



ITALIAN REPUBLIC
IN THE NAME OF THE ITALIAN POPULATION
THE COURT OF APPEALS OF TURIN
LABOR SECTION

Consisting of:

Dr. Rita MANCUSO	PRESIDING JUDGE
Dr. Caterina BAISI	PANEL JUDGE
Dr. Silvia CASARINO	REPORTING JUDGE

delivered the following

S E N T E N C E

in the labor case registered under no. **721/2017** R.G.L. instituted by: **ISTITUTO NAZIONALE PER L'ASSICURAZIONE CONTRO GLI INFORTUNI SUL LAVORO – I.N.A.I.L.** (National Institute for Insurance against Labor Accidents) -, located in Rome, at Via IV Novembre no. 144, in the person of the pro-tempore Regional Director of Piedmont, represented and defended by general power of attorney to appear in court, Roman Notary from Chivasso on 08/07/2013 rep no. 55082, Register No. 16699 by Attorneys Loretta Clerico and Elia Pagliarulo, and electively domiciled in Turin at Corso Galileo Ferraris no. 1 at the INAIL Regional Attorney's Office.

APPELLANT

AGAINST

ROMEO ROBERTO, residing in Leinì (TO), at Via Lamarmora

no. 11, represented and defended by proxy stated at the bottom of the introductory appeal of the first instance judgement, jointly and severally, by the Attorneys Renato Ambrosio, Stefano Bertone and Chiara Ghibaudò, and electively domiciled at their firm located in Torino, at Via Bertola n. 2

APPELLEE

subject: occupational disease

CONCLUSIONS

For the appellant:

as per the appeal filed on 8/31/2017

For the appellee:

as per the defense statement filed on 10/22/2018

FACTS OF THE CASE

Mr. Roberto Romeo called INAIL before the Court of Ivrea, arguing the professional nature of the right acoustic neurinoma that he is affected by, as a pathology contracted due to the abnormal use of cell phones during the period 1995-2010, when he worked at Telecom s.p.a., and therefore, asked for the defending Institute to be sentenced to pay him the benefit due by law, commensurate with the percentage of disability, indicated as at least 37%.

INAIL contested the plaintiff's request and asked for its rejection. The case was investigated through the examination of some witnesses and with two Court-appointed, expert, medical-legal witness reports (one on the causal link and the other on the amount of permanent disability). With sentence no.

96/2017 published on 04/21/2017, the Court, in acceptance of the appeal, sentenced INAIL to pay the appellant the benefit due with reference to a 23% disability, with the order to reimburse the appellant for the litigation costs and to pay the costs of the administrative Court.

INAIL appeals; the appellee opposes.

New Court-appointed, expert, medical-legal witnesses were arranged (jointly entrusted to Dr. Carolina Marino and Dr. Angelo D'Errico, the former a legal-medical specialist and the latter a specialist in occupational medicine, Medical Director of the Servizio Sovrazonale di Epidemiologia ASL TO3 [Suprazonal Epidemiology Service Local Health Authority TO3]) for the hearing on 12/03/2019. At the conclusion of the discussion, the Court decided the case as per the separate operative part of the judgment.

REASON FOR THE DECISION

The Court accepted the appeal, noting that:

-the claimant, as contact person/coordinator of other Telecom employees, used cell phones in an abnormal manner during the period 1995-2010, as demonstrated by preliminary testimony (Musso, Nani, Bilucaglia witnesses);

-based on this, it should be considered that the claimant, coordinating about fifteen colleagues, in the most conservative assumption, used his phone for at least two and a half hours per day (2 phone calls x 5 minutes x 15 colleagues), and that, at most, he spent more than seven hours on the phone (3 phone calls x 10 minutes x 15 colleagues), to which is added the time spent on the phone to report to superiors and to coordinate with the

institutions' labor manager and with external firms that they collaborated with for labor matters, as well as on the weekend, as confirmed by the witness, Romeo, the claimant's son;

-moreover, at the time, there were no tools to mitigate exposure to radiofrequencies, and this was aggravated by the type of technology used for the first mobile phones (ETACS technology) and by the fact that, often, its use occurred inside an automobile;

-scientific literature is divided on the harmful consequences of cell phone use: on the one hand, the International Agency for Research on Cancer (IARC), part of the World Health Organization (an impartial and authoritative global entity), on 5/31/2011 announced an assessment of exposure to high frequency electromagnetic fields defining them as "possible carcinogens for humans" (category 2B); on the other hand, the Interphone study identifies a 40% higher risk for glioma (a family of tumors to which the tumor that affected the claimant belongs) in individuals who have used cell phones for long periods of time over long periods of time; the only scholars who firmly exclude any causal link between the use of cell phones and brain tumors are Professors Ahlbom and Repacholi, but said authors are in a position of conflict of interest, the first being a consultant for cell phone operators and the second for electrical industries;

-the results achieved by the studies financed by cell phone companies cannot be considered

particularly reliable in consideration of the authors' position of conflict of interest, as ruled by the Supreme Court in sentence no. 17438/2012 in a case relating to another brain tumor (Gasserian ganglion neurinoma);

-the Court-appointed expert witness has ascertained the existence of the causal link;

-therefore, and considering the peculiarities of the specific case (association between a rare tumor and rare exposure in terms of duration and intensity; latency period consistent with the values relating to non-epithelial tumors; the fact that the pathology arose in the right side of the claimant's head, right-handed subject; lack of other plausible explanation of the disease), a causal link, or at least concausal, between technopathy and exposure must be considered proven, based on the "more likely than not" rule;

-permanent disability should be recognized at measurement of 23%, as per the conclusions of the Court-appointed expert witness, not contested by any of the parties.

