

Purpose

Detail the definitions and criteria for classifying and accounting for events related to health and safety at Vale and define the medical procedures to be practiced by health teams, in the analysis process, according to the actual severity of the injury and based on guidelines from the medical literature most accepted available.

Assumptions

- This annex is divided into two complementary chapters, which are arranged as follows:
 - Chapter 1 – the Guide for Classifying and Accounting for Occupational Health and Safety Events (SSO) establishes the requirements and procedures aimed at classifying and accounting for occupational health and safety events.
 - Chapter 2 – Guide to Medical Conduct for Classifying Injuries and Illnesses.
- The guidelines defined in this guide may sometimes differ from those provided for in the local legislation of the units. Therefore, all areas must carry out and maintain records in accordance with Vale's guidelines and, in parallel, with their local legislation, so that both are met.

CHAPTER 1: Guide for Classifying and Accounting for SSO Events

1.1 Actual and Potential Severity

For the purposes of classifying the real severity and fatality potential of OHS events, the definitions established in NOR-0003-G will be applied.

1.2 Classification of High Safety Potential for Fatalities

The assumptions below were defined, aligned with the company's fatality prevention strategy, and should be used to standardize the classification criteria for high safety potential to be used by operations.

It should not consider the performance of controls that act only to mitigate the consequences after the event occurs or administrative controls and/or Personal Protective Equipment, that is, controls that depend on human action (behavior) to be effective.

Must consider the maximum consequence (fatality), among the most likely, that could be generated by the analyzed event, in slightly different circumstances in terms of time, position, and interaction between person, equipment and environment.

Must consider the history of fatal events in similar scenarios at Vale, as well as unprecedented events in the company.

In addition to the potential for a critical impact due to the original mechanism of the event, real impacts (injury) or possible worsening thereof must be considered with the participation of Vale's Occupational Physician.

More significant cases, mapped through the history of high potential events that occurred at Vale in recent years, **should** characterize the high security potential. Here are some examples, but not exhaustive:

EVENTOS x RAC
More significant cases, mapped through the history of high-potential events that have occurred at Vale in recent years, should characterize the high potential for safety. Here are some non-exhaustive examples:
Premises - High Fatality Potential
Electricity Events (Electric Shock):
Exposure to electric arc (CAR 10);
Exposure to energized surface (CAR 10).
Events involving falls from more than 1.80 meters:
Falls and/or near falls of people carrying out activities at a height equal to or greater than 1.80 meters (CAR 01).
Events involving traffic accidents (regardless of speed) were conservatively considered to pose a fatality risk due to large situational variances;
Collision with projection of person not wearing a seat belt (CAR 02);
Vehicle tipping/overturning (CAR 02);
Vehicle collision due to drowsiness/fatigue (CAR 02);
Vehicle collision with large mobile equipment (CAR 02).
Events involving risk of being run over/collision with trains/locomotives;
Vehicle hit by train at level crossing (CAR 02);
Truck hit by train at level crossing (CAR 03).
Events involving the projection of parts, collapse/movement/collision of structures or devices or equipment with the risk of hitting people's heads/chests/abdomens:
Collapse or overturning of aerial work platform or hoisting equipment for lifting people during working at height (CAR 01);
Person hit by equipment and/or its implements (CAR 03);
Improper or involuntary movement of lifting equipment (CAR 05);
Collision between load lifting equipment and/or equipment(s) with structure(s); (CAR 05);
Fall of mechanical components of machines or equipment (CAR 07).
Events involving collision/overturn/collapse of mobile equipment and off-road trucks:
Overturning/tipping over of mobile equipment (CAR 03);
Collision between off-road trucks and other mobile equipment (CAR 03);
Tire explosion of off-road trucks or large wheel loaders (CAR 03).
Events involving crushing of people (head or chest or abdomen or hand or lower or upper limb or rupture of femoral vein):
Falling or tipping of suspended load (CAR 05);
Tipping or falling of lifting equipment (CAR 05);
Moving suspended loads with people in the line of fire (CAR 05);
Failure or absence of protections on machines that may generate projections of materials and/or contact with moving parts (CAR 07);
Running over people at any speed (CAR 02 and 03).
Events involving explosives (CAR 09):
Exposure to events arising from the activity of storage, handling and transportation of explosives (CAR 09);
Uncontrolled energy release (examples: ultra-rock throwing, excessive vibration, overpressure, accidental explosive triggering) (CAR 09);
Occurrence of unknown live mine (CAR 09);
Presence of a person within the area fence, during the activation of rock removal (CAR 09);
Interaction between automotive equipment and impact-sensitive explosives (examples: digging on a loaded bench, encountering misfire during drilling) (CAR 09);
Incidence of atmospheric discharge in a loaded area without isolation of a potential rock projection area (CAR 09).
Events involving risks of second/third degree burns and inhalation of smoke/toxic/asphyxiating gases:
Fires in mobile equipment (CAR 03);
Presence of toxic dust and gases in the atmosphere without the use of PPE or EPC (CAR 06);
Absent and/or ineffective ventilation or exhaust (as applicable in the risk analysis) (CAR 06);
Exposure to places classified as confined spaces without the proper controls (CAR 06);
Excess or lack of oxygen in the environment (CAR 06);
Occurrence of engulfment or drowning in any volume and quantity (CAR 06);
Exposure to electric arc (CAR 10);
Events where contact with metal or liquid slag occurred or could occur (CAR 11);
Event where there was or could be contact of liquid metal or slag at high temperature with water or humidity (CAR 11);
Fire or explosion (CAR 12);
Loss of containment of flammable or combustible fluids during opening of lines or equipment with exposure to the ignition source (CAR 13);
Contact with corrosive substances or high or low temperature, pressure during opening of lines and/or equipment (CAR 13);
Explosion due to incorrect release of lines or equipment containing flammable liquids or gases and grounding failure or presence of ignition source (CAR 13);
Projection of dangerous fluid, under pressure, due to failure in the release of lines or equipment (CAR 13).
Events involving geotechnical activities on slopes, with risk of displacement/collapse/burial:
Absence and/or failure in the anchoring system, screens, support system or reinforcement in planned locations (CAR 08);
Unwanted mass movement that may affect people, such as: displacement of wall material, gallery ceiling, excavation above 1.25 m and slope in non-isolated area, rolling/falling of block without the appropriate containment barrier (RAC 08).
Other Events:
Event during maintenance of non-locked equipment (except maintenance that requires the equipment to be unlocked) (RAC 04);
Exposure to uncontrolled hazardous energies (RAC 04);
Exposure to places classified as confined spaces without the appropriate controls (RAC 06);
Excess or lack of oxygen in the environment (RAC 06);
Occurrence of engulfment or drowning in any volume and quantity (RAC 06).
Severity analysis by demand:
Events involving attacks by animals or venomous insects;
Events involving violence.

Table 04 – SSO Event Tables x Severity (SAP-IM e NOR-0003)

Below are other examples of events and/or scenarios that, although not exhaustive, must be considered in the High Potential Safety classification:

- Fire and/or explosion resulting from hot work.
- Event involving the use of a grinder or sander above the shoulder line (including lying down) or below the knee line.
- Any event of leakage or improper direction of the hydro jet above 3000 psi.
- Falling and/or blowout of a tire on an off-road truck undergoing maintenance. – Inadvertent activation of equipment where there could be people in the line of fire.
- Attack by dangerous/venomous/poisonous animals or insect colony.
- Collapse/fall related to large vegetation where there could be people in the line of fire.
- Collapse/fall related to large equipment, structures or buildings.
- Derailment and/or collisions involving railway trains.
- Fire/explosion or faults that could trigger fires or explosions.
- Equipment falling in places with different levels (hoppers, bridges, rivers, slopes).
- Leak/release of dangerous substance.
- Violence.
- Failure relating to the integrity or readiness of the fire and explosion protection system.
- Any situation associated with the state of conservation of dams (reliability of overflow structures, percolation, deformations and settlements, deterioration of slopes/walls).

