Epidemiological study of injuries among French rope access technicians

An analysis of working conditions and injury typology
Contributors to this study
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Note to readers

This report is intended to be accessible to the widest possible audience. It has a standard structure: an introduction describing the context, the issues at hand, the methodological choices made and a quick snapshot of the population surveyed. Each part is dissociable and attempts to describe 1) working conditions in the profession, 2) the lifestyle of rope access technicians, 3) their injuries, and 4) the relationships between these factors and the injuries sustained.

In the last few years, the rope access sector (in the wider sense) has commissioned a number of studies to better understand the profession and its specificities. It has also set up training and risk prevention programmes to protect rope access workers. Our research is in line with these efforts to raise the profile of the profession and develop a better understanding of the sector. It seeks to form an objective picture of perceptions on the ground and perhaps even to dispel any preconceptions, so as to offer readers food for thought and suggest possible improvement areas.
INTRODUCTION

Context and objectives

Rope access work developed rapidly as of the mid-1990s. This is illustrated by the turnover increase of close to 20% enjoyed by the sector’s companies between 2000 and 2010, and the threefold growth in turnover between 2009 and 2016. Gathering comprehensive data about the sector’s businesses remains a difficult task, given their diversity (in terms of structure and size) and the pace at which these firms tend to be formed and folded, particularly in the case of micro-enterprises. Trade bodies quote a figure of 700 entities that are regularly involved in rope access work in France, equating to around 8,500 rope access technicians, of which half are temporary workers. The sectors in which they operate include construction and civil engineering in natural, industrial and urban environments, as well as the event and wind energy sectors. While it may be a slight oversimplification, it can be said that rope access technicians essentially require two types of skill: rope skills and construction/civil engineering skills. Rope access work inherently generates certain safety issues, which are the subject of guidelines drawn up by the profession itself (e.g., the rope access technician’s checklist), the trade bodies that oversee certification within the profession (DPMC, GRETA VIVA 5, IRATA), institutions (OPPBTP) and equipment manufacturers (usage and technical recommendations). In terms of risk perception, falls from height appear to be the primary danger. However, other hazards, which are less sudden and have no serious ill effects in the short term, can be harmful for workers and create difficulties for businesses (staff turnover, training time etc.). Indeed, along with its more appealing, spectacular and gratifying aspects, rope access work brings with it a wide range of stresses due not only to the nature of the work and the specific movements it requires, but also to working conditions, the locations in which the work is carried out, the difficulty involved in accessing certain sites and securing them, and the body positions assumed (while suspended in a harness). The situations encountered are conducive to injuries both traumatic (e.g., caused by impacts) and chronic (e.g., musculoskeletal disorders). Current knowledge of the profession’s characteristics seems to indicate, on the one hand, that it takes several years to fully train a rope access technician in the two aforementioned skill sets and, on the other, that their career is estimated to be short. There is an assumption that the shortening of careers is linked to the occurrence of injuries. However, thus far, the aetiology of injuries typically suffered by rope access workers, i.e., their various causes, has rarely been explored in France.

Along with falls from height, which, as mentioned previously, remain the most serious danger to the physical health of rope access workers, hand injuries, lower back strain and eye injuries from flying particles are all well-known hazards in the profession. Rope access technicians are also members of the construction and civil engineering industry, a sector in which musculoskeletal disorders have always been among the main occupational hazards facing workers in traditional roles. Given the position rope access workers assume in their harness and the physical demands of the work itself, it might be presumed that the torso and upper limbs are subjected to stresses relating to body position, the bearing of loads and repeated movements

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1. Micro-enterprises: companies that employ fewer than 10 people.

2. www.sfeth.com

3. The study was carried out in 2016, the report drafted in 2017.
and/or vibrations, which are believed to be factors in the occurrence of chronic injuries. The lack of understanding, in France, of the causes of injuries among rope workers restricts the ability to set out recommendations or risk prevention methods. Due to the absence of any real diagnosis of the situation, it is currently impossible to deploy a specific set of measures comprising a selection of prophylactic practices geared towards preventing pathologies from appearing or spreading.

The aim here is to obtain a snapshot of the reality on the ground based on an epidemiological study. Indeed, the health status of rope access technicians has raised questions among members of the profession and the sector’s various stakeholders, insofar as the job in itself places significant stresses on the body, including all those encountered in the construction and civil engineering industry, as well as those specific to rope access work. These two categories are intertwined to such an extent that it is impossible to isolate them, hence the complexity of the profession, its training programmes, the activities it involves and its careers.

In the light of these observations and given the stakes involved in these issues, a cross-disciplinary research team from Université Lyon 1, supported primarily by the Petzl Foundation, but also by the CRIS research federation, set itself the task of assessing the general state of play by conducting a wide-scale survey of the profession for the purpose of describing the work environment, the injuries suffered by rope access technicians and their interrelations.

The intention is for this study to serve as a starting point for a longer-term research programme aimed at addressing the physical problems experienced by rope access workers.

**Our perspective**

Our research team left all preconceptions and value judgements aside during its examination of the rope access world. It was assembled from individuals with a wide range of complementary skills and based at two laboratories, so as to broach the issues at hand from various angles. The first involved an approach revolving around ergonomics and human/sporting biomechanics. The second examined living conditions and work situations from a sociological perspective. The third focused on accidentology, the relationship individuals have with risk and the prevention of injuries. The team was enlarged during the data gathering phase by bringing in a market researcher with experience of the profession and who was comfortable with the task of speaking to rope access technicians out in the field. This person’s knowledge of the role performed by rope access workers and its specificities was an advantage when data was being collected on the ground and in terms of establishing relations with the profession’s different stakeholders.

The academic team was also supported by partners with expertise in the field (trade union, training organisation and risk prevention body for the profession), while remaining independent.

**Methodology**

**Giving a voice to rope access technicians**

To obtain the most authentic snapshot possible of rope access workers and their state of health, we opted to get as close to these individuals as possible by speaking with them directly. Thus, after an exploratory phase (interviews with those in charge of the sector’s companies, observation of workers on the job), we consulted the partners in the project before opting to gather data by administering the questionnaire directly across the Rhône-Alpes region, which is home to around 20% of France’s population of rope workers.
The questionnaire handed out to rope access technicians was compiled based on previous surveys, the literature on the topic and the recommendations of study partners (training and risk prevention organisations, trade union). It comprises four main sections: a description of a rope access technician’s job tasks and the conditions under which they perform them, their career and its progression, their injuries over the last twelve months and their lifestyle.