With the first ground of appeal, INAIL complains that the Court failed to rule on the objection of inadmissibility of the appeal, pursuant to article 152 avail. att. c.p.c. (code of civil procedures) due to the lack of certificate of qualification of requested services. The reason is unfounded, as the Constitutional Court declared the unconstitutionality of this rule with sentence no. 241 dated 11/20/2017.

With the second ground, the Institute maintains that the Court erroneously held that the abnormal cell phone use for 15 years had been proven for work needs, as the testimonies on this point were contradictory. Specifically, according to the testimony of witness Bilucaglia, the duration of the phone calls (and therefore, the exposure to radiofrequencies) was one hour and forty minutes a day, while according to what the witness Musso said, it lasted up to 10 hours, an unlikely duration as it exceeded the length of the workday itself. Furthermore, according to what emerged from the witness investigation, the telephone calls between the appellee and colleagues also took place via a landline phone, and, on the other hand, the son of the appellee was unable to quantify the amount of telephone calls his father received outside of work hours when he was available. Nor on the basis of the witnesses' testimony is it possible to determine the quantity and duration of phone calls inside the car.

Although it cannot be assumed, contrary to what the appellee claims, that the historical circumstances related to the exposure are proven not to have been contested by INAIL pursuant to Articles 115 and 416 paragraph 3 c.p.c., since these facts are not known to the Institute, and therefore it is unable to contest or not, the reason is unfounded.

The preliminary testimony has, in fact, confirmed the remarkable exposure of Mr. Romeo to radiofrequencies for cell phone use during the period 1995-2010.

The witness, Musso, colleague of the appellee from 1990 to 2010, reported that the appellee coordinated his activity and that of the other external technicians (of which, the appellee was the hierarchical superior), totaling 15-20 people. The witness stated that he spoke with the appellee every day several times a day, about 2-3 times a day or even more, with the calls lasting 5-10 minutes each.

The witness, Nani, colleague of the respondent from 2000 to 2011, said he had spoken with him often, even a couple of times an hour, and that the phone calls lasted 5 minutes, or even less.

The witness, Bilucaglia, who worked with the appellee from the early 1990s to 1996, stated that the latter coordinated about 10-12 colleagues, and they were in contact 2-3 times per day with phone calls that lasted 5-10 minutes each.

As noted by the Court, the appellee's phone calls also were exchanged with the labor manager, with external companies, and with superiors (see witnesses Musso and Bilucaglia).

Therefore, excluding the maximum values (which are obtained considering the highest number of telephone calls made by the technicians to the appellee and their maximum duration, as indicated by witnesses) and taking into consideration the minimum number and the average number of telephone calls of each technician (2 and 2.5 respectively) for the number of them (15-20 according to Musso, 10-12 according to Bilucaglia), according to the testimonies of Musso and Nani, an exposure is obtained from a minimum of 3.30

hours per day (200 minutes) to an average of 5 hours per day (300 minutes), and, according to Bilucaglia's testimony, from a minimum of 1 hour and 40 minutes (100 minutes) to an average of 3 hours and 50 minutes (230 minutes).

Therefore, even with the degree of precision compatible with the fact that this is referring to circumstances which, even after a considerable measure of time, are repeated over a long period, and even with an inevitable degree of variability, in the opinion of the Court, the preliminary framework allows a very high exposure to radiofrequencies to be deemed proven, which should be prudently quantified as approximately 4 hours per day for the entire period referred to in the appeal.

At the time, there were no tools that would allow for the avoidance of direct contact between the cell phone and the face, such as headphones or earphones (see witness Musso, and see witness Nani, according to which the headphones, which were personally purchased by Telecom technicians, started to be used from the beginning of 2000, and, in the same sense, see witness Bilucaglia). It is true, as noted by INAIL, that the appellee had an office equipped with a landline telephone (see witness Musso) but the witnesses reported that they contacted him on his cell phone, as it was easier to find him, considering that he often traveled around outside of the office, and it was not as easy to reach him on the landline phone, as in this case, it was necessary to go through the switchboard (see witnesses Musso, Nani, Bilucaglia).

Then, ETACS technology emerged (that, as will be said later with reference to the Court-appointed expert witness report carried out to this degree,

emitted much more powerful radiofrequencies than those currently used by cell phones) and lasted about 7 years (witness Musso, see also witness Nani, who stated that as of 2000, GSM technology dominated; in the same sense, see witness Bilucaglia).

These circumstances made the exposure, which was already prolonged, particularly intense.

The appellee's son, heard as a witness, then confirmed that his father is right-handed.

With the third ground of appeal, INAIL argues that the Court's conclusion was erroneous with regard to the existence of the etiological link between the disease and occupational exposure to radiofrequencies.

