or disorder mentioned in the left column. For table RG 69, this list is restrictive, i.e., only workers performing the work mentioned (work and tasks and not jobs) can have the benefit of the presumption of origin;
- Lastly, a **center column** stating the **time limit for compensation**, i.e., the maximum period between the end of exposure to the hazard (regardless of the reason for this end of exposure) and the first medical diagnosis. For some tables, there is also a **minimum period of exposure** to the hazard (as for part C of table RG 69).

Table 1. Example of an occupational disease table (RG 69). Diseases and disorders caused by vibration and shock transmitted by certain machine tools, tools, and objects and by repeatedly hammering objects with the palm heel. Date of creation: decree on 15 July 1980; the most recent update: decree on 6 November 1995 (Adapted from Ref. [1]).

Designation of Diseases and Disorders	Time Between End of Exposure and First Diagnosis	Restrictive List of Work Likely to Cause These Diseases and Disorders
- A -		
Osteoarticular diseases confirmed by radiology exams: -Arthritis of the elbow involving radiological signs of osteophytosis; - Osteonecrosis of the lunate (Kienböck disease); - Osteonecrosis of the carpal scaphoid (Köhler disease). Angioedema of the hand, predominately the index and middle fingers, which may be accompanied by cramps in the hand and prolonged impaired sensitivity and confirmed by functional tests for an objective diagnosis of Raynaud's disease.	5 years 1 year 1 year 1 year	Work regularly involving exposure to vibration transmitted by: (a) Hand-held machine tools, in particular: - Percussive tools, such as jack hammers, chipping hammers, bush hammers, and rammers; - Rotary–percussive machines, such as rock drills, hammer drills, and impact wrenches; - Rotary machines, such as polishers, grinders, sawing machines, and brush cutters; - Alternative machines, such as sanders and jigsaws. (b) Hand-held machines associated with certain abovementioned machines, particularly in chiseling work; (c) Workpieces held in the hand while being processed, particularly during grinding and polishing work and work on swaging machines.
- B -		
Osteoarticular diseases confirmed by radiological exams: -Arthritis of the elbow, involving radiological signs of osteophytosis; - Osteonecrosis of the lunate (Kienböck disease); - Osteonecrosis of the carpal scaphoid (Köhler disease).	5 years 1 year 1 year	Work regularly involving exposure to shocks caused by manual use of percussive tools: - Hammering work, such as smithing, sheet metal working, boiler making, and leather working; -Earth moving and demolition works; -Use of caulking guns;- Use of nail guns and riveting hammers.

Table 1. *Cont.*

Designation of Diseases and Disorders	Time Between End of Exposure and First Diagnosis	Restrictive List of Work Likely to Cause These Diseases and Disorders
- C -		
Hypothenar hammer syndrome (HHS) causing Raynaud's phenomenon or finger ischemia confirmed by arteriography, providing objective evidence of an aneurysm or thrombosis of the ulnar artery or the superficial palmar arch.	1 year (subject to an exposure period of 5 years)	Work regularly involving exposure to repeat hammering of objects with the palm heel or involving exposure to shock transmitted to the hypothenar eminence by a percussive tool or a tool receiving impact.

The presumption of origin enables a worker, covered by a French social security body, meeting the conditions of an occupational disease table, to not have to prove the link between their disease and their work; rather, it is up to the employer in France or the French social security body to demonstrate that there is no link between the disease and the professional activity.

The French occupational disease tables are drafted based on social consensus according to scientific expertise, within advisory commissions under the Labor and Agriculture ministries. They then become the subjects of simple decrees, applicable after being published in the Journal Officiel de la République française (official journal of the French Republic). They are created and updated based on scientific and technical developments. As of February 2023, there were 118 tables for the general social security scheme and 61 for the agricultural scheme.

4. French Complementary Health Insurance

In certain instances, despite non-compliance with conditions mentioned in the tables, the employee's disease can still be recognized as having an occupational origin, either because the criteria in the center and right columns are not met if a direct link is established with the professional activity (paragraph 6 in Article L. 461-1 of the Social Security Code [2]), or because the disease does not currently appear in a table and has caused the death of the victim or an impairment rating of at least 25% and a direct and essential link is established between this disease and the work (paragraph 7 in Article L. 461-1 of the Social Security Code [2]). The establishment of these links falls within the jurisdiction of the regional occupational disease recognition committee.

5. Procedure

First, it is necessary to establish a precise diagnosis. To achieve this, in view of the symptoms suggestive of a disease, an occupational physician generally addresses the worker to a medical specialist who will conduct exams to confirm and specify the diagnosis.

In all cases (presumption of origin or complementary system), it is up to the victim or their beneficiaries to make the request for recognition with their French social security body or administration where civil servants are concerned. Examination of the request must follow the adversarial principle (employer/worker).

6. The Occupational Diseases Most Frequently Recognized in France

For more than 20 years now, from about 80% to 85% of occupational diseases recognized by social security bodies are those affecting the musculoskeletal system (musculoskeletal disorders (MSDs)) and corresponding to tables RG 57 or RA 39 "Peri-articular diseases caused by certain work movements and postures", RG 69 or RA 29 "Diseases caused by vibration and shocks transmitted by certain machine tools, tools and objects and by repeatedly hammering objects with the palm heel", RG 79 or RA 53 "Chronic injury

of the meniscus", RG 97 or RA 57 "Chronic disorders of the lumbar spine caused by low- and medium-frequency vibration transmitted to the entire body", and RG 98 or RA 57bis "Chronic disorders of the lumbar spine caused by regular manual handling of heavy loads".

Between 2016 and 2021, there were an average 96 occupational diseases recognized per year under table RG 69. Osteonecrosis of the lunate (34%) and elbow arthritis (33%) are the most frequent disorders. Vascular disease represents 20% and angioedema roughly 10% of the disorders. Osteonecrosis of the scaphoid is anecdotal (slightly less than 3%). The sectors most frequently concerned are construction (structural work and finishings), civil engineering, and the automobile industry (manufacturing and repairs).

For diseases that do not appear in the tables, certain mental health effects (severe depression, generalized anxiety, and post-traumatic syndrome) resulting from psychosocial risks are at the top of the list, with several hundreds of cases recognized each year, which have been significantly more common in the past few years.

All of the tables, together with comments, can be consulted on www.inrs.fr/mp (accessed on 11 April 2023).

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