The questionnaire was designed so that it could be completed out in the field, in the office, at the end of a day’s work, during a break, etc. In the majority of cases, the market researcher handed out the questionnaire to rope workers and remained on hand to answer any queries that might arise or provide clarifications should there be any doubt as to how to answer a question. The rope access technicians then completed the questionnaire anonymously, so as to preserve the confidentiality of their personal information.

An initial version was first tested out on 15 rope workers, to check its coherence and ensure that the questions and the answers suggested were unambiguous. The trial led to adjustments that allowed a final version to be published. This was presented in the form of an eight-page booklet. It took the rope workers around 15 minutes to complete the questionnaire.

In parallel, a list of the specialist companies involved in the sector was compiled and these organisations were contacted so as to gain access to those targeted by the survey. Given the difficulty involved in accurately determining the number of professionals in the sector (estimated at between 4,500 and 8,500) and the strong ties between the profession and the Rhône-Alpes region (in both historical and quantitative terms), the aim was to work with a sample of 500 rope access technicians, chiefly in Rhône-Alpes, over a period of six months (May to October 2016).

Who answered this questionnaire?

The questionnaire is aimed at all workers at height who have worked as rope access technicians during the 12 months preceding the survey.

After sorting through the questionnaires and excluding those where not all of the 87 questions had been answered, the field survey produced a total of 478 usable questionnaires. It should be pointed out that this thorough gathering of first-hand material is one of the key strengths of this study, adding considerably to its value. We shall now provide a quick description of the sample surveyed, by way of a snapshot of the population.

Rope access technicians: who are they?

A population that is generally young and male

The population we observed and on which we will base our study is mainly comprised of men (just 2% are women) aged 19 to 65, with a relatively low average age of 34. The majority of rope workers who responded to the survey live with a partner (57%), with (44%) or without children, and seem somewhat at odds with Épinal’s image of a nomadic bachelor who lives in mobile accommodation. Indeed, fewer than 5% fit that particular picture. 50% of the rope workers surveyed live less than 50 km from their employer’s head office.
Rope workers need to be qualified

Rope access workers are relatively well qualified in comparison to other professionals in the construction and civil engineering sector. 25% have a BEP or CAP vocational diploma, a third of the population have a baccalaureate (high-school diploma) and a further third have a higher-education qualification.

Rope access technicians are generally athletic

Overall, the build of rope access workers is close to the national average for 18-65 year olds. The average height of rope workers is 1.77 m (± 7 cm) compared to a national average for men of 1.75 m. It is also worth noting that 50% of the individuals in the sample are between 1.73 m and 1.82 m in height. Meanwhile, the average weight of rope access technicians is 73 kg (± 9 kg), whereas the average weight of French men is 77 kg. With a body mass index (BMI) of 23.3 kg/m² (± 2.6), rope workers are below the average for French people aged over 18 (25 kg/m²). They are in the "normal build" range according to the WHO classification, which is that of a relatively athletic body.

While there are usually disparities in terms of build according to socio-professional category and place of residence (INSEE, 2007), the rope worker population does not seem to follow these trends.
The purpose of this section is to present the conditions in which rope access technicians practice their profession today. Since the pioneers of the 1950s (professional mountaineers and potholers), who saw the job as an additional and seasonal source of income, and the developments of the 1970s that centred on the maintenance of large structures (bridges, dams, etc.), loose material removal or the installation of protective nets on cliff faces, various changes have taken place.

A multifaceted profession

The rope access profession is a difficult one to fully grasp, because it can take a variety of forms. It is practised in a vast range of geographical, temporal and environmental conditions. The way in which the job is performed can differ according to each technician’s peculiarities. This is the idea we intend to explore in this section.

Why do people become rope access technicians?

What prompts a rope access technician to enter the profession?

The main motivations of rope access technicians centre on the fact that they work outdoors (91% of workers), perform a job that is unusual (88%), enjoy the physical exercise (81%), and are autonomous and independent (78%). Also cited are the idea of rising to a challenge and surpassing oneself (65%), and the lucrative nature of the profession (59%).
The spectrum of employment contracts

The results of our survey indicate that around 35% of rope access technicians have a permanent employment contract, 8% are on a fixed-term contract, 7% are self-employed and 40% are temporary workers. The remainder might have one of a variety of statuses (from part-time small entrepreneur to trainee). It is important to note that an individual’s employment status can change during the course of the year.

![Fig. 3](image1.png)

Within this system, where the type of contract can change over the course of the year, we noted that 57% of rope workers never take on temporary work.

A business often qualified as lucrative

The annual income of rope access technicians is highly variable, given the seasonal nature of the work and the flexibility, the potentially multiple statuses (permanent, fixed term, temp, self-employed, etc.) and the working rhythms of these individuals (by way of an example, 29% of rope access technicians worked for six months or less over the last 12 months). The most well represented income bracket is €16,000 to €30,000 net per year (56% of the population). And while 27% of the rope worker population receive a net annual income of less than €15,000, 14% enjoy a net income of over €31,000 per annum.

![Fig. 4](image2.png)

As is often the case with income data, prudence should be exercised, notably in view of the varying proportion of the year for which technicians work, which is not expressed here. In addition, depending on the type of work performed, benefits in kind and meal allowances may be taken into account in the net income they declare.
Where do they work?

Rope access technicians perform their role in various different work environments over the course of a year. They are more likely to work in some sectors than others. In the region covered, they are involved mainly in urban operations (34%), followed by civil engineering applications (23%), industry (8%) and, lastly, events (4%). The wind power sector only employs 2% of the rope access technicians surveyed. This figure is liable to differ somewhat in other regions of France (in the north of the country for example). But this does not prevent them from working in other sectors on a regular basis, notably due to the seasonal nature of their profession. It is worth noting that the industrial sector, which provides regular work to 8% of rope workers, might employ double the number during the course of the year.

In total, the urban sector exclusively or frequently employs more than half of the rope access technicians surveyed (57%) to perform a diverse range of activities, which are detailed below.

A varied profession (with a few dominant subtypes)

Only 10% of rope access technicians always perform the same work. This applies to those specialising in construction or in the removal of loose material from cliff faces or buildings. While this type of work is frequently performed by 47% of rope access technicians, they are also often involved in masonry (41%), painting (36%), window cleaning (14%), building cleaning (14%) or net installation (23%). This demonstrates the versatility of these individuals. Some activities are more exclusive: for instance, 95% never hang high-voltage transmission lines, 91% never erect mobile phone masts and 79% never assemble event structures.