Specifically:

- observes in the first place, that acoustic nerve neurinoma is not a charted disease, so the burden of proving the professional nature that caused the pathology lies with the claimant;

- criticizes the Court-appointed expert witness report, highlighting material errors therein and arguing that they arrive at incorrect conclusions, since said conclusions are not supported by generally accepted scientific law or, at least predominately agreed upon by scientific law;

- deduces that the Court-appointed expert witness, whose conclusions were acknowledged by the Court, was based on the 2013 IARC classification, without adequately accounting for subsequent studies, and did not correctly assess the meaning of the classification

of radiofrequencies in relation to carcinogenic evidence, i.e. as category 2B (“possibly carcinogenic to humans”), and therefore, is the weakest among those used by the Agency to classify agents with positive evidence of carcinogenicity (compared to category 2A, “probably carcinogenic to humans” and category 1, “carcinogenic to humans”);

-argues that the Interphone study must be considered reliable, as an independent case-control study, admittedly with only partial funding from cell phone industries and cell phone operators, as must Hardell’s studies be considered reliable. These studies and the further ones, albeit with limitations highlighted by the report by Dr. Grandi (researcher of the INAIL Department of Medicine, Epidemiology, Occupational and Environmental Hygiene), produced to this degree, do not support the association between the use of cell phones and the onset of cancer;

-argues that, unlike what is claimed by the Court-appointed expert witness (and shared by the Court), the mechanisms of action of radiofrequencies are not known;

-claims that it is not proven that the appellee (right-handed) always used the cell phone at his right ear;

-argues further that it is incorrect, as the Court did, to infer a cause-effect link from the coexistence of two rare phenomena

(in this case, a rare tumor and rare exposure to radiofrequencies); -finally, argues that a tumor latency period (according to scientific doctrine, at least 10 years) has been erroneously considered compatible with exposure to radiofrequencies since 1995, considering that the tumor (very slow-growing) was already appearing in December 2009, and, therefore, the individual risk of 1.44 reported instead, by the Court-appointed expert witness, is not applicable.

In light of the Court-appointed expert witness in this instance, this ground for appeal is unfounded.

The Expert Consultants correctly complied with the question formulated by the Court order dated 01/16/2019 in which they were required to carry out expert assessments based on an exposure equal to 4 hours a day (as demonstrated by the preliminary testimony previously mentioned), albeit by mere error. In the assignment report on 03/19/2019, reference was made to the question formulated in the first instance, which did not specify the duration of the exposure. Therefore, in accordance with the exposure times indicated in the question given, a working time of cell phone use was estimated to be 840 hours/year (4 hours x 210 work days) with an estimated overall time of use in the interval of 15 years between 1995 and 2010 equal to 12,600 hours (840 hours/year x 15 years) (see page 51 of Court-appointed expert witness report).

The experts also considered that, as emerged from the investigation, the cell phones the appellee used until the end of 1999 were analog (they used ETACS technology), and then, as of 2000, they were digital (they used GSM technology), highlighting that “*Analog and digital phones based on GSM 2G technology were characterized by much higher radiofrequency (RF) emissions than the current 3G and 4G digital emissions, with RF emission intensity levels nearly two orders of magnitude higher (IARC, 2013) or almost 100 times higher*” (see pages 51-52 of the Court-appointed expert witness report, statement taken from the IARC Monograph (2013) on radiofrequencies, as specified by the Expert Consultants on page 121 of the report).

Given that acoustic neurinoma (or vestibular schwannoma, indicated for brevity by the Court-appointed expert witness as “AN”), a rare and slow-growing, benign brain tumor, is characterized by a latent period from the beginning of exposure to a risk factor until the time of the diagnosis of the illness equal to no less than 10-15 years (see page 54 et seq.), the Expert Consultants cited numerous studies on the subject, acknowledging that most of them are case-control studies which were conducted by the Interphone working group and by the research group from University of Orebro, Sweden led by Professor Hardell, highlighting their characteristics and methodologies, as well as the limitations and criticisms made about them in scientific literature (see page 58 et seq.).

After the Interphone study published in 2010 on the relationship between CP (cell phone) exposure and gliomas and meningiomas (which did not include AN), “*In 2011, the INTERPHONE study group published, in another article, the results of the international case-control study on the use of cell phones and the risks of developing acoustic neurinoma which included more than 1,000 cases and over 2,000 controls enrolled between 2000 and 2004 (INTERPHONE, 2011).*”

This study found no difference in previous exposure to CP in cases and controls for “regular use” defined on the basis of at least one call per week.

*On the contrary, it observed a **statistically significant excess of risk of developing AN** (almost 3 times in exposed subjects compared to unexposed subjects), **in subjects** classified in the highest exposure class corresponding to an **overall CP use of greater than 1,640 hours** (translatable into average exposure duration of 1 hour per day for 4 years, or 2 hours per day for 2 years or half an hour per day for 8 years),” also stating that the results of the study showed in the class with higher cumulative exposure (overall cell phone use greater than or equal to 1640 hours) a statistically significant association of AN with ipsilateral cell phone use only (OR, or Odds Ratio, = 3.74), so that “*As it is acknowledged that, and also observed by Cardis (Cardis, 2008) the radiofrequencies (RF)/electromagnetic emissions emitted by portable phones*”*

*are primarily absorbed by the side of the head to which the portable telephones are held during use (so-called **ipsilateral use**) and that with increasing distance of the telephone from the head, the dose of electromagnetic radiation absorbed by tissues decreases abruptly, the finding of a statistically significant association of AN only with the ipsilateral use of CP supports the hypothesis that RF emitted by CPs play a causal role in inducing/developing an AN.”*

In reference to one of the appellant’s previously reported observations, the Court notes that, not contested and confirmed by the testimony of the appellee’s son that the former is right-handed, the fact that one tends to use the telephone, exclusively or almost exclusively, by supporting it to the ear of the “dominant” side of the body, falls within well-known fact, as it is usually found in common experience.