IMPORTANT: In case of doubts about the classification or eligibility of level 1 and 2 events, a deliberative committee will be formed to make a final verdict regarding the classification of the event.

For N events, the committee will be led by the General Management of Specialized Services (part of the Board of Directors of the Integrated HSE Center, 2LD) and composed of members of the 2LD of the HSE Board. The participation of members of the 1LD and other areas may be requested, at the discretion of the 2LD of the SSMA Board, with the intention of providing additional clarifications about the event, as long as the participants do not have a conflict of interest with the event under discussion.

The final decision on the classification of event N will be made by the HSE 2LD Director and for events C it will be made by the Corporate Sustainability Department, based on the requirements of this procedure and annexes, and, if necessary, on recognized standards and publications on the topic.

To evaluate the potential for falling object scenarios, apply the Falling Object Severity Potential Calculator found in Annex 7 Falling Object Severity Potential Calculator.

1.3 Relationship with Work

Relationship with Work is a classification category relating to each injured person and not the event as a whole. Therefore, there must be a classification for each victim and these classifications may be different from each other in the same event.

The Relationship with Work must be classified according to the categories defined below.

1.3.1. Occupational

An injury or illness should be considered occupational if an event or exposure that occurred in the workplace contributed to the resulting condition or aggravated a pre-existing injury or illness. "Work environment" is considered to be the establishment and other locations (physical locations, equipment, vehicles, etc.) where workers are present as a condition of their activities.

Some exceptions apply:

- At the time of the injury or illness, the worker was present in the workplace as a member of the public and not as a worker.

Note: For a person to be considered a "member of the public" there cannot be any relationship between the person's presence on company premises and their status as an employee. It is important to note that the focus is on the person's status as an employee, not the activity in which the person was engaged at the time of the event or exposure.

- Injuries or illnesses resulting exclusively from voluntary participation in wellness programs, vaccination campaigns, recreational activities, sports, among others.
Note: Activities or examinations required by the company or by local legislation are not covered by this exception.
- Injuries or illnesses resulting from the consumption of food, drinks or the preparation of food or drinks for personal consumption (purchased within the workplace or brought from home).
- Injuries or illnesses resulting exclusively from personal activities (not related to work activities) in the workplace and outside contractual (paid) working hours.
- Injuries or illnesses resulting solely from self-medication for a condition not related to work or intentionally caused by the worker himself.
- Illnesses such as flu or the common cold.
Note: Contagious diseases such as tuberculosis, brucellosis, hepatitis A or epidemics are considered “occupational” if they are hired at work.
- Diseases of an endemic nature that affect a resident worker.
Note: Expatriate workers are not considered residents for employment relationship classification purposes.
- Mental illnesses.
Note: Unless the worker voluntarily presents the company with a medical certificate stating that he or she has a mental illness that is related to work.

1.3.2. Commuting

Injuries occurring on the way to Vale will be considered those that meet the following criteria:

- It occurs during the employee's commute, whether from their home to the workplace (until the time clock is punched at the beginning of the workday) or from the workplace (after the time clock is punched at the end of the workday) to their residence, regardless of the means of transportation (provided by the company or for personal use), including walking.

Notes:

1. When returning home, if the commute is interrupted for reasons unrelated to work, the end of the commute is considered to be the moment when the employee arrives at their first destination after leaving the company. From this point on, any adverse event must be considered non-occupational. When going to work, if the commute is interrupted for reasons unrelated to work, the beginning of the commute is considered to be the moment in which the employee leaves a place to go directly to work.
2. In cases where the employee is staying in a hotel or similar, the same concept of residence applies to the workplace or vice versa.

For classification purposes, due to the great variety and particularities involved in some events that occurred during the route, cases will be evaluated individually and independently of the definition of Controlled Area/Monitored Area through the deliberative committee led by the 2LD of Specialized Services.

1.3.3. Non-Occupational

If the injury or illness does not meet the criteria defined for “Occupational” or “Commute”, it must be considered “Non-Occupational”. The mischaracterization of the relationship with work of any event occurring in the workplace must be formally justified, following local procedure.

1.4 Classification of the event occurrence area (Controlled Area or Monitored Area)

For the purpose of classification related to the event's area of occurrence, we will adopt the definitions of controlled areas and monitored areas established in PNR-000067 Health, Safety and Environmental Management for Vale Contractors and referenced in the main document of PNR-000070 Event Management Health, Safety, Environment, Community and Process Safety.

1.5 Accounting for injury and illness

The accounting concept aims to standardize the injuries and illnesses that make up some of Vale's strategic indicators, and is a mandatory requirement for the purposes of applying this standard.

The events and Hours of Exposure to Risks of companies contracted for services in events occurring in Areas Classified as Monitored Areas will not be part of this accounting.

The events and Hours of Exposure to Risks of Vale employees in Areas Classified as Controlled or Monitored Areas will be part of the accounting process.

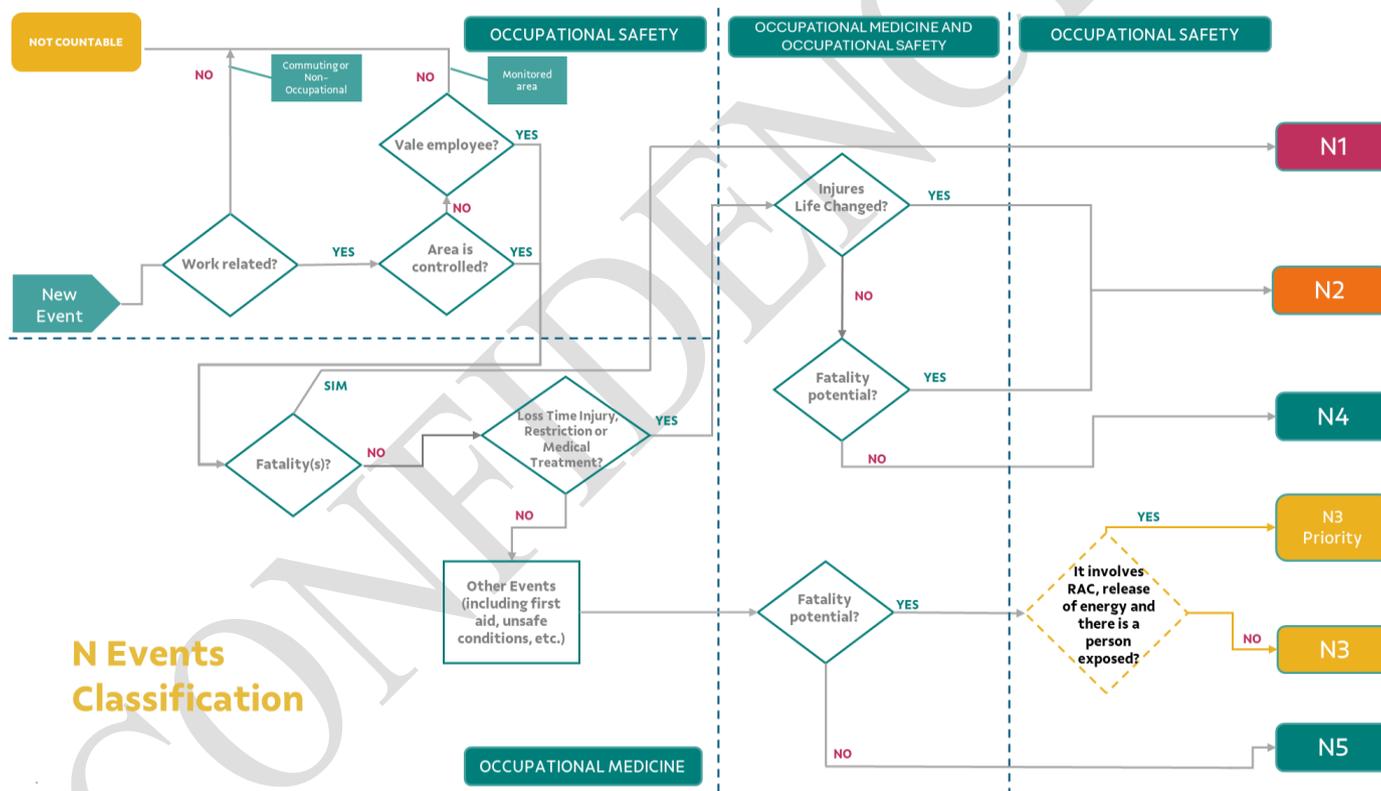
This concept is not related to the communication and recording of events, a process that has its requirements established and detailed in the body of this procedure.