They “are not window cleaners, but rope access technicians”*: this phrase sums up the situation fairly accurately, as it highlights both the specificity of rope access work, which is the key element of the profession, and the idea that few rope workers confine themselves to a single role.

The wide variety of tasks they perform requires them to use a diverse range of equipment. Irrespective of the sector of activity, more than 60% of rope access technicians frequently use percussive, cutting or vibrating tools. On top of this, one-quarter of the rope worker population always use small hand tools (screwdrivers, etc.) in conjunction with other tools, depending on the task in question.

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* Joffrey and Raphael, rope access technicians: “We’re often hanging in silly positions”, l’Obs, 31 July 2014.
Worker training

The majority of rope access technicians who are still active today are trained in rope techniques specially developed for the profession (these differ from those used for sporting purposes). There are several parallel qualifications on the market: the level-1 Professional Qualification Certificate for rope access technicians (CQP1), which is held by 44% of technicians, Rope Access Technician Certification (CATC) and CQP2 (22% and 14.5% of technicians, respectively), which serve to recognise the skills required to work autonomously, and higher diplomas such as CQP3 and IRATA or 3, which are held by just 5% of workers, the majority of whom are trainers or site managers. 13% of rope access technicians have no diploma, but this does not preclude them from rope access work.

A profession that requires a wide range of know-how

Because they need to possess twin skill sets, in addition to specific training on rope access techniques most rope access technicians (79%) are also trained in workplace rescue and first-aid techniques, which many companies ask for and, in some cases, require. This has a collective purpose. Indeed, the aim is to acquire...
and master the techniques needed to rescue others in an occupational context, but also to contribute to risk prevention within the company. Of those who have not received such training, half have no rope access qualifications.

30 to 40% of rope access technicians take additional training in areas such as the assembly and use of scaffolding, the use of man lifts and cranes, and electrical accreditation. A significant proportion of rope access technicians are partial to supplementary training, which provides the additional know-how needed to intervene in a variety of complex situations (e.g., electrical or chemical accreditation). 48% of rope access technicians hold between two and four additional qualifications, with some taking more than 11 supplementary training courses, while only 10% have none.

What this tells us is that rope workers are aware of the complex environment in which the members of their profession operate. But it could also indicate that qualifications are a crucial factor when it comes to employability. We are far removed from the pioneers of the trade, who took advantage of their sporting abilities to work as rope access technicians on the side.

The organisation of work lies at the heart of the profession

Material factors (working at height, suspension from ropes, etc.) and technical safety measures (wearing a harness, etc.) alone cannot provide a comprehensive picture of the professional situations encountered. Working conditions, job characteristics and the dynamics of the social relationships that form within the profession comprise a set of factors that have proven links to the wider health of workers. Before we identify these links, we will focus on the ways in which work is organised.

Though their job may be physical and sometimes very demanding, 83% of rope access technicians are generally satisfied with the way in which projects are planned, which has a bearing on their working rhythms and the tasks they must perform. They are even more satisfied with their relationship with colleagues (98.5%). This provides a good insight into the nature of the job, which would be impossible without the support and presence of others. The notions of teamwork and mutual trust between colleagues provide guarantees of safety, success, but also satisfaction. And while rope access technicians tend to seek “autonomy and independence”, more than 93% are satisfied with their supervisor’s management methods.
The vast majority of rope access technicians are satisfied with the way in which their work is planned and with their hierarchical relationships. If we look at their satisfaction regarding pay, 61% are quite satisfied, 30% are not very satisfied and 8% are not at all satisfied with their wages.

**Mobility (travel and accommodation)**

57% of rope access technicians travel less than 50 km per day to their workplace, while a quarter travel between 50 and 100 km to work. The variety of locations in which companies and technicians are based means that the distances travelled within the area are generally limited, even if some projects require individuals to be away for a week at a time. And despite the fact that the survey area displays characteristics that are particular to the Rhône-Alpes region’s geographical context (mountains and valleys that are difficult to reach), work trips and overnight stays away from home are relatively rare. When they do travel, 32% of rope access technicians choose to stay in a hotel, a quarter prefer to rent accommodation in a campsite (mobile home, tent or chalet) and another quarter opt for a campervan. However, it is important to reiterate that this is far from being a regular occurrence for rope workers.

![Fig. 8 / Type of accommodation always / often used during work trips.](image)

**Building a career**

**How do rope access workers see their career progressing?**

Rope access technicians begin their career at an average age of 26.3 (± 5.5), which is higher than the average for the construction and civil engineering sector as a whole (where apprenticeship programmes allow individuals to start relatively young) and is linked to their overall level of education. As a result, they display a degree of maturity with regard to career planning. Two-thirds of rope access workers aspire to progress towards more technical roles or to take on greater responsibilities, but also to vary the types of assignment they take on as part of their job and to maintain a certain level of independence.

**A career plan that is relatively short but which is accepted as such**

While 77% of rope access technicians do not wish to leave the profession, with which, as we have seen, they are generally satisfied, they see their career as being relatively short and plan to leave at an average age of 47.6 (± 10.1)\(^3\). This reinforces the idea that, on the one hand, it is a profession for people who are relatively young and, on the other, they will have to forge a second career before they approach retirement age. Businesses and trade bodies (particularly in the construction and civil engineering sector) consider health issues to be the main obstacle to longer careers. Is this also the case for rope access technicians?
Conducting an epidemiological study of rope access technicians also means identifying their day-to-day living conditions, their pastimes and their consumption habits, which may have a significant impact on their health. The links between diet and health, physical activity and health, not to mention addictions and health, are frequently demonstrated and public awareness campaigns are a regular fixture in the media. The purpose of this section is to describe how rope workers relate to these notions.

**Keeping fit and (excessive) physical exertion**

As anticipated, rope access technicians are generally experienced sports enthusiasts. We have already mentioned that their bodies are relatively athletic. We will now identify the sports in which they partake. 81% regularly take part in sport (more than one hour per week), while just 10% state that they do no sport at all. The proportion who regularly enjoy sport is much higher than average, given that just 46.7% of the French population participate at least once a week.

![Weekly time devoted to sport and physical exercise (outside work).](image)

Thus, in addition to their professional activities, rope access workers devote a fairly substantial proportion of their time to sport and physical exercise. Indeed, in addition to stating that they are regularly involved in such pastimes, 43% of rope access technicians reveal that they practice a sport for more than three hours a week and 37% declare that they regularly take part in at least three different sports. And to complete our picture of their sporting proclivities, 64% of rope access technicians claim to be currently enjoying an intensive sporting career, or to have done so in the past.