The Expert Consultants then cited the 2011 IARC (International Agency for Research on Cancer) classification, according to which the radiofrequencies are “possibly carcinogenic to humans,” an assessment confirmed in the 2013 monograph on non-ionizing radiation, highlighting that in April 2019, an IARC Advisory Group, composed of 29 researchers from 19 countries, included radiofrequencies among the agents for which a carcinogenicity reassessment by the IARC in the period 2020-2024 is considered a priority (IARC Monographs Priorities

Group, 2019). Then, they mentioned later studies (see pages 68-69).

In the table drawn up by the Expert Consultants on pages 70 and 71 of the report, the characteristics and results of the epidemiological studies published on the association between the use of CP and AN are reported, relating to the risk of AN estimated for subjects with the highest cumulative exposure in each study in terms of duration of exposure, cumulative duration of exposure time, or the duration of the telephone subscription service, also divided by the ipsilateral and contralateral use with respect to the onset of the tumor.

As noted by the Expert Consultants, the examination of the table shows the majority of the studies show excess risk associated with a long duration of use or cumulative exposure to CP, which in various studies are statistically significant, with higher risks associated with ipsilateral use of CP.

The report highlights *“The fact that in studies in which the risk of AN is estimated based on the number of cumulative hours of use, the category with the highest estimated cumulative exposure (which finds the highest number of hours of 1640 hours in the 2011 INTERPHONE study) has a limit that is at least about 8 times lower than the number of hours (approximately 12,600 hours) of CP use estimated in the case of Mr. Romeo”* (see page 69 Court-appointed expert witness report).

The Expert Consultants then examined the evidence from experimental studies on animals, published after the 2013 IARC monograph, one of which was conducted by the Ramazzini

Institute and the other by the United States National Toxicology Program (NTP). The first observed a statistically significant increase in Schwannoma of cardiac Schwann cells in male rats, although it is estimated in a limited number of cases (3 cases in the highest exposure group vs. 0 cases in the unexposed group), and a non-statistically significant increase in cardiac Schwann cell hyperplasia, which constitutes a pre-tumor lesion, in both sexes (Falcioni et al., 2018); and the second also showed, in male rats, an increased number of cases of cardiac Schwannoma, compared to unexposed male rats, which was statistically significant for both CDMA radiofrequency exposure (3 cases in the intermediate exposure group, 6 cases in the group with the highest exposure, and 0 cases among the non-exposed) and GSM exposure (5 cases in the most exposed group and 0 cases among the non-exposed) (NTP, 2018).

The Expert Consultants specified that “*cardiac Schwannomas are of the same histological type as acoustic nerve neurinomas (which, in fact, are also called vestibular Schwannomas), which supports a causal relationship between radiofrequency exposure and incidence of AN*” (see Court-appointed expert witness report page 76).

Based on these elements, the Expert Consultants concluded that “*In the specific case in question, the risk deriving from the professional use of cell phones is definitely aggravated primarily in relation to the long*

period of exposure (15 years) and the high intensity of exposure, the latter due both to the type of cellular telephone devices used (ETACS and then, GSM 2G, with emissions levels close to 100 times higher with respect to modern cell phones) and to the high number of hours of cell phone use (with an average exposure of 840 hours/year, resulting in overall exposure in 15 years estimated to be on the order of 12,600 hours).

Therefore, also in light of the results of the most recent animal studies conducted by the NTP and the Ramazzini Institute (that show an excess of tumors of the same histological type as the AN, even if elsewhere) and the recent indications of the IARC Advisory Group on the need for a priority reassessment by the IARC of the carcinogenicity of radiofrequencies, considering that the results of the epidemiological studies available, which, although not entirely concordant, still frequently show an excess of cases of AN in the presence of prolonged exposure or intense exposure, it is believed that, in this specific case in question, with a criterion of high logical probability, an etiological link can be assumed between the prolonged and conspicuous occupational exposure to radiofrequencies emitted by cell phones and the disease reported by the expert to INAIL (neurinoma of the right eighth cranial nerve)” (see preliminary conclusions page 77-78, reiterated on pages 123-124 in the conclusions and answers to questions).

The conclusions are based on an accurate and up-to-date examination of scientific literature sources, applied to the peculiarities of this specific case (for quantity and duration of exposure), in the absence of alternative risk factors, according to probabilistic certainty standards (“more likely than not”).

With respect to the conclusions of the Expert Consultants, the INAIL Consultants made detailed observations (reported on pages 79-80 of the report), while the defendants of the appellee underlined the position of conflict of interest of some authors of studies who denied the carcinogenicity of radiofrequencies (see pages 84-97 expert witness report), in particular, in the context of the literature cited by INAIL (see pages 94-95).

The Court considers that the Expert Consultants have provided exhaustive answers regarding the observations of the Consultants of the appealing party.