The table below shows which events are, from the point of view of this document, countable taking into account the aspects of Relationship with Work (Occupational and Non-Occupational) and Relationship with the Area (Controlled and Monitored).

Classification of the event occurrence area	Accounting (Reportable/Recordable)	
	VALE	CONTRACTORS
Controlled	YES	YES
Monitorada	YES	NO
Controlled	NO	NO
Monitored	NO	NO

Note: For current contracts for the provision of services, or supply of materials, inputs, etc. the object of the contract, the activities and the scope for classifying events must be observed until the total transition is made to correlate controlled and monitored areas according to the definitions of PNR 000067 Health, Safety and Environment Management for Vale Contractors.

The flowchart below aims to assist the event classification process:



N Events Classification

1.5.1 Characterization of “new cases”

An injury or illness is considered a new case if:

- The worker has never previously suffered an injury/illness of the same type and in the same part of the body, which has been recorded or;
- The worker has previously suffered an injury/illness of the same type and to the same part of the body, which has been recorded, but has fully recovered from that injury/illness (all signs and symptoms have disappeared) and an event or exposure in the environment work resulted in the reappearance of signs or symptoms.

CHAPTER 2: Medical conduct guide for classifying injuries and illnesses

- Guidelines for medical conduct will be based on the severity of the trauma and will be based on medical recommendations in the literature, with the principle of maintaining conditions that guarantee full recovery from the injury, avoiding exposing the individual to risks that could worsen the injury or prolong their treatment.
- The classification only applies to occupational injuries and illnesses. This will be done based on the severity of the injury(ies) evidenced after evaluation at the health service. The initial assessment, whenever possible and necessary, should be revised to estimate the conditions for returning to work. This assessment does not change the previous classification of greater severity. It is a medical act that involves judgment based on prior knowledge of individual and work conditions and the probability of recovery of previous health status.
- Assessment at the operational unit's outpatient clinic consists of an interview (anamnesis), physical examination and complementary tests (if necessary to confirm diagnostic hypotheses). When this does not identify a consistent report between the injury mechanism and a work-related injury, the Occupational Medicine office must register it in accordance with the legislation of each country as assistance care only, or simple medical care (not related to work). Concomitantly, Occupational Safety must be notified immediately to proceed with the investigation of the employee's report.
- In the initial care for the victim, all information obtained by witnesses must be used and also through the assessment of the scene with the aim of identifying possible mechanisms of trauma that may have affected the victim.
- The interview with the victim, complete physical examination and additional tests will provide additional information for the exact diagnosis. Understanding the trauma mechanism is important so that you can provide better care to the victim, increasing their chances of recovery and quality of life. The request for additional exams should not serve as an indication of the severity of the injury for classification purposes.
- The classification of the severity of the injury should be done during the assessment during the first visit to the health service, to ensure consistency with the initial presentation of the injury.
- The natural evolution of the clinical state will not be considered to characterize less severity than the initial classification of the injury.
- Events communicated late, without the possibility of observing the initial injury or the natural evolution of the injury by a qualified professional, can hinder and even prevent the classification of the injury.
- The injury and the best medical practice indicated for the event will be considered as classification criteria for classifying the event.
- If an injury worsens and requires new interventions or medical procedures, its initial classification must be reviewed and adapted to the final result, including the period of time related to cases of restriction or time off work.
- Occupational safety must accompany the employee to the health service with initial information about the event to inform the outpatient clinic physician, either before or concomitantly with the initial assessment of the employee involved, thus, we may already have data that can help to better understand the injury and medical conduct.
- To avoid possible miscommunications and questions regarding the classification of the injury, only after the Local Committee validates, when necessary, and communicates to the health manager, will this classification be transmitted to other areas (safety, employee manager), complying with all deadlines determined in this annex.

2.1. Definitions

- **First Aid Case (FAC):** Any minor injuries that require first aid care, administered by a doctor or trained first responder. If the injury only requires medical procedures contained in the list below, it should be considered First Aid:
 - Use of medication for diagnosis (e.g. contrast) or in doses authorized for use without a medical prescription;
 - Administration of tetanus vaccine or booster, etc.;
 - Cleaning lesions on the skin and mucous membrane;
 - Use of hot and cold therapy (e.g. compresses, non-prescription creams/lotions for local relief, except for musculoskeletal disorders);
 - Use of non-rigid immobilization (e.g. bandages);
 - Use of simple wound dressings;
 - Drilling of a nail to alleviate pressure from an internal hematoma;

- Use of eye patches;
 - Removal of foreign bodies using only irrigation or flexible cotton swabs;
 - Removal of splinters or foreign material from areas other than the eyes by irrigation, tweezers, flexible cotton swabs or other simple means;
 - Use of finger and toe splints;
 - Use of massages;
 - Drinking fluids to relieve heat stress;
 - Use of temporary immobilization instruments when transporting a victim (neck collar, backboard, etc.).
- **Medical Treatment Case (MTC):** Any injuries or illnesses that require specific medical treatment (that are not included in the First Aid list) and do not result in lost time or restricted work.
 - Every diagnosis of illness must be considered at least a Medical Treatment.
 - Loss of consciousness, even if temporary, due to a workplace event or exposure is also considered at least a Medical Treatment.
 - **Restricted Workday Case (RWC):** Any injuries or illnesses that prevent the worker from performing part of their regular activities/tasks on the day after the event.
 - These are cases where the employee is not kept from working, but cannot perform all the activities they normally performs in their role.
 - The restriction cannot be applied through a situation that is characterized as a deviation from the original function of the worker's position.
 - The criterion to ensure that there is no function deviation is that the worker can continue to perform part of the tasks or activities that are listed in their job description.
Note: The description of the position and function must be provided by the manager to the area responsible for characterizing the restriction.
 - The impossibility of using PPE for any of their activities already characterizes the restriction. The worker will be considered apt to perform an activity when they are able to use the mandatory PPE for their activities and tasks.
 - The formalization of restrictions must follow the rules set forth in local procedures.
 - Even in cases where the worker is transferred to another shift, the injury/illness remains restricted.
 - If the worker needs to have the length of their shift adjusted, that is, they cannot work the full number of hours they are supposed to, the injury/illness is considered Restricted.
 - Performing tasks such as reading procedures or training is not considered a Restriction. If the employee is unable to perform any of their routine activities, the injury/illness must be classified as Lost Time.
 - If exposure to the work environment causes or contributes to aggravating the injury/illness, the worker must be removed for treatment and the classification must be revised to Lost Time.
 - **Lost Workday Case (LWC)/Lost Time:** Any injuries or illnesses that prevent the worker from returning to work on the day after the event.
 - After the occurrence of injury or illness, the worker's shift cannot be changed/adjusted with the intent to change the classification of the injury/illness.
 - **Fatality (FAT):** Any injuries or illnesses that result in death.
 - **Coagulated Blood:** a hematoma under a more solid part (bony plane), and due to its more pronounced protrusion (bump).
 - **Lymphatic Bumps:** caused by lymphatic spillage into the connective tissue.
 - **Shock (biodynamic energy):** a morbid entity triggered by various causes that promote an intense decrease in cardiac output with consequent profound circulatory crises, repercussions on cellular metabolism and exhaustion phenomena that make it impossible, early, late, temporarily or permanently, for the body to regain balance. When classifying shock, one must take into account the main type of hemodynamic disorder that is responsible for the onset and maintenance of the syndrome. Today, the classification is based on a pathophysiological concept and hemodynamic changes. The etiology was left aside, since the same shock can undergo profound changes in hemodynamic terms. Thus, they are classified as: cardiogenic shock, obstructive shock, hypovolemic shock, and peripheral shock.