What are their preferred sports?

Having grouped the main sporting activities declared by rope access workers into major categories, outdoor activities appear to be the preferred category, which is hardly surprising. 60.5% of rope workers who take part in sports enjoy activities from the outdoor category15. The parallels between these sports and the work performed by rope workers should be underlined, be it in terms of history, culture, technique, know-how or their relationship with the environment and risk. Another category declared by a fairly high proportion of rope access technicians (18%) is that of “keep-fit” activities, which in some respects resemble outdoor sports, but are not as demanding. Only 3% and 4%, respectively, of the individuals surveyed take part in combat sports and team sports.

Although they enjoy various sports on a regular basis, rope access technicians are significantly less inclined to take part in keep-fit or injury-prevention activities for reasons linked to their profession.

Only 17% declare that they often or always warm up before carrying out rope access work. The same goes for stretching before a day’s work, which only 18% take the time to do. 25% of the population of rope access workers use recovery techniques after a day’s work, including stretching.

In other words, more than 80% of rope access technicians choose not to perform warm-up or stretching exercises before starting their day. More than one in two claim never to do so. This disinterest raises certain questions, given their enthusiasm for sport. Is this connected to the idea that they do not need to warm up for their professional work?
That they see a relationship between keeping fit and sport, but not between fitness and their work? That they have not experienced any benefits from doing so? That they believe they can withstand the loads involved because of the sports in which they partake?

Two quite paradoxical observations emerge from this data on the sporting proclivities of rope workers and the stresses on their bodies. On the one hand, the majority of rope access technicians take care of their physical health through sports. On the other, they have little regard for their body when using it as a work tool.

Do they cut themselves enough slack?

Setting aside the glibness of the question, it is quite natural to question the state of health of these highly active workers.

80% of rope access technicians declare that they are often or always tired in the evening. Travelling, setting up their work site and performing the actual rope access work, not to mention participation in sport in some cases, all add up to busy days. But 43% are always or often tired in the morning, without this being due to poor sleep or carrying excess weight (which can be synonymous with exhaustion). As well as being tired, rope access technicians tend to have a lifestyle that truly puts their health to the test.

Diet

Given their workload, rope access technicians typically expend a great deal of energy. In this respect, these individuals take particular care of themselves. In terms of the quality of their diet, 75% of rope workers agree completely or agree somewhat when it is put to them that they have a balanced diet. Similarly, 70% rarely or never try to save time on an assignment by skipping their lunch break, and two-thirds of technicians devote an average of 15-30 minutes to meal preparation.

Alcohol

7% of rope access technicians declare that they have not consumed alcohol in the last 12 months, which is a little less than the national average of 13%. Of those rope workers who do drink alcohol, 39% do so regularly and 15% on a daily basis. The proportion of men aged over 18 from the general population who consume alcohol every day is also 15%. While abstinence among rope access technicians is lower than the national average, the proportion who consume alcohol on a daily basis is the same as that of male adults in France as a whole.

Tobacco

The regular health survey that has been conducted by France’s National Institute for Prevention and Health Education (INPES) since the 1990s shows that smoking figures have remained relatively stable among the French population since 2010. In 2014, 20.2% of the French population aged over 15 declared that they had never smoked. The proportion of rope workers who do not smoke is much higher, at 37% (although the age range is narrower: 19 to 65). A more detailed analysis shows that 32.3% of French men smoke regularly, while this is the case for 57% of the rope access technicians surveyed. To sum up, these technicians have a more polarized relationship with tobacco than the French as whole: they either do not smoke or are regular smokers. A fairly strong link has been demonstrated between working
in construction and civil engineering and smoking on a regular basis, leading to a higher than average risk of experiencing pathologies\textsuperscript{18}. Moreover, individuals who work under certain physical conditions (e.g., heavy loads, noise, cold, heat, humidity, dirt) are more likely to be regular smokers\textsuperscript{20}.

**Soft drugs**

As regards the consumption of so-called soft drugs, it has been shown that this is a generational phenomenon that is particularly prevalent among young men. Rope access technicians are no exception to the rule: while 57% declare that they never use soft drugs, 42% do consume these substances, which is significantly higher than the 15% of French men aged 18 to 64 who say they have done so in the last 12 months\textsuperscript{21}. When it comes to regular use, i.e., at least 10 times in the last 30 days, the figure falls to just 3% of the French population aged over 18 and down to 18% in the case of rope access technicians.

This data should be treated with caution, since the topic is far from taboo in the rope access profession, but might be subject to underestimation in the surveys conducted by the INPES and the French Observatory for Drugs and Addiction.

Is this consumption due to the challenges faced, a carefree attitude or specific difficulties?

**What should we take away from this?**

Rope access technicians seem to live life “to the full”, in terms of their sporting activities and lifestyle alike. This observation can be put into perspective by the fact that 65% seek a challenge and to push their limits when they go to work.
This section summarizes the descriptive elements of the injury profiles of the rope workers surveyed. Once we have defined what we identified as being an injury for the purposes of this study, we will focus on injury frequency and severity, the location of injuries, the conditions under which they were sustained and whether or not the injury occurred in a professional context.

How does this study define injury?

An injury was defined as: “any physical complaint or manifestation sustained by the rope access technician over the 12 months preceding their completion of the questionnaire, regardless of the need for medical treatment or to take leave from work”\textsuperscript{22}. Based on this definition, 318 injuries were declared by 193 respondents, i.e., 40\% of the population surveyed. However, a qualitative analysis of these 318 injuries highlighted that some had occurred prior to the period in question (the previous 12 months) and no longer affected their work. Consequently, a filter was applied so as to only take into account those injuries that had occurred over the previous 12 months and those that still caused the rope worker discomfort. This selection rule allowed memorisation bias to be minimised\textsuperscript{23}. Thus, 304 injuries declared by 186 individuals, or 38.5\% of the initial population, were considered in establishing a typology of the injuries suffered by rope access workers.


\textsuperscript{23} A person’s memory selects information about an injury event that can distort the facts surrounding its occurrence. For instance, one individual may accurately recall an old injury event, while another may minimise such an event, either consciously or unconsciously.
Single or multiple injuries?

21.5% of the rope access workers in our sample, i.e., 103 people, declared a single injury, 10.7% declared two, 6% three and 0.6% four. What this tells us is that, of the rope workers who have suffered injuries, 45% have sustained more than one.