Particularly:

1) the data relating to the exposure on which the Expert Consultants relied is not, as claimed by the INAIL Consultants, taken “*substantially from the patient history information reported by the insured*” but rather, as already observed, is the subject of the question formulated by the Court with reference to the circumstances proven by the primary testimony already described above;

2) with reference to criticisms on reliability of the studies according to which there is an etiological link between exposure to

radiofrequencies and the acoustic neurinoma, the Expert Consultants made the following detailed replies:

a) with respect to the possible distortions (“*bias*”), the Expert Consultants illustrated the differences between case-control studies and cohort studies, specifying that, in the case in question, the literature is almost entirely made up of case-control studies. In this type of study (unlike cohort studies, which yield the ratio between the incidence of the disease in the population exposed to the risk factor and the incidence of the same disease in non-exposed populations), the relative risk (RR) is approximated by another risk indicator, namely the Odds Ratio (OR), which is calculated on the basis of the ratio between the frequency of exposure to the risk factor among (sick) cases compared to the frequency of exposure to the risk factor between controls (not sick).

This makes non-differential misclassifications (affecting both cases and controls to the same extent) possible, which, as highlighted by the Expert Consultants, always results in an underestimation of the risk compared to the real risk of disease due to exposure, and the most serious threat to the validity of the results is constituted by a form of differential misclassification of the exposure called “*recall bias*,” due to the possibility

that subjects suffering from tumor disease search in their memory for data relating to their previous exposure to possible health risk factors that may have caused this disease.

However, the results of the available studies (the study by Vrijheid et al., 2009, the study by Aydin et al., 2011, and the study of Petterson et al., 2015) indicate that studies on CP exposure and the risk of AN have been affected by a differential misclassification of exposure to RF by CP, such as to overestimate the exposure between cases compared to controls and, therefore, a consequent overestimation of the risk of AN associated with exposure to RF from CP. On the contrary, both the results of these studies and those of other studies that evaluated the validity of exposure to “self-reported” CP in healthy subjects (i.e. reported by the same subjects included in the study and detected by means of a questionnaire or interview administered to them) indicate the presence of a strong non-differential misclassification of exposure (Samkange-Zeeb et al., 2004; Toledano et al., 2014; Vanden Abeele et al., 2013), with consequent underestimation of the strength of association between CP exposure and the risk of AN compared to the real risk, so that the risk estimates (OR) obtained in the different studies would be highly underestimated and the real risk of developing AN would be much higher than observed in the studies themselves (see pages 99-103 Court-appointed expert witness report);

b) also, with regard to the ipsilateral nature of cell phone use with respect to the side of tumor appearance, the available studies (Shimizu and Yamaguchi, 2012) highlight the possibility of a strong, non-differential misclassification, with consequent underestimation (see page 103 of the Court-appointed expert witness report);

c) unlike what was claimed by the INAIL consultants, a dose-response effect, i.e. a significant increase in the risk of developing tumor disease (AN) as the cumulative dose of exposure to RF from CP increases, is present in the results of the pooled analysis by Hardell et al. (2013), as shown in the table on p. 104 of the report, which shows a progressively increasing risk of AN associated with the use of cell phones as the cumulative dose of exposure to CP increases (calculated based on the hours of CP use): see pages 103-105 of the Court-appointed expert witness report;

d) a possible reason for the lack of a dose-response effect in the Interphone study (2011) and in other studies is that the cumulative exposure categories used were too low. For example, in the Interphone study, the lower limit for the highest cumulative exposure category was set at only 1,640 hours of CP use, corresponding to less than half an hour a day for 10 years. As noted in the expert report, an exposure dose below this limit may not be sufficient to determine the development of AN (see page 105 of the Court-appointed expert witness report);

Furthermore, it is an exposure dose, as emerges from the report, that is absolutely not comparable with the massive and prolonged exposure to radiofrequencies suffered by the respondent for 15 years;

e) the statement by INAIL Consultants, that hearing impaired subjects, who have hearing aids that they use daily for the entire day with an attached Bluetooth function have never found cases of acoustic neurinomas is not supported by any bibliographic reference (see page 107 of the Court-appointed expert witness report);

f) contrary to what was claimed by the INAIL Consultants, the pathology trend for which it is causing (schwannoma of the VIII cranial nerve) shows an increase of this disease over the last few decades, coinciding with the spread of cell phones. The Expert Consultants indicated the various studies on the issue on pages 55-57 of the report, noting that, according to some of them, the increase in incidence of the disease would be attributable to the improvement of instrumental techniques – based on the diffusion of new technologies such as CT and MRI – used to diagnose this tumor; but noting, however, that studies based on the most recent data show a further increase in the incidence of AN, also referring to periods in which the diffusion of the best diagnostic tools for these tumors had already occurred (Kleijwegt et al., 2016: increase in the incidence of AN in the Leyden region by more than 3 times in a

time span of 11 years between 2001 and 2012; Marinelli et al., 2018: an increase in the incidence of AN in Minnesota, USA, more than 2 times in a time span of 11 years between 1995 and 2016; also in the USA, the Central Brain Tumor Registry, CBTRUS, published an annual report from 2007 to 2016 with data recorded from 2004 to 2013 that show a doubling of the annual incidence of AN: from 0.88 to 1.73 x 100,000). Page 108 of the report recalled Danish Tumor Registry data that show an increase in incidence of brain tumors between 2001 and 2010, with an increase of 40% among men and 29% among women (Sundhedsstyrelsen, 2010). Therefore, the conclusion of the Expert Consultants that it is unlikely the increase in the incidence of AN is solely attributable to the possibility to get more diagnoses of AN - deriving from the refinement of diagnostic methods of said tumor or even from greater accessibility of the population to health facilities - is acceptable.