- **Injury Classification Committee:** Technical group composed of at least 3 (three) Vale occupational physicians, with a guaranteed minimum representation of 2 (two) operational units. A business unit that does not have 3 doctors may invite a Vale doctor from another business unit to join the committee. In units where there is no Vale doctor, Vale’s reference doctor must be consulted. Every classification must be performed by 2 doctors from the accident event unit, preferably.
- **Contusion:** Generic term for closed injuries, without an opening in the skin; associated with internal bleeding; it is generally produced by a blunt instrument.
- **Occupational illness:** An illness acquired, triggered or provoked, by the exercise of work peculiar to a given activity or due to special conditions in which the work is performed and is directly related to it.
- **Sprains:** injuries to the ligaments in the joint caused by sudden or twisting movement beyond natural capacity, without displacement of the joint surfaces. Sprains are classified into three degrees:
 - Degree I involves a microscopic tear in the ligament.
 - Degree II involves a macroscopic lesion.
 - Degree III a complete tear of the ligament.

Degree I and II injuries are treated conservatively, with rest, ice, elevation of the extremity, and anti-inflammatory medications for 24 to 72 hours. Afterwards, stability is assessed and physical therapy begins, with a gradual return to physical activity.

Degree III injuries often present rupture of the ligaments, which can make the joint unstable. Conservative treatment can be carried out initially, with immobilization for around 6 weeks, after which a physical therapy program begins.

Note: In general, it is very difficult to distinguish in pre-hospital care the exact type of extremity trauma. All three types are serious and all must be evaluated and treated appropriately.

- **Erythema:** “Flushing”, “redness”; produced by vasodilation; typical from a slap; can be produced by different means; is not considered bodily injury.
- **Edema:** “Swelling” – consists of an abnormal accumulation of fluid in the interstitial extracellular compartment or in body cavities due to increased hydrostatic pressure, decreased colloid osmotic pressure, increased vascular permeability (inflammation) and decreased lymphatic drainage.
- **Excoriation:** The abrasions are commonly known as scratches or friction burns. They occur when the skin rubs against a rough surface. In this type of wound, the upper portion of the skin is removed, producing a small amount of bleeding. The abrasions in general are quite painful due to the exposure of the nerve endings that are affected along with the skin. Excoriation can be considered serious if it involves removing a large surface of skin or becoming contaminated by foreign material.
- **Ecchymosis:** These are injuries that form hemorrhagic infiltrations and coagulation in tissue meshes. They are generally superficial, but can appear in muscle masses, viscera and periosteum. Most of the time, it faithfully prints the shape of the object that gave rise to it. Ecchymosis does not always appear immediately or at the site of the trauma. When it is produced by a cylindrical object, two long and parallel bruises appear, due to the extravasation of blood occurring next to the trauma. When the ecchymosis is punctate, it is called petechiae.

The shade of the injury informs the likely date it occurred

RED-BRONZED	1ST DAY
PURPLE	2nd to 3rd DAY
BLUE	4th to 6th DAY
GREEN	7th to 10th DAY
YELLOW GREEN	10th to 12th DAY
YELLOW	12th to 17th OR LONGER

- **Entrapment:** Type of injury caused by the penetration of a sharp and consistent object into any part of the body.
- **Impalement:** A special form of entrapment is characterized by the penetration of an object with a large longitudinal axis, mostly consistent and thin, into the anus or perineal region.

- **Wound:** Generic term for open injury, with an opening on the skin; can be produced by any instrument.
- **Blunt force trauma:** These are open injuries whose action ruptured the soft tissues. They are produced by traction, explosion, dragging, compression, or pressure. They are produced by surface instruments with a dull edge.
- **Open wounds:**
 - **Piercing:** Piercing or penetrating injuries are produced by objects that penetrate the skin, piercing and reaching deep areas. This type of wound generally does not bleed freely.
 - **Laceration:** It is the most common type of open wound. Also commonly referred to as cutting. This type of wound has irregular edges in the affected tissue. It is usually produced by forces that pull on the skin tissue.
 - **Incision:** This is a wound that has regular and well-defined edges, resembling a surgical procedure.
 - **Avulsion:** It consists of extracting or removing an organ or part of the body through a violent act or force. An avulsion can destroy or remove pieces of skin, cartilage, or body parts. The avulsed part may be partially attached to the body or completely separated from the body. If an entire part of the body is removed as a result of avulsion, then it is called "TRAUMATIC AMPUTATION".
- **Fractures:** These are characterized by the solution of partial or total continuity of the bones. They are called Direct, when they occur at the site of the trauma, and Indirect, when it comes from violence in a region more or less distant from the fractured site. They can be reduced to a simple line or several lines, or even several fragments, known as a comminuted fracture. Sometimes the fracture is closed (subcutaneous) and other times it is open (exposed). Regarding their extension, fractures are divided into complete and incomplete.
- **Fulmination:** When atmospheric electricity (lightning) causes lethal damage to humans. Major trauma will be observed at necropsy, such as spontaneous amputations of limbs, generalized fractures, destruction of genitalia, disappearance of the jaw and tongue, rupture of large vessels and hollow viscera, caused by the intense thermal action of the lightning.
- **Fulguration:** When atmospheric electricity (lightning) causes bodily harm. On physical examination we will find arboriform, dendritic designs of vasomotor origin.
- **Hematoma:** This is a collection of blood produced by the rupture of a larger vessel and its non-diffusion into the soft tissue meshes. It is characterized by its floating sensation, its absorption is slower than bruising.
- **Intracranial hemorrhages:**
 - **Extradural or Epidural:** Located between the bone and the dura mater membrane, always accompanied by a skull fracture; always of traumatic origin; may form a hematoma and present a lucid interval (variable interval of consciousness between the impact and the signs and symptoms of the hematoma).
 - **Subdural:** Located between the dura mater and the arachnoid membrane; associated with sudden deceleration of the head; almost always of traumatic origin; may form acute or chronic hematoma; may present on the side opposite to the impact (kickback mechanism).
 - **Subarachnoid Hemorrhage:** Located between the arachnoid membrane and the pia mater membrane, where the CSF (cerebrospinal fluid) circulates; it can be of traumatic or spontaneous origin due to rupture of an aneurysm (vessel malformation); may form hematoma.
 - **Cerebral Hemorrhage:** Located below the pia mater, it can be of traumatic or spontaneous origin; "stroke"; may form hematoma.
- **Hypothermia:** This occurs when the body temperature drops below 35°C. It is life-threatening and the victim may not always be aware of it due to problems such as tiredness, confusion and disorientation.