![Fig.11 / Breakdown of the number of injuries that occurred in the last 12 months or that still cause the rope worker discomfort.](image)

In addition, the degree of pain resulting from the injuries declared was rated on a scale of 1 to 10 (where 1 represents very slight pain and 10 unbearable pain). The very small proportion (6%) of injuries where the pain score is 2 or less demonstrates, on the one hand, that the injuries declared by rope access technicians are more than just scratches and bruises and, on the other, that the injuries suffered are both noteworthy and painful: 53% of injuries have a pain score of more than 5.

Main injury locations

Our results confirm the existence of risks that the rope access profession has already identified closely. Hand injuries account for 12% and lumbago 18% of the total. Eye injuries account for the majority of head injuries, but for only 2% of all the injuries declared. The results of this survey also show that shoulders (14.5%, or 18.5% including injuries to the cervical area) and knees (8.2%) are parts of the anatomy that are particularly prone to injury among these workers (Figure 12).

If we make a comparison with the 2013 statistics of France’s national insurance fund for occupational risks, proportionally fewer rope access technicians seem to sustain upper limb injuries (47%) than construction and civil engineering workers (72.6%). However, a similar proportion of rope workers suffer from shoulder complaints (25% and 28.6%, respectively), a smaller proportion experience elbow issues (12% and 17%, respectively) and a higher proportion encounter wrist/hand problems (34% and 27%, respectively). When it comes to the lower limbs and torso, rope access workers appear to be more vulnerable than construction and civil engineering workers (19% vs. 5.1% and 29% vs. 12.6%, respectively). However, these comparisons must be wielded with a great deal of caution. Indeed, our definition of an injury differs from the official definition of an occupational illness. With regard to the torso, in particular, our categorisation includes injuries to the sternum and rib cage, which may explain why the injury rate is twice as high as for construction and civil engineering workers.

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25. www.inrs.fr/actualites/statistiques-BTP-2014.html [consulted on 08/02/2017]

26. In France, an illness is considered occupational when it is the direct consequence of a worker’s exposure to a physical, chemical or biological hazard, or stems from the conditions under which they perform their job and is included in one of the tables published by the country’s department of social security. (source: www.inrs.mp.fr/mp/cgi-bin/mppage.pl?)
Injury typology

Traumatic injuries, i.e., those that occur suddenly, account for a little over half of all the injuries declared (57%), while slightly less than half are chronic injuries, i.e., complaints that emerge gradually. Of these chronic injuries, 28% were already present prior to the survey period.

More specifically, the majority of the injuries declared affect the joints / ligaments (35%) and the muscles / tendons (34%). Each of the remaining types of injury declared account for only a very small proportion of the total (Figure 13).
Context of injury occurrence

The injuries sustained by rope access technicians occur primarily in a professional context (89%). It is important to note that none of the 304 injuries declared are due to falls from height. A closer analysis of the professional context indicates that 13% of injuries occur at the beginning of the day (journey to the site, unloading, access, workstation set-up), 62% while performing the work (when suspended, when working at height or on the ground, and when moving the workstation), and 4% at the end of the day (taking down the workstation, loading the vehicle and the return journey). The remaining 10% are not specifically related to a particular moment in the day, but more to a context of over-exertion (or “fatigue”).

Leisure activities or sports account for 6% of the injuries declared. In 2% of cases the individuals are unable to specify a particular context and the remaining 3% occur under other circumstances (e.g., domestic accidents).

Presence of tools or environmental factors when an injury occurs

Half of the injuries declared were not related specifically to the use of a particular tool or any environmental factors. The remainder were linked primarily to the use of percussive tools (19%), cutting tools (5%), masonry tools (4%) and vibrating tools (2%), as well as collisions with the environment (13%), ropes (3%) and PPE (2%).

Just to give some perspective, hand tools are linked to just 8.6% of the occupational illnesses suffered by construction and civil engineering workers.\(^\text{27}\)

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\(^{27}\) [www.inrs.fr/actualites/statistiques-BTP-2014.html](http://www.inrs.fr/actualites/statistiques-BTP-2014.html) (consulted on 08/02/2017)
Injury severity and treatment

Although painful, the injuries declared led to sick leave in only 49% of cases. The average duration of sick leave is 72 days (±179), with 25% of injuries leading to 8 days’ sick leave or less, 25% between 8 and 21 days, 25% between 21 and 86 days, and 25% more than 86 days. 79% of these injuries still cause the rope workers discomfort. More specifically, 12% of rope access technicians always experience discomfort, 32% often and 35% rarely. Only 21% of injuries led to rope workers feeling no after-effects at the time of the survey. (Figure 16)

The injuries are generally treated conservatively (40% of injuries require medication, 40% physiotherapy intervention, and 42% osteopathy). Surgery was performed to treat 12% of the injuries declared.

46.4% of rope access technicians altered their working approach after their injury, which suggests that they either became more aware of the mechanisms that led to it, or have suffered loss of functional capacity. However, the factors behind this alteration could not be accurately pinpointed by the questions asked when the data was collected, as only 11.2% of injuries are linked to a change of equipment, 5.6% to the adjustment of working hours and 4.3% to a change in workstation layout.
Is the location of an injury related to its other characteristics?

In order to study these relationships, the locations of the injuries declared were grouped into four anatomical categories: lower limbs (feet, ankles, calves, knees, thighs and hips), torso (lower back/pelvis/coccyx, abdomen, sternum/ribs/upper back and neck/cervical rachis), upper limbs (hands, wrists, forearms, elbows, arms and shoulders) and head. The other characteristics relate to the nature, the professional, environmental and material contexts, and the severity and treatment of the injuries. Studying the anatomical location and other characteristics of injuries in combination makes it easier to identify the circumstances surrounding the injuries suffered by rope access technicians.

Injuries to the lower limbs

Injuries to the lower limbs usually affect the joints or ligaments and tend to occur suddenly. 66% of these injuries are not clearly linked to a specific professional context. In 22% of cases, the injury was caused by a collision with the environment. Moreover, injuries to the lower limbs are less likely to lead to long-term discomfort than those to other body parts.

Injuries to the upper limbs

Injuries to the upper limbs tend to affect the muscles and tendons and usually occur gradually in a work context that involves suspension, either due to the ropes themselves, or as a result of using percussive or cutting tools. It should be noted that it is less common for these injuries to necessitate sick leave than injuries in other anatomical locations.

Injuries to the torso

Injuries to the torso tend to affect the nerves (e.g., sciatica) and rope access technicians do not associate them with a specific professional context. These injuries are characterised by a certain degree of recurrence and by lingering discomfort. They are also more likely to lead to sick leave being taken and to the use of medication than injuries to other areas of the body. Similarly, rope workers have a greater tendency to see a physiotherapist or osteopath when they have sustained a torso injury.