3) With reference to the NTP and the Ramazzini Institute studies, on the critical observations of their scientific validity by INAIL Consultants, also through reference to the very recent article published by the International Commission on Non-ionizing Radiation Protection (ICNIRP) in Health Physics, Expert Consultants (see pages 108-113 of the report) have exhaustively repeated that:

- these are the largest experimental animal studies conducted so far and are characterized by high standardization of research protocols and high quality of the methods used;

- the main purpose of conducting experimental studies on tumors in animals is to evaluate whether or not exposure to a suspected carcinogen causes excess tumors in the groups of exposed animals. Therefore, the fact that different exposure times and modalities can be envisaged for the animals under study compared to those of humans (for rodents, unlike for humans, "total body" and for the whole life), does not make the study results less valid.

Furthermore, with reference to the observation of the INAIL defense during the oral debate about the unreliability of these studies as they were not carried out on humans, the Court considers the reply of the Expert Consultants to be exhaustive and acceptable (also through reference to sources of scientific literature on the NTP study) according to which the rational criterion for conducting carcinogenicity studies in animal models *"is based on experimental data showing that every agent that is known to cause cancer in humans has been shown to be carcinogenic in animals when adequately tested (IARC, 2006) and that almost one-third of human carcinogens were identified after carcinogenic effects were found in well-conducted animal studies (Huff, 1993). ... There is no reason to believe that a physical agent such as RFR would affect animal tissue but not human tissue"* (Melnick, 2019, cited

on pages 76-77 and 109 of the report). Experiments on the carcinogenicity of agents or substances are usually carried out on animals, such as rodents, that present elements of similarities with humans, so that the scientific value of the results of the study is not prejudicially negated;

- the fact that excess tumors were only found in rats (and almost exclusively in males) does not affect the validity of the study, considering that cardiac schwannoma occurs in different varieties of rat strains (and more frequently in males), but has never been seen in mice;

- notwithstanding, in the Ramazzini Institute study, the rats' exposure occurred at the maximum dose tested, the specific absorption rate resulting for the exposure was just above the maximum limit for irradiation to the whole body for humans. Meanwhile, as for the NTP study, although the exposure dose is much higher than the maximum allowable exposure limit for irradiation to the whole body for humans, the dose absorbed locally is only a small part of the dose administered to the whole body, and, particularly for the brain, the absorbed dose was estimated at about 10% of the total dose administered to the whole body;

- the number of cases of tumors found in the animals is statistically significant in the NTP study: 6 cases in the group with the highest exposure to CDMA RF and 5 cases in the group with the highest exposure to GSM RF, while no cases were verified in the unexposed group. In the Ramazzini Institute

study, 3 cases were observed in the highest exposure group and none in the unexposed group;

-with regard to the different locations of the schwannomas found in rats exposed in the NTP and Ramazzini Institute studies (located in the heart instead of in the brain), it seems probable that the irradiation modality of the animals influenced this result, in how much the administration of RF was addressed to the whole body and not concentrated to only the head of the experimental animals, as is the case for exposure to RF in CP users;

- cardiac schwannomas are of the same histological type as acoustic nerve neurinomas (which, in fact, are also called vestibular schwannomas), which supports a causal relationship between radiofrequency exposure and the incidence of AN. Therefore, the fact that the ANs are benign tumors, as opposed to the malignant cardiac schwannomas observed in the rats from the NTP and Ramazzini Institute studies, appears irrelevant, considering that these studies show that RF exposure can lead to a neoplastic transformation of the Schwann cells, a process both benign and malignant tumors have in common;

- the NTP study concluded by stating that the results demonstrate clear evidence of carcinogenic activity of RF (NTP, 2018);

- carrying out multiple comparisons in the analyses conducted in both the NTP and Ramazzini Institute studies certainly increased the risk of spurious associations occurring in these two studies, but the probability that three independent analyses found a significant increase in developing tumors of the same histological type and in the same anatomical site only by chance is very low, which unequivocally support the carcinogenic effect of RF, even considering the many comparisons made in analyses;
 - the presence of a carcinogenic effect is also supported by the observation of a significant increase in DNA damage, evaluated with the Comet assay method by means of the presence of DNA breaks in various organs, especially in the brain, in both rats and mice (Wyde, 2016);
 - unlike what was claimed by the INAIL Consultants, the analyses were conducted “blindly” (see Melnick’s 2009 article in response to the ICNIRP’s criticism regarding the NTP study);
- 4) Regarding the reason why the IARC Advisory Group has included radiofrequencies among the agents for which a carcinogenicity reassessment by IARC in the period 2020-2024 is considered a priority (according to the INAIL Consultants, not for any particularly alarming reasons, but as a re-evaluation falling within the normal procedures for periodic updating of the assessments of carcinogenic evidence promoted by the Agency), the table shown in the article is transcribed in the expert report,

which shows that non-ionizing radiations (radiofrequencies) are among the agents for which an urgent (“high priority”) reassessment of carcinogenicity for humans is recommended, an indication, specified in the table itself, motivated by the fact that the new evidence deriving from biological and mechanistic tests *“requires a re-evaluation of the classification.”* In the Advisory Group article, it is also specified that the priority for the reassessment was assigned on the basis of evidence on human exposure and on the basis of the degree of evidence available to assess carcinogenicity (see pages 113-115 of the Court-appointed expert witness report);