Clinical Aspects of Decreased Body Temperature

37° C	Normal oral temperature
36 ° C	Increased metabolic rate to compensate for heat loss
35 ° C	Intense chills
34 ° C	Conscious and responsive person with normal blood pressure
33 ° C	Onset of severe hypothermia
32 ° C	Mental confusion, blood pressure difficult to measure
31° C	Light-reactive mydriasis / chills
30° C	Loss of progressive awareness / increased muscle stiffness
29° C	Pulse and blood pressure difficult to measure / decreased respiratory rate
28° C	Myocardial irritability (possible ventricular fibrillation)
27° C	No voluntary movements / unreacted pupils / decreased reflexes
26° C	Loss of consciousness
25° C	Ventricular fibrillation may occur
24° C	Pulmonary edema
22/21° C	Maximum ventricular fibrillation risk
20° C	Cardiac arrest

Degree of Frostbite

1st Degree: Erythema	It begins with a marked vasoconstriction giving skin paleness and later a dark red rubescence due to the retention of poor blood in oxygen in the small vessels, which due to the vascular contractility scam are dilated.
2nd Degree: Flictemas	Similar to burns, due to capillary stasis there is a transudation of the plasma raising the skin in the form of ampoules.
3rd Degree: Necrosis or Gangrene	If there is blood coagulation inside the capillaries and an ischemia, there is mortification of the tissues, which are painless, blue or livid.

- **Infections:** These are more or less frequent complications, arising from organic disturbances caused by pathogenic microorganisms and which have a certain evolutionary cycle. Infections can be local or generalized. There are several medico-legal issues arising from such eventualities. Firstly, the problem of infectious diagnosis, the date of onset of the illness and how this occurrence was verified. Also the knowledge of the incubation time as an etiogenic mechanism and the preventive treatment carried out, and whether the occurrence is limited to a cutaneous infection focus or whether the germ has broken the local defense barrier and become generalized, producing septicemia or pyoderma, now called systemic inflammatory response syndrome (SIRS).
- **Poisoning:** This can be defined as the clinical and/or biochemical consequence of exposure to chemical substances found in the environment or isolated. As an example, of these environmental intoxicating substances, we can mention air, water, food, plants, venomous or poisonous animals.
 - **Toxic substance:** This is any substance that causes injury or death if ingested, inoculated, absorbed or inhaled in relatively small quantities. Poisoning can be classified according to the route through which the substance enters the body:
 - **Ingestion:** The toxic substance enters through the mouth and is absorbed by the digestive system.
 - **Inhalation:** The toxic substance enters through the mouth or nose and is absorbed by the mucous membranes of the respiratory system.
 - **Inoculation:** The toxic substance enters through a small opening in the skin. It can be taken to all organs of the body through the circulatory system.
 - **Absorption:** The toxic substance enters through the skin, without breaking it. In this case, the respiratory system can also carry the toxic substance to all organs of the body.
 - **Food poisoning:** The most common situation in these circumstances is food intake that contains substances or microorganisms that are harmful to health. Here, a distinction must be made between poisonings. These are caused by chemical substances of defined composition. Food poisoning is produced by an anaphylaxis mechanism when eating spoiled or contaminated food. The most common food poisoning infections are those produced by salmonella (salmonellosis), botulinum bacilli (botulism) and staphylococci (Micrococcus aureus).

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- **Injuries Produced by Perforating Instrument:** The characteristic lesions are point-shaped, are called punctiform wounds and they rarely bleed (external).
- **Injuries Produced by Perforating-Blunt Instruments:** These characteristic injuries are caused by an entry hole, similar to that produced by a piercing instrument, but with bruised and mortified edges.
- **Injuries Produced by Sharp Instruments:** These injuries are almost always serious, deep reaching various planes and causing the most diverse forms of injury.
- **Eye injuries:** Eye injuries can involve minimal circumstances such as a speck in the eye and also very serious situations, such as loss of vision, if the victim is not treated properly. Any injury to the eye must be considered relevant and must require immediate specialized medical attention. Types of eye injury:
 - **Penetrating eye injuries:** These constitute a serious emergency. Sharp objects such as a knife, pencil or needle tool barbs and high velocity specks can become impaled in the eye.
 - **Blow to the eye:** They can be insignificant or very serious and can lead to loss of vision. They deserve immediate medical attention.
 - **Chemical eye burn:** Chemical burns to the eye are extremely susceptible to produce vision loss. Immediate care can mean the difference between sight and blindness. Damage to the eye can be irreversible within 1 to 5 minutes, so the chemical must be removed immediately.
 - **Eye avulsion:** a violent blow to the eye region may cause avulsion of the eye.
 - **Foreign body in the eye:** Presence of foreign bodies, loose, not impaled, in the eyes.
- **Dislocations:** These are characterized by the displacement of two bones whose articulating surfaces no longer maintain their common contact relationships. They are called complete when the contact surfaces move completely apart, and incomplete, when the loss of contact between the articular surfaces is partial. They can be closed and exposed.
- **Burns:** These are injuries that affect the skin and other tissues, destroying them either partially or completely. In this type of injury, there is a loss of the ability to adequately perform essential functions (protection, regulation of fluid loss and temperature, circulation, movements, etc.). These are injuries that heat, in any of its forms, causes when it acts directly on the skin or body. They are simple when the agent is heat: liquids, vapors, heated solids, flammable substances (ether, gasoline, kerosene), non-ionizing radiation (sun, infrared, ultraviolet, and laser beams). They are complex when the agent is heat/friction (electricity, x-rays, gamma rays, neutrons, plastic liquids, greases under pressure). Burns are classified according to depth, extent or etiology.
 - **Regarding depth:**
 - **1st Degree (superficial partial thickness):** Compromises the epidermis. Presents marked erythema and intense pain. Evolves spontaneously in 24 to 48 hours. Example: burn from sun exposure.
 - **2nd Degree (Intermediate partial thickness):** This compromises the epidermis and part of the dermis (preserves the skin appendages). Presents blisters (blisters) and intense pain.
 - **3rd Degree (full thickness):** This compromises the entire dermis with destruction of the skin appendages. It has a leathery, dry appearance, may have visible vessels, a whitish or charred color. It is a painless injury. Examples: burns caused by electricity, chemicals, flammable substances with prolonged contact.
 - **4th Degree:** Charring, superficial or deep, of all tissues, including bones, with the death of the individual.
 - **Regarding the extent:** The severity of the clinical case is related to the extent of the affected body area (Burned Body Surface). Using the rule of 9 for adults: Head and Limbs correspond to 9% of the body surface, Genitalia and Hand are equal to 1% and Trunk is 18% (front and back).
 - Small Burn: > 14 years old – less than 15% Burned Body Surface
 - 3rd degree burns over less than 2% Burned Body Surface
 - Medium Burns: > 14 years – 15 to 30% Burned Body Surface
 - 3rd degree burns between 2 and 5% Burned Body Surface
 - Large Burns: > 14 years old – more than 30% Burned Body Surface
 - 3rd degree burns above 5% Burned Body Surface on hands, feet, face, genitals, associated with other traumas or pathologies.
- **Regarding etiology:**