Head injuries

Head injuries primarily affect the skin (e.g., burns) or eyes. They tend to occur suddenly as a result of a collision with the environment. These injuries are more likely to require surgery but do not generally produce after-effects that hinder the ability to work.
The purpose of this section is to study the relationships that exist between the status of rope access technicians in terms of their injury history and their demographic, professional, sporting and lifestyle descriptors. While the retrospective nature of this survey does not make it possible to identify causal links between the occurrence of an injury and the rope worker’s other descriptors, it is possible to compare the characteristics of rope workers who have an injury history against those of technicians who do not, so as to begin to build up a picture of a rope access worker who is particularly prone to injury.

Among the rope access technicians who responded to the survey, two groups were identified: the first comprises 285 rope workers who declared that they had no injury history, while the second contains 186 rope workers who declared at least one previous injury.

Regarding their other characteristics (socio-demographic, sectors of operation, workloads, etc.), there were initially four possible answers to the majority of the questions asked (Always, Often, Rarely, Never). For this analysis, these four answers were then reduced down to two levels: regularly, which includes the answers Always and Often, and occasionally, which includes Rarely and Never. Thus, a link was

29. In this case, a retrospective study means that exposure is measured after the injury occurred.
established between the group to which the individuals belong (injury history and no injury history) and each two-level characteristic. In addition, relative risk, i.e., the number of individuals whose status was injured with respect to the number of individuals whose status was uninjured for a given characteristic, was also defined.

To interpret the results, we assumed that certain socio-demographic, professional and lifestyle characteristics declared by the rope workers when answering the questionnaire were similar to the characteristics that defined them at the time of the injury. This assumption allows certain hypotheses to be put forward regarding the factors that contribute to injuries among rope workers.

Although the causal links can be complex, the probability of injury tends to be increased by a combination of factors. We will illustrate this point in the first part of the analysis. As regards the other relationships studied, a link can be established but the meaning behind the effects remains undefined. In other words, it is not always possible, at this stage of the study, to determine whether a given factor increases the risk of having been injured, or if it is the consequence of a previous injury.

**Socio-demographic factors**

There seems to be no link between demographic descriptors and injury history, whether it be in terms of age, build, level of education or marital status. This can be explained by the socio-demographic homogeneity of our sample: this is a relatively young and athletic population. Despite this uniformity, there is nevertheless a link between the type of main residence and injury status. Rope workers who live in mobile accommodation are 1.7 times more likely to have injured status than those with a fixed residence. However, the fact that the proportion of rope access technicians who live in mobile accommodation is so small (5.6%) requires this link to be confirmed before it is possible to generalise.

**Professional factors**

Motivations

The factors that motivated the respondents to join the rope access profession are clearly rooted in their experiences as active individuals. The rope skills and physical exertion involved, the appeal of working outdoors, the unusual nature of the job and the fact that it sets a challenge that allows them to push their limits are major draws for rope workers with and without an injury history. Similarly, the majority declare that they had practised sport intensively before entering the rope access profession. However, rope workers for whom these factors were less of a motivation and with less of sporting history are 1.6 to 2.9 times less likely to have injured status.
WORKING OUTDOORS AS A MOTIVATION TO ENTER THE PROFESSION

Working conditions

In general, when working conditions are deemed to be good, this improves job satisfaction, motivation and employee loyalty, whereas when working conditions are deemed to be poor this causes physical and psychological stress that may favour the appearance of occupational illnesses. Is this also the case for rope access technicians?

The fact of having injured status does not seem to be linked to the context in which rope workers perform their role. However, the length of time for which they are exposed to the risks inherent to the job does have an influence. Indeed, there is no relationship between injury status and the type of work contract in place, be it permanent, fixed term or temporary. However, working as a rope access technician for more than six months in the past year doubles the risk of having injured status compared to working for a total of less than six months. These results confirm that the presence of an injury history is linked to the duration of exposure.

The way in which work sites are planned and the relationships established with superiors and colleagues, which are generally perceived as satisfactory by rope access technicians, have no particular link to injury status.

The satisfaction of rope workers when it comes to their remuneration is fairly mixed (61% are quite to very satisfied, 38% are not very or not at all satisfied). If we examine this parameter with respect to injury history, it transpires that rope access technicians who are not very or not at all satisfied with their income are 12% more likely to have injured status than those who are quite to very satisfied with their income.
Furthermore, the proportion of rope workers with an injury history who travel an average distance of more than 100 km between the home and the work site is 9% higher than that of rope workers who travel less than 100 km.

When they are required to travel to remote work sites, rope access technicians often need to stay in nearby accommodation. Rope workers who prefer to stay in hotels, bed & breakfasts or apartments are no more likely to have injured status than those who choose other types of accommodation. However, those who regularly opt to stay in a campervan when the work site is far from their home are 1.6 times more likely to have injured status than those who choose other types of accommodation. Similarly, those who regularly choose to stay in a campsite are 1.9 times more likely to have injured status than those who choose roofed accommodation.

Whether mobile accommodation is used on an occasional basis during work trips or as a full-time residence, there is a link between staying in mobile accommodation and an increased risk of injury.

Generally speaking, recent developments in working conditions are geared towards reducing the amount of time workers must spend performing the most physically arduous and repetitive tasks. However, the work performed by rope workers is, by its very nature, physically demanding and/or repetitive. Working in certain sectors increases the likelihood of an individual having injured status. Rope access technicians who work regularly or even exclusively in the civil engineering sector are 2.1 times more likely to have injured status than those who do so only occasionally. Conversely, those who spend the majority of their time working in the urban sector are 1.8 times less likely to have injured status than those who work in
the sector on an occasional basis. Few rope workers declare that they regularly work in the industrial or event sectors. No link can be established between these sectors and the probability of having an injury history.

**WORKING IN THE CIVIL ENGINEERING SECTOR**

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Fig. 22 / Proportion of rope access technicians with (orange) and without (blue) an injury history as a function of the frequency with which they work in the civil engineering sector.

**WORKING IN THE URBAN SECTOR**

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Fig. 23 / Proportion of rope access technicians with (orange) and without (blue) an injury history as a function of the frequency with which they work in the urban sector.
Specific tasks

Each of the sectors in which rope workers operate requires certain specific tasks to be carried out, which place repeated stresses on their bodies. It would appear that the number of specific tasks performed in the civil engineering sector is much smaller than in the urban sector. Indeed, of the 12 tasks listed in our questionnaire, workers in the civil engineering sector tend to declare just two. Individuals who regularly remove loose material from cliff faces/buildings and install nets on cliff faces are 1.5 and 2.2 times more likely, respectively, to have injured status than those who do so only occasionally.