5) As for the INAIL Consultants’ observations about the incompatibility of the evolution of the appellee’s pathology (since the tumor was already 2.6 cm in size in 2010 compared to a growth rate of 1.5 mm per year) and the latency periods of the same (over 15-20 years, not less than 10-15 years), the Expert Consultants observed that, according to the author quoted by the INAIL Consultants (Dr. P. Ferroli, Besta Institute of Milan) the tumor’s growth rate of about 1.5 mm per year refers to about 75% of acoustic neurinomas, while a quarter of them tend to grow more rapidly and in a more aggressive way (see page 116 of the Court-appointed expert witness report). Additionally, the Expert Consultants, on pages 116-117 of the report, cited extensive scientific literature in which the growth rates of acoustic neurinoma are quite variable. Specifically, in the case of AN characterized by cystic and hemorrhagic

phenomena (such as that of the appellee), growth rates of over 4 mm/year were observed (Paldor et al., 2016), and, in the Paldor review, some case reports are also cited in which cases of AN with growth rates up to 25 mm/year have been described (Fayad et al, 2014).

The conclusion on the point of the Expert Consultants, therefore, appears to be shared, according to which *“AN growth rates observed in the scientific literature, the presence in the case in question of cystic-necrotic phenomena (also cited by INAIL Court-appointed expert witnesses) and the long period between the first exposure and the AN diagnosis (15 years) are certainly not suitable elements to justify an exclusion of the causal link between exposure to RF from CP and the onset of AN, as claimed by the INAIL Court-appointed expert witnesses.*

On the contrary, this data represents elements absolutely compatible with the existence of the finding of an AN with a size of 2.6 cm at the time of diagnosis in a subject exposed to RF from CP for 15 years in the case in question” (see page 117).

6) Therefore, considering the exposure period of the appellee to radiofrequencies (from 1995 to 2010, the year in which he was diagnosed with AN), the time elapsed between the start of exposure and the appearance of the tumor (equal to 15 years, and not at 4 years as claimed by the INAIL Consultants) is absolutely compatible with the induction and development of AN on the basis of literature data, also considering 5 years for tumor initiation and 10 years for its development.

In addition, unlike what was claimed by the appellant's defense during the oral debate, there is no contradiction between the Expert Consultants' arguments on pages 115-118 regarding the latency of the disease, its development and the size of the tumor at the time of diagnosis in 2010 (2.6 cm), and what is written on pages 57-58 of the report on the latency period recognized in the scientific literature (at least 10-15 years), with the Expert Consultants being motivated on the compatibility between the latency period of the disease and the size of the tumor, mentioning (unlike the INAIL Consultants) copious scientific literature on the extreme variability of the average tumor growth, which also recorded cases of maximum values of 17 mm/year and even up to 25 mm/year (see pages 116-117 of the Court-appointed expert witness report).

- 7) There is no contradiction between the statement of the Expert Consultants (see note 25 on page 70 of the report) that "*It, therefore, appears unlikely that the possible effects of CP use on the incidence of ANs can be seen, at least on the data up to 2010, given the relatively recent spread of CP and the long induction period of these tumors*" and the statement of the existence of the etiological link in the present case, since the above sentence clearly refers to the fact that it seems unlikely that any effects of the use of cell phones could be seen in the epidemiological studies, since in the populations examined by these studies, the beginning of the exposure, for most of the subjects, was too recent, while in the case

in question, the appellee's exposure started in 1995, or 15 years prior to the diagnosis of the tumor (AN) and in a historical period in which CP were still not widespread, for the most part, in European Countries (see pages 118-119 of the Court-appointed expert witness report).

The Expert Consultants have therefore recognized the causal link by correctly taking into consideration the actual exposure of the appellee to radiofrequencies, which, due to its peculiarities (duration and intensity resulting from the abnormal use of the cell phone), has characteristics completely different from those averages found in general by the population in the period for which it is the cause;

8) regarding the INAIL Consultants' conclusions, which, in order to exclude the causal link, refer to the ISS document, ISTISAN 19/11 report, the Expert Consultants have exhaustively replied that,

“the ISTISAN report on RF and tumors has been criticized by the Doctors for the Environment (ISDE, acronym for International Society of Doctors for the Environment) for various reasons (Di Ciaula, 2019), including: the selection of studies included in the meta-analyses presented; the interpretation of the associations observed between RF and intracranial tumors; the inappropriate use of data on the trend in incidence of brain tumors to refute the association between RF and brain tumors; not having taken into account in their evaluation the results of recent experimental studies on animals, ... , that showed carcinogenic effects on rats (NTP, 2018; Falcioni et al., 2018) and, above all, for not having

obtained the declared uncertainty about the effects associated with intense and prolonged use of CP with more stringent recommendations on RF exposure limits, in particular for children and adolescents, who may be more susceptible to these effects (Di Ciaula, 2019) (see page 119 of the Court-appointed expert witness report).

The Expert Consultants then mentioned the report by ANSES (French National Agency for Food, Environmental, and Occupational Health and Safety) on the effects of waves emitted by cell phones on health, which concludes by pointing out that the scientific studies published to date do not allow to exclude the appearance of biological effects for humans beyond certain thresholds of RF exposure from CP, also highlighting that 76% of cell phones examined emit radiofrequencies higher than the maximum limit recommended by the ICNIRP for head and trunk exposure (see pages 119-121 of the Court-appointed expert witness report).