- Thermal Agents: heat or cold.
 - Physical Agents: electricity and radioactivity.
 - Chemical Agents: acids and bases
- **Respiratory tract burns:** Whenever the victim has burns on the face or head, or if the event occurs in a confined space, it will be necessary to carefully assess the presence of signs of respiratory burns: singed nose hairs, blackened nasal mucosa, difficulty breathing, pain when breathing, burns around the face and unconsciousness.
 - **Electrical Burn:** These are typical injuries caused by thermal action.
 - Action on the muscles: destruction of tissues.
 - Action on the vessels: blood, as a good conductor of electricity, causes destruction of vessels and, consequently, neighboring tissues.
 - Nerve Injuries: these are paresthesias, neuritis, muscular atrophies and paralysis.
 - Electric Ophthalmia: cataract formation and decreased visual acuity.
 - Jellineck Electromechanical Injuries: when physical energy causes a mechanical energy injury, that is, injuries produced when the person is thrown from a distance or abruptly thrown to the ground, causing abrasions, contusions, incised wounds, which can cause death.
 - **Thermonosis:** This is organic damage or death caused by the action of ambient temperature, sunlight, excessive relative humidity and air vitiation or artificial heat.
 - **INSOLATION:** The action of temperature, sunlight, not through direct action on the body, but rather through increased sweating without ingesting liquids; almost always accidental in origin, e.g. alcoholism, inappropriate clothing or pre-existing pathologies (cardiorespiratory).
 - **INTERMATION:** Temperature action by an artificial source of heat, e.g. boiler, stove, in confined or open spaces without ventilation, which may be accidental (unfortunate) or exceptionally criminal.
 - **Head Trauma:**
 - **Traumatic Brain Injury (TBI):** Generic term for variable degrees of brain mass impairment; produced by different instruments.
 - **Head trauma:** Generic term for variable degrees of involvement of the soft parts of the head, without involvement of the brain mass; produced by different instruments.
 - **Cerebral (Brain) Compression:** signs and symptoms of varying degrees of cerebral (encephalic) involvement, without intracranial perivascular hemorrhage; A typical example is the knockout boxer.
 - **Cerebral (Brain) Contusion:** signs and symptoms of varying degrees of cerebral (encephalic) involvement, with intracranial perivascular hemorrhage; may form intracranial hematoma (“clots” within the cranial cavity).
 - **Vitriolage:** The name comes from vitriol, which means sulfuric acid. These are visceral or cutaneous injuries produced by caustic substances, which may be of a legal, criminal, suicidal or accidental nature.

2.2. Injury Classification Guidance Table

The detailed characterizations of injuries and medical procedures found in the table below (not exhaustive) should serve as a basis for the unification of procedures, being the technical reference to be followed by health teams with the aim of guaranteeing uniform classification in the company.

SKELETAL TRAUMAS			
Injuries	Analysis of Severity	Initial Classification	Posterior Reassessment
Sprains in upper or lower limbs (light)	Mild injuries that respond to the placement of ice in the first care and it does not evolve to an edema, local pain, slope ecchymosis, and difficulty in using the affected joint. There is no need for specialist evaluation.	FAC	After the first 24 hours of the injury, if there is a presence of an edema or there is difficulty in the use of the joint (functional disability), the employee should be referred for evaluation with a specialist, and classified as a MTC .
	Mild injuries such as local pain and / or edema and / or ecchymosis that respond to ice or initial medication in the first care, and does not evolve to the difficulty of using the		

	<p>affected joint. There is no need for immobilization.</p> <p>The decision to restrict (RWC) or loss time (LWC) an employee will depend on the aspects of the operational area, the employee's activity and their work capacity, the type of immobilization proposed for treatment (eg robofoot), including conditions of mobility and clinical situation according to degree of sprain, its extension, presence of edema / pain and evolution of the case.</p>		<p>Check the risk of aggravation to decide on release for work activities. If there is any activity that can not be exercised by the employee, this will be considered as a RWC.</p>
<p>Sprains in upper or lower limbs (moderate to serious)</p>	<p>Injuries that involve within the first 24 hours with edema, local pain, bruising or local hematoma, difficulty in using the affected joint.</p> <p>Even after the first care (ice-laying), these signs remain present after 24 hours of injury, requiring immobilization of the joint (splints, bandage or plaster).</p>	<p>They will always be initially classified as MTC.</p>	<p>The presence of the signs described (see analysis of gravity column) after 24 hours of the injury allied to the need for joint rest does not allow immediate readaptation. In the case of injuries where there is significant edema and requiring maintenance of the affected part elevated for the purpose of reducing local edema, in case of immobilization of any nature, or if there is rupture of ligaments or tendons requiring surgical correction, the employee shall be away from work according to the doctor's prescription and will be classified as LWC.</p> <p>After medical release of a new MTC, an assessment should be made to check the employee's current condition and return to work activities, who may be required a period of work restriction which should be computed as RWC.</p> <p>In cases where there was reduction of edema after 24 hours or if it is minimal (residual) and there is no need to keep the limb elevated, a work restriction assessment can be made and if possible, it will be considered RWC.</p>
<p>Dislocations</p>	<p>They are injuries that evolve with significant deformity, pain and functional incapacity, deserving attention with immediate immobilization and removal to the Hospital.</p>	<p>They will always be classified at least as MTC</p>	<p>After the initial orthopedic care it will be necessary a period of immobilization with a splint or plaster for at least 48 hours. As it is a trauma that is more severe than sprains and can usually occur with soft tissue injury, immobilization is mandatory. It will be considered a LWC with an initial period of observation (at home) of 48 hours with subsequent evaluation to verify the improvement of the signs.</p> <p>After medical release of a new MTC, an assessment should be made to check the employee's current condition and return to work activities, who may be required a period of work restriction which should be computed as RWC.</p> <p>The natural evolution of a dislocation provides immobilization from 7 to 15 days depending on the joint involved.</p> <p>The decision to return to work after the initial 48 hours will depend on the affected joint (upper or lower limbs), the need for permanent joint rest and the employee's activity.</p> <p>If there is a rupture of ligaments or tendons, a greater time of separation and surgery may be needed.</p>
<p>Fractures in Upper and Lower Limbs</p>	<p>Fractures occur in the first 24 hours with the following signs and symptoms: pain, deformity, local flaccidity, edema, functional disability and crepitus.</p> <p>They should be treated with immediate immobilization and employee removal for appropriate medical treatment.</p>	<p>They will always be classified at least as MTC</p>	<p>In fractures of long bones of the upper limb and bones of the lower limb, however much the activity allows, return to work is not advisable in any activity for the first 15 days. Therefore they should be classified as LWC.</p> <p>After the initial 15 days, a reevaluation should be carried out to verify the possibility of returning to work. In cases where there is no indication of recovery or if there is a risk of worsening, the local social security offices should be informed.</p> <p>In fractures that progress to immediate surgery, it's mandatory the employee, to be away from work, and the case is classified as LWC. On the 15th day, a reassessment must be made when it will be decided if the employee will need a labor restriction or continued away. The classification will remain as a LWC.</p>

			<p>In phalangeal fractures the decision to return to work will be evaluated according to the type of fracture, its extension, presence of edema and evolution of the case, as well as analysis of work activities and musculoskeletal demands. When work restriction is recommended, it will be classified as a RWC. When recommended an initial period of rest at home for more than 12 hours to avoid secondary aggravation will be classified as a LWC.</p> <p>In the case of cracks in the phalanges where there is adequate alignment, presence of mild edema and mild pain, work restriction can be recommended as long as the function performed does not present a risk of aggravation. It will then be considered a RWC case.</p>
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WOUNDS			
Injuries	Analysis of Severity	Initial Classification	Posterior Reassessment
Light Trauma - Contusion or Wounds	Regardless of the type of injury, mild traumas present themselves as having a little extension, being shallow, without great possibility of infection, can be treated by the usage of bandages and can be executed by the local health team without the need for further care or follow-up.	They will be classified as FAC	The decision to return to work will be based on the evaluation of the risk of aggravation of the injury (contamination, etc.) versus his work activity. If there is a need to restrict at least one employee activity, it will be classified as RWC
Moderate to Serious Trauma - Contusion or Injury	<p>Regardless of the type of injury, moderate to serious traumas present medium to large extension, are deep and have a possibility of infection, accompanied by edema, hematoma or other signs of important trauma that require local sutures.</p> <p>They involve areas of articulation or are multiple.</p> <p>They will need monitoring by the health team beyond the first 24 hours to assess the patient's condition and not to categorize the injury. The lesion can progress from a minor to a greater severity.</p>	Will be classified at least as MTC	<p>The decision to return to work will be based on the evaluation of the risk of aggravation of the injury (contamination, etc.) versus his work activity. If there is a need to restrict at least one employee activity, it will be classified as RWC</p> <p>In the case of multiple injuries on the hand that are accompanied by edema, local hematoma and, especially if the folds are affected, the most appropriate conduct is immobilization of the injury after suturing, lifting and resting of the hand for 12 hours with subsequent reevaluation. In these cases the classification will be LWC.</p> <p>Large injuries on lower limbs should also be carefully evaluated in order to avoid the effect of orthostatism that may aggravate the injury. In these cases it is advised to rest for at least 12 hours to avoid delayed recovery of the wound (venous stasis and infectious complications). In this case the classification will be LWC.</p> <p>In the two cases above after the two initial days of rest, it is possible to decide on the labor restriction (RWC) since there is no longer a chance of worsening of the case or delayed recovery of the injury.</p>

BURNS			
Injuries	Analysis of Severity	Initial Classification	Posterior Reassessment
First Degree Burns	When the burns are of small extension (small burnt).	They can be classified as FAC only if bandages are necessary.	The decision to return to work will be based on the evaluation of the risk of aggravation of the injury (contamination, etc.) and the type of activity performed by the employee.