![LOOSE MATERIAL REMOVAL FROM CLIFF FACES/BUILDINGS](image1)

Fig. 24 / Proportion of rope access technicians with (orange) and without (blue) an injury history as a function of the frequency with which they carry out loose-material removal.

![NET INSTALLATION ON CLIFF FACES](image2)

Fig. 25 / Proportion of rope access technicians with (orange) and without (blue) an injury history as a function of the frequency with which they install nets on cliff faces.

![USE OF HEAVY TOOLS](image3)

Fig. 26 / Proportion of rope access technicians with (orange) and without (blue) an injury history as a function of the frequency with which they use heavy tools.
The tasks required of rope access technicians in the civil engineering sector regularly necessitate the use of heavy, percussive, high-pressure or vibrating tools. The proportion of rope access technicians with an injury history is 7.5% higher than that of rope workers without when vibrating and high-pressure tools are used on a regular basis, and 18% higher in the case of heavy tools. Thus, those who regularly use heavy tools are **2.1 times more likely to have injured status** than those who do so only occasionally.

In the **urban sector**, the majority of rope access work falls into six main categories: window cleaning, the cleaning of civil engineering structures / buildings, masonry, painting, metal roofing / gutter work and iron / metal work. None of these trades have any particular link to injury status. In the majority of cases, performing these types of work in the urban sector appears to require the use of window cleaning equipment, small tools and extension accessories. There is no particular relationship between such tools and injury status.

It would seem, therefore, that the number of specific tasks performed in the civil engineering sector is much smaller than in the urban sector and that civil engineering work also exerts more stress on the bodies of rope access technicians, particularly due to the additional weight of the tools used. These results suggest that those involved in more repetitive tasks are more likely to have an injury history than those whose job is more diversified.

**Tiredness**

In all sectors, the rope access profession is acknowledged to be punishing, which manifests itself in our results as a frequent feeling of tiredness in the evening (80% of rope workers), a frequent feeling of tiredness in the morning (43%) and sleep disorders (20%). There is a link between this feeling of tiredness and injury history. Rope workers who regularly feel tired in the evening are **twice as likely to have injured status** than those who only do so occasionally. The proportion of rope access technicians with an injury history who regularly feel tired in the morning is 7% higher than the proportion who only do so occasionally. Similarly, rope access workers who declare that they regularly have trouble sleeping are **1.8 times more likely to have injured status** than those who only do so occasionally. And yet, the majority of rope workers do not appear to view these indicators of tiredness as a reason to engage in recovery or preventive activities, because, as stated earlier, very few of them take the time to warm up or stretch before commencing work and not many more stretch after a day’s work.

![A FEELING OF TIREDNESS AT THE END OF THE DAY](image)

**Fig. 27** / Proportion of rope access technicians with (orange) and without (blue) an injury history as a function of the frequency with which they feel tired in the evening.
Career progression

When it comes to career progression, the majority of rope access technicians aspire to greater stability, independence, technical skills and responsibility, regardless of their injury history. However, 11% fewer rope workers with an injury history aspire to greater stability in their future career than rope workers without an injury history. This difference can be explained by the fact that they do not see a future for themselves in the profession or, in other words, that they consider their rope access career to be a temporary one. Indeed, rope access technicians with an injury history plan to halt their career at an average age of 46, compared with 49 in the case of individuals with no injury history. This is backed by the observation that rope workers who plan to leave the profession are **2.2 times more likely to have injured status** than those who do not.

Lifestyle influences

**Sporting activities**

As mentioned previously, great demands are placed on the bodies of rope access technicians due to the very nature of the tasks performed as part of their job, all while suspended in mid-air, but also because of the sports they practise on a regular basis. Rope workers who do not take part in sport are less likely to have an injury history. However, among those who do, the time spent practising sport each week has no influence on the likelihood of having injured status.
Consumption

Rope workers seem to take good care of their bodies by engaging in sporting activities and paying particular attention to their diet. However, a non-negligible proportion of rope access technicians also consume tobacco, alcohol or soft drugs, which are widely known to have a generally negative impact on health. Rope access technicians who drink alcohol appear to be more likely to have an injury history than those who do not. Conversely, the proportion of rope workers with an injury history is lower among those who consume no alcohol at all. The same is true for tobacco. However, these relationships only suggest the existence of a trend, unlike the link between injury history and the use of soft drugs. Indeed, a rope worker who consumes soft drugs is twice as likely to have injured status than one who refrains from doing so.

Fig. 30 / Proportion of rope access technicians with (orange) and without (blue) an injury history as a function of the frequency with which they consume soft drugs.
Is there a link to material factors?

When working with ropes, rope access technicians don their personal protective equipment and use accessories such as seats. For various reasons, a rope worker may choose to customise their equipment and accessories. Of the five reasons to modify equipment suggested in our questionnaire, four have a link to injury status. Indeed, rope access technicians who have modified their equipment according to their size are **1.8 times more likely to have injured status** than those who use their equipment as is. This type of modification is more common among individuals of a smaller size.

**MODIFICATION OF EQUIPMENT ACCORDING TO SIZE**

The likelihood is **1.5 times higher** in the case of modifications made to improve comfort, 2.4 times higher when the modifications are geared towards making the equipment lighter, and 1.8 times higher when the modifications are intended to allow heavier loads to be carried. The risks faced by rope workers who modify their equipment to optimise its use is similar to those faced by individuals who did not perform such modifications.

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**MODIFICATION OF EQUIPMENT TO IMPROVE COMFORT**

**MODIFICATION OF EQUIPMENT TO MAKE IT LIGHTER**

**Fig. 31** / Proportion of rope access technicians with (orange) and without (blue) an injury history as a function of whether or not they modify their equipment according to their size, beyond the standard adjustments the equipment allows for.

**Fig. 32** / Proportion of rope access technicians with (orange) and without (blue) an injury history as a function of whether or not they modify their equipment for greater comfort.

**Fig. 33** / Proportion of rope access technicians with (orange) and without (blue) an injury history as a function of whether or not they modify their equipment to make it lighter.
It is important to bear in mind that our line of questioning does not enable us to ascertain whether these modifications were made before or after the injury occurred. It is therefore impossible to determine whether such modifications are a factor that contributes to injuries or a form of response to injuries sustained previously. However, the links observed between injury status and equipment modification would suggest that particular attention must be paid to the changes made to equipment.