In the opinion of the Court, the Expert Consultants replied point by point to the observations of the INAIL Consultants, mentioning copious scientific literature in support of their arguments, and providing, in conclusion, solid elements to affirm a causal role between the appellee's exposure to cell phone radiofrequencies and the pathology which it is causing.

The epidemiological data, the results of animal experiments (not contradicted, at present, by other experiments of the same type), the duration and intensity of exposure (absolutely peculiar for their abnormality), which assume

particular importance considering the ascertained - at a scientific level - dose-response relationship between exposure to radiofrequencies from cell phones and the risk of acoustic neurinoma, together with the lack of another factor that may have caused the disease, assessed as a whole, allow us to believe that, in this specific case, there is a scientific law of coverage that supports the affirmation of the causal link according to probabilistic criteria (“more likely than not”).

In fact, much of the scientific literature that excludes the carcinogenicity of exposure to radiofrequencies, or that at least maintains that the researches reached opposite conclusions, cannot be considered conclusive, as also highlighted by the Expert Consultants commenting on the observations of the defense of the appellee (reported on pages 84-97 of the report), is in a position of conflict of interest, however, not always declared: see in particular, on page 94 of the report, the observation of the defendant's defense (in no way contested by the counterparty) that the authors of the studies indicated by INAIL, listed by name, are members of ICNIRP and/or SCENIHR, which have received industry funding directly or indirectly.

In this regard, the Expert Consultants observed: *"Furthermore, in light of the extensive documentation on conflicts of interest of various researchers involved in the INTERPHONE study, also produced by the appellant's consultants, it is believed that less weight should be given to the studies published by*

authors who have not declared the existence of conflicts of interest and that greater weight should be given to the results of studies conducted by researchers free from such conflicts, such as studies carried out by Hardell and collaborators.

*In the case in question, conflict of interest situations can arise with respect to the evaluation of the health effects of RF, for example, those cases in which the author of the study has carried out consultancy for the telephone industry or has received funding from the telephone industry to conduct studies or (as also established by the Karolinska Institutet of Stockholm, in relation to the complaint filed against Professor Ahlbom, then dismissed from the presidency of the IARC working group on RF precisely because of his membership of the ICNIRP) if the author himself is a member of the ICNIRP (International Commission on Non-Ionizing Radiation Protection). In fact, **ICNIRP** is a private organization, whose RF guidelines have great economic and strategic importance for the telecommunications industry, with which several ICNIRP members have links through consultancy relationships ... Apart from possible links with industry, it is clear that ICNIRP members should refrain from evaluating the health effect of RF levels that ICNIRP itself has already declared safe and, therefore, not harmful to health (**Hardell, 2017**)" (see page 107 of the report).*

The Expert Consultants' approach is entirely acceptable, it being evident that the investigation and the conclusions by independent authors give greater guarantees of reliability than those commissioned, managed, or financed, at least in part, by subjects interested in the outcome of studies.

The extensive scientific literature cited and applied by the Expert Consultants, who are completely independent, must therefore be considered reliable, as well as the conclusions, at an epidemiological level, which they have reached.

Moreover, precisely in a dispute against INAIL relating to occupational disease (intracranial tumor) due to exposure to radiofrequencies from cell phones, the Supreme Court considered that *“The further emphasis on the greater reliability of these studies, given their position of independence, i.e. for not having been co-financed by the cell phone manufacturers, unlike others, constitutes a further and not illogical basis of the accepted conclusions”* (see Court of Cassation 10/12/2012 no. 17438).

Since this is an uncharted occupational disease with multifactorial etiology, the proof of the occupational cause, undoubtedly burdening the worker, by constant jurisprudence of legitimacy must be assessed in terms of reasonable certainty, and therefore, excluding the relevance of the mere possibility of professional origin, it can be identified in the presence of a significant degree of probability (see, among many, Cass. 4/10/2018

no. 8773), which, for the reasons illustrated, emerged from the Court-appointed witness arranged in this instance.

The percentage of disability to the extent of 23%, already recognized in the Court-appointed expert witness ordered by the Court and confirmed by the consultancy carried out in this instance, was expressly accepted by the appellee (see page 3, point a, appealed brief).

In conclusion, the appeal must be rejected.

The expenses of this proceeding follow the loss and are settled in accordance with the parameters in force, taking into account the value of the case and the defensive activity carried out, payable to the defenders.

The expenses of the Court-appointed expert witness, given the conclusions reached, must be definitively borne by INAIL.

The rejection of the appeal is followed by law (Article 1, paragraphs 17-18, Law 228/2012) the declaration that the conditions exist for the further payment, to be paid by the appellant, of an amount equal to that of the unified contribution due for the appeal.

FOR THESE REASONS

Regarding article 437 c.p.c.,

the appeal is rejected;

INAIL is sentenced to reimburse the appellee for the expenses of the proceedings, in the amount of 10,000.00 euros, plus lump-sum reimbursement of the VAT and CPA (Lawyers Provident Fund) payable to the defenders;

the appellant is responsible for the Court-appointed expert witness fees, paid as per separate decree;
the existence of conditions for further payment by the appellant is declared, for the amount equal to that of the unified contribution due for the appeal.

As such, the Court has decided at the hearing on 12/3/2019

THE REPORTING JUDGE

Dr. Silvia CASARINO

THE PRESIDING JUDGE

Dr. Rita MANCUSO