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			In general, they do not require removal of the activity, but may generate a RWC in cases where the employee will have restrictions on his or her work.
	When the burns are medium or large (medium or large burns).	They must be classified as MTC , as it will require internal or external technical follow-up, in addition to dressings.	The decision to return to work will be based on the evaluation of the risk of aggravation of the injury (contamination, etc.), the type of activity performed by the employee and the general clinical conditions of the employee, in these cases will be classified as a RWC . In cases where there is great impairment of the general state, there may be a need of the employee to be away from the activities for electrolyte replacement and pain control. In these cases it will be classified as a LWC .
Second and Third Degree Burns	Regardless of the extent of the burn, they will require follow-up by the medical staff for a longer period of time.	They must be classified at least as an MTC .	The decision to return to work will be based on the evaluation of the risk of aggravation of the injury (contamination, etc.), the type of activity performed by the employee and the general clinical conditions of the employee, in these cases will be classified as a RWC . In cases where there is great impairment of the general state, there may be a need to be away of activities for electrolyte replacement and pain control. In these cases it will be classified as a LWC .

EYE INJURIES

Injuries	Analysis of Severity	Initial Classification	Posterior Reassessment
Foreign body in eyes (light injuries).	They usually occur with tearing, foreign body sensation, hyperemia, visual changes and local pain. During the first care given by the health team it is possible to remove the foreign body with almost total regression of the symptoms.	They will be classified at least as FAC	It is generally not necessary to leave work in these cases.
Foreign body in the eyes, injuries secondary to burns, blow to eyes, penetrating injuries (moderate to serious injuries).	They usually occur with tearing, foreign body sensation, hyperemia, visual changes, local pain. Even after the first care, removal of the foreign body and total regression of symptoms are not possible. Symptoms persist after thorough eye wash and after maneuvers to remove foreign body. The patient is then sent for specialized evaluation with an ophthalmologist..	They will be classified at least as a MTC .	Depending on the type of injury (corneal abrasion, secondary infection, etc.), beyond the application of topical medication, there may be a need for total or partial occlusion of the eyes. In cases of occlusion, it is recommended that the employee be kept in rest for 24 or 48 hours as assessed by the ophthalmologist and the event is then classified as a LWC . In cases where occlusion is not recommended the readaptation should take into account the risk of aggravation of the injury (contamination, etc.), the type of activity performed by the employee and the general clinical conditions of the employee. If return to work is possible the event will be classified as RWC . <i>In any case of return to work, the ophthalmologist should be asked to provide a complete opinion on the case, including a complete ophthalmological exam (fundoscopy, etc.) in order to avoid any further deterioration (eg retinal detachment).</i>

INJURIES TO TEETH

Injuries	Analysis of Severity	Initial Classification	Posterior Reassessment
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<p>Tooth Avulsion</p>	<p>After the first medical attendance is performed, the employee should be referred immediately to the dentist for follow-up.</p>	<p>It will be classified at least as a MTC.</p>	<p>The decision to return to work will be based on the evaluation of the risk of aggravation of the injury (contamination, etc.), the type of activity performed by the employee and the general clinical conditions of the employee.</p> <p>It can generate a loss time if there is a joint injury to the soft tissues requiring suture and major edema. In these cases it should be classified as LWC.</p> <p>In other cases where there is no local edema after the specialized care, the pain is under control and there is no possibility of infection associated with the working conditions, it is possible to return to normal working conditions by remaining a MTC or opt for return to work, which would be classified as a RWC.</p>
<p>Tooth fracture</p>	<p>After the first medical attendance is performed, the employee should be referred immediately to the dentist for follow-up.</p>	<p>It will be classified at least as a MTC.</p>	<p>The decision to return to work will be based on the evaluation of the risk of aggravation of the injury (contamination, etc.), the type of activity performed by the employee and the general clinical conditions of the employee.</p> <p>Usually this type of injury does not require employee to be away if it occurs in isolation and if there is discreet pain.</p> <p>For more severe cases (multiple trauma), task restriction (RWC) or even short loss time may be necessary to control clinical conditions (LWC).</p>

INTOXICATIONS			
Injuries	Analysis of Severity	Initial Classification	Posterior Reassessment
<p>Light acute intoxication</p>	<p>These are the cases in which the intoxication is of light intensity, where the removal of the individual from the place is enough for him to recover his clinical condition. Cases whose symptoms and signs do not cause functional or labor incapacity and allow immediate return to the activities he was performing will be considered light.</p>	<p>They will be classified as at least FAC</p>	<p>There is usually no need to leave work.</p> <p>A specialized assessment may be required. It is classified as a MTC.</p>
<p>Acute moderate or serious intoxications</p>	<p>These are the cases of important local signs and symptoms or systemic reactions with moderate or serious classification.</p>	<p>They will be classified at least as MTC</p>	<p>The decision to return to work will be based on the evaluation of the risk of aggravation of the injury (contamination, etc.), the type of activity performed by the employee and the general clinical conditions of the employee.</p> <p>Generally, cases of moderate to serious poisoning evolve with a subsequent observation period of 24 hours so that the appearance of late symptoms can be expected by evaluating the clinical repercussions of contact with the intoxicating agent. It is monitored in a hospital environment and is then classified as LWC.</p> <p>The decision to return to work should take into account the factors described above and will also depend on the type of substance responsible for the intoxication process. If return to work is possible the event will be classified as a RWC.</p>
<p>Light, moderate or serious chronic intoxication</p>	<p>These are cases whose diagnosis arises from occupational medical research, regardless of the existence of symptoms and evidenced by altered complementary exams, associated with exposure to a risk agent.</p>	<p>They will be classified at least as a MTC.</p>	<p>The decision to return to work will be based on the evaluation of the risk of aggravation of the injury (contamination, etc.), the type of activity performed by the employee and the general clinical conditions of the employee.</p> <p>Chronic intoxication cases may be asymptomatic or not due to prolonged or short and cumulative exposures. Symptomatic cases, those requiring removal from the work environment or follow-up performed in a hospital environment will be classified as a LWC.</p>

			The decision to return to work should take into account the factors described above and will also depend on the type of substance responsible for the intoxication process. If return to work is possible, the event will be classified as a RWC .
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INJURIES FROM VENOMOUS ANIMALS AND INSECTS			
Injuries	Analysis of Severity	Initial Classification	Posterior Reassessment
Light acute injuries	Injury by venomous animals or insects in general, occurs by contact or by the inoculation of toxin of animal origin. We consider cases of light intensity those with reactions signs or symptoms such as edema, papules, pain, bruising, burning, redness and / or mild local hemorrhagic injuries. Mild cases are those whose symptoms and signs do not cause functional or work incapacity and allow immediate return to the activities they were performing.	Will be classified at least as a FAC	There is usually no need to leave work. A specialized assessment may be required. This is classified as MTC .
Acute, moderate or serious injuries	Severity will be considered moderate or serious in cases of contact or inoculation of toxins by venomous or insects when the clinical conditions of the patient manifest signs and symptoms with intensity requiring observation and / or medication due to the known history of hypersensitivity, significant number of bites and / or intensity of reactions produced by the toxin. These are the cases in which the patient is unable to return to his or her usual activities on the same working day.	They will be classified at least as MTC .	The decision to return to work will be based on the evaluation of the risk of aggravation of the injury (contamination, etc.), the type of activity performed by the employee and the general clinical conditions of the employee. Generally cases of moderate to serious poisoning evolve beyond the subsequent observation period of up to 24 hours so that delayed symptoms can be assessed. The monitoring is performed in a hospital environment and is then classified as LWC . The decision to return to work should take into account the factors described above and will also depend on the type of substance responsible for the intoxication process. If return to work is possible, the event will be classified as a RWC .