**Typical profile of injured rope access technicians**

We have now established a link between injury history and certain characteristics of rope access technicians, as recorded by our questionnaire. However, these links have been established independently for each of these characteristics, which does not allow us to identify a combination of characteristics that is linked to injury history. An additional analysis made it possible to establish the typical profile of a rope access technician who has sustained at least one injury. All other characteristics being equal, the combination of a work site far from home, net installation on cliff faces, soft-drug consumption and evening tiredness increases the risk of sustaining an injury. Indeed, checking this profile against the initial database led to the discovery that rope access technicians who work more than 100 km from their company’s head office, regularly install nets on cliff faces, consume soft drugs and regularly feel tired in the evening have all sustained at least one injury. Meanwhile, just a quarter of rope access technicians who work less than 100 km from their company’s head office, only occasionally install nets on cliff faces, never consume soft drugs and only occasionally feel tired in the evening have previously sustained an injury.
CONCLUSIONS AND OUTLOOK

478 people answered our questionnaire, which was designed to gain an insight into the conditions under which rope access technicians perform their role, the lifestyle of these professionals and their injury history. The results show that in 2016 the majority of rope workers were male, relatively young and of athletic build. This athleticism appears to be linked to the working practices and sporting proclivities declared.

As regards injuries, while the back and hands are renowned injury locations, the shoulders of rope workers also seem to be a vulnerable area. However, the specific context in which injuries to the shoulders and the pectoral girdle occur remains to be properly identified and requires further investigation, notably by quantifying the mechanical stresses to which the body is subjected during rope access work and by observing usage habits and work situations from an ergonomic perspective. Such an assessment would contribute to more effective risk prevention.

The rope access profession requires considerable physical and mental exertion over the course of a day’s work, which very often leads to a feeling of tiredness. Although the causes of tiredness among rope workers could be assessed with greater precision, it is widely acknowledged as being one of the factors that favour the appearance of injuries. It would therefore be advisable for the profession to raise greater awareness among its members of the need to preserve their physical health. Several possibilities could also be explored to limit the impact of workloads.

Over the course of the day, the stresses technicians undergo could be reduced by alternating work and rest periods in a more optimal way. At the same time, recovery measures could be implemented, such as the ingestion of hydration supplements (such as isotonic drinks), so as to maintain the ionic balances the human body needs to function correctly.

After a day’s work, a variety of actions could be performed immediately after coming down from the ropes to reduce the effects of tiredness. Indeed, physical and mental relaxation exercises (e.g., passive stretching combined with breathing exercises) could be added to the end-of-day procedure. In addition, self-massaging techniques could be performed during the journey home.

In terms of work site planning, the diversification of the tasks performed and the tools used would prevent the accumulation of targeted and repeated stress on a specific part of the rope worker’s body. This hints at the need for individuals to acquire a wider range of professional skills.

It also appears that the equipment used by rope access technicians is suboptimal in terms of meeting their individual needs or catering for the tasks performed. However, because this was not our initial objective, our research did not allow us to pinpoint what is lacking in this respect. Further studies will be required in the future to understand the mechanisms that prompt a rope worker to modify their personal protective equipment and accessories, as well as the effects of these modifications on the mechanical stresses they undergo. Taking into account the way in which rope workers use their equipment could lead to the co-construction of innovations that would make it more suited to its intended purposes.

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30. This comprises the bones (shoulder blades, collar bones and sternum) and muscles that connect the upper limbs to the spine.

31. A drink that has the same composition as blood plasma, thus enabling more efficient absorption of its various components (vitamins, minerals, glucose, etc.), better intestinal assimilation and faster hydration than pure water. Such products should not be confused with energy drinks, which workers would be advised against using for this purpose.
Moreover, at the risk of oversimplifying, rope access technicians appear to be oblivious to half-measures: their lifestyle seems either geared towards sustainability (e.g., no addictive behaviours and a healthy diet) or guided by a diehard attitude. It would be useful to more closely examine the way in which rope workers perceive their work and their physical health so as to prevent excessive exertion. In parallel, encouraging rope access technicians to lead a healthier lifestyle by cutting down on addictive behaviours and seeking a certain degree of comfort, particularly when it comes to overnight accommodation, is another potential action area.

Such measures, the aim of which would be to preserve the physical integrity of rope workers, particularly by reducing occupational fatigue, would centre around raising awareness and contributing to the sustainable economic development of the profession (less turnover, less sick leave, easier career changes, etc.).

This research highlights four areas to be examined to help preserve the physical health of rope access technicians. Diversifying the rope access work performed by individuals and optimising the management of physical and mental recovery are ideas that could be implemented by members of the profession today, so as to limit occupational fatigue. In the longer term, additional studies geared towards understanding both the mechanisms that favour pathologies of the pectoral girdle and the processes applied in modifying equipment and accessories will be necessary to complete the picture and the recommendations to be put forward.
Bibliography


APPENDIX

The questionnaire handed out to rope access technicians can be consulted at www.fondation-petzl.org / “Accident prevention” section.
The Petzl Foundation

Our support for this research project cements our desire to be of service to the rope access community. We are convinced that risk prevention messages, training content and equipment can be improved based on a better understanding of the conditions in which these professionals operate and greater knowledge of the various forms of injury that affect rope workers.

Since 2006, the Petzl Foundation has backed various projects led by non-profit organisations, so as to:

- Encourage individuals to learn about risk management and accident prevention.
- Favour the preservation of ecosystems that are difficult to access.
- Contribute to improving knowledge of the vertical world.

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Epidemiological study of injuries among French rope access technicians
An analysis of working conditions and injury typology

Abstract

In a context where the rope access profession is evolving, training is continuously improving and ever more risk prevention measures are being implemented, it seemed important to contribute to a better understanding of rope access technicians.

The purpose of this study is to determine the epidemiology of the pathologies suffered by rope access technicians based on the results of a wide-scale survey of the profession. Drawing from original data gathered from 478 rope workers, a snapshot of the population is presented using information about their socio-demographic characteristics, working conditions, lifestyle and injury history. The study has allowed perceptions out in the field to be objectivised and quantified, and more sophisticated knowledge of the epidemiology of injuries sustained by rope workers to be developed, thus highlighting the lines of thought that institutional and professional stakeholders should pursue in order to help protect the health of rope access technicians.

Two of the laboratories of Université Lyon 1 contributed to this cross-disciplinary approach, led by:
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and with the support of