PSYCHIC TRAUMA (DSM-V)
<p>This category differs from others insofar as its definition does not rest exclusively on symptomatology and evolution but also on the existence of one or other of the following two causal factors: a particularly stressful event triggers an acute stress reaction, or a particularly marked change in the subject's life, which has unpleasant and lasting consequences and leads to an adjustment disorder.</p> <p>Although relatively low psychosocial "stress" ("life events") may anticipate the occurrence of a great number of disorders classified elsewhere in this chapter or influence their clinical picture, it is not always possible to attribute them to an etiological role. It is necessary to take into account factors of vulnerability, often idiosyncratic, characteristic of each individual; in other words, these factors are neither necessary nor sufficient to explain the occurrence and nature of the observed disorder. In contrast, for the disorders assembled here under the international disease classification of F43, it is assumed that their occurrence is always the direct consequence of severe acute stress or persistent trauma. The stressful event or the persistent painful circumstances constitute the primary and essential causal factor in the absence of which the disorder would not have occurred. The disorders encountered in this chapter may thus be regarded as responses unsuited to severe or persistent "stress", in that they interfere with effective adaptive mechanisms and thereby impede social functioning.</p> <p>ICD F43.0 – Acute Stress Reaction Transient disorder that occurs in an individual who does not have any other manifest mental disorder, following exceptional physical and / or psychic stress, and usually disappears within a few hours or a few days. The occurrence and severity of an acute stress reaction are influenced by individual vulnerability factors and the subject's ability to cope with trauma. Symptomatology is typically mixed and variable and initially entails a state of stunning characterized by a narrowing of the field of consciousness and difficulties in maintaining attention or integrating stimuli, and disorientation. This state can be followed either by a distance from the environment (which may take the form of a dissociative stupor - see F44.2) or a hyperactivity agitation (leakage reaction). The disorder is often accompanied by neurovegetative symptoms of panic anxiety (tachycardia, sweating, heat waves). Symptoms usually manifest in the minutes following the occurrence of the stimulus or stressful event and disappear within two to three days (often within a few hours). There may be partial or complete amnesia (F44.0) of the episode. When symptoms persist, a change in diagnosis (and treatment) should be considered.</p> <p>ICD F43.1 Post Traumatic Stress: This disorder is a delayed or protracted response to a stressful (short- or long-term) situation or event, of an exceptionally threatening or catastrophic nature, and which would cause obvious symptoms of disruption in most individuals. Predisposing factors, such as certain personality traits (for example, compulsive, asthenic) or antecedents of the neurotic type, may decrease the threshold for the occurrence of</p>

the syndrome or aggravate its evolution; such factors, however, are not necessary or sufficient to explain the occurrence of the syndrome. Typical symptoms include repeated resurgence of the traumatic event in the form of flashbacks, dreams or nightmares; occur in a durable context of "psychic anesthesia" and emotional dullness, be away from others, insensitivity to the environment, anhedonia, and avoidance of activities or situations that may arouse remembrance of the trauma. The preceding symptoms are usually accompanied by neurovegetative hyperactivity, with hypervigilance, alertness and insomnia, often associated with anxiety, depression or suicidal tendencies. The period separating the occurrence of the trauma from the disorder can range from a few weeks to a few months. The evolution is fluctuating, but it is done for healing in most cases. In a small proportion of cases, the disorder may present a chronic evolution over many years and lead to a lasting personality change (F62.0).

Injuries	Analysis of Severity	Classificação Inicial	Posterior Reassessment
Minor changes	Any change that has fully improved until the medical review on the calendar day immediately following the event. Minor cases are those whose symptoms and signs do not cause functional or work incapacity and allow them to return to the activities they were performing until the calendar day immediately following the event.	Will be classified at least as FAC	There is usually no need to leave work. A specialized assessment may be required. I is classified as MTC .
Moderate or serious changes	Clinical and / or psychic alteration requiring referral for medical evaluation. The employee presents symptomatology being prescribed continuous medical treatment and / or psychological and / or medical follow-up. The use of single-dose medication does not change this classification. These are the cases in which the patient is unable to return to his or her usual activities on the same working day.	They will be classified at least as MTC .	The decision to return to work will be based on the evaluation of the risk of worsening symptoms, the type of activity performed by the employee and the general clinical conditions of the employee.

2.3 Classification of Injuries and Illnesses

- All occupational injuries and illnesses must be classified following the assumptions of Chapter 2 of this annex – Guide to Medical Conduct for Classifying Injuries and Illnesses.
- Any injury or illness must be immediately reported to the local doctor's office so that the classification can be established appropriately by the responsible occupational physician. This classification must be made solely by the doctor's office. Vale's occupational physician may take an evaluation or report from an external professional as a reference, but the final decision on the classification of the occupational injury or illness must be established exclusively by Vale's physician. The Occupational Safety team, in turn, must classify the Relationship with Work according to item 1.3 of this annex.
- If an injury or illness has its initial classification changed, for example in cases of injury worsening, its classification must be reviewed in the original record (SAP-IM), adapting it to the final situation.
- The unit's local procedure must include a process for handling cases that generate time off work and restriction. The process should include a flow of communication between the doctor's office and leadership regarding leave or task restrictions and eventual release of restrictions and return to normal duties. The injured person's leadership is responsible for making their job description available, so that the doctor can define what activities can be performed during this period.

2.3.1 Lives Changed

- Lives Changed is considered to be the set of significant permanent effects caused by occupational injuries or illnesses that have a causal link with work and that have generated a total loss of function of the entire body, equal to or greater than 32%.
- This must be quantified at the end in systemic repercussion, within a maximum period of up to 180 days, counting from the date of the incident. Systemic repercussion is understood as accounting for the injury and/or illness throughout the employee's body. We will use the tables presented in the American Medical Association (AMA) guidelines, 5th edition, for the purpose of calculating this percentage and as a reference. This must be updated every 3 years, using as a basis the most recent edition of Guides to the Evaluation of Permanent Impairment by American Medical Association (Author), Robert D. Rondinelli (Editor), Elizabeth Genovese (Editor), & 3 more.
- Cases of injury or illness that give rise to suspicion of "Lives Changed" must be notified via the corporate email SSMA.Corp@saas.vale.com so that Vale's Corporate Security can call a Vale Technical Committee to analyze the timeline, the triggering events and the repercussions resulting from this injury. The Vale Technical Committee will be composed of at least 1 doctor representing the second line of defense, a technician responsible for the area in question and a doctor from another business area.

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- The characterization of “Lives Changed” must be completed after evaluation by the Vale technical committee considering the state of health, functional capacity for work or activities of daily living within 180 days after the date of the event or on the date of diagnosis of the occupational disease. Exceptions to the characterization of “Lives Changed”, after 180 days will be justified to the Vale technical committee, which will define a new deadline necessary for the characterization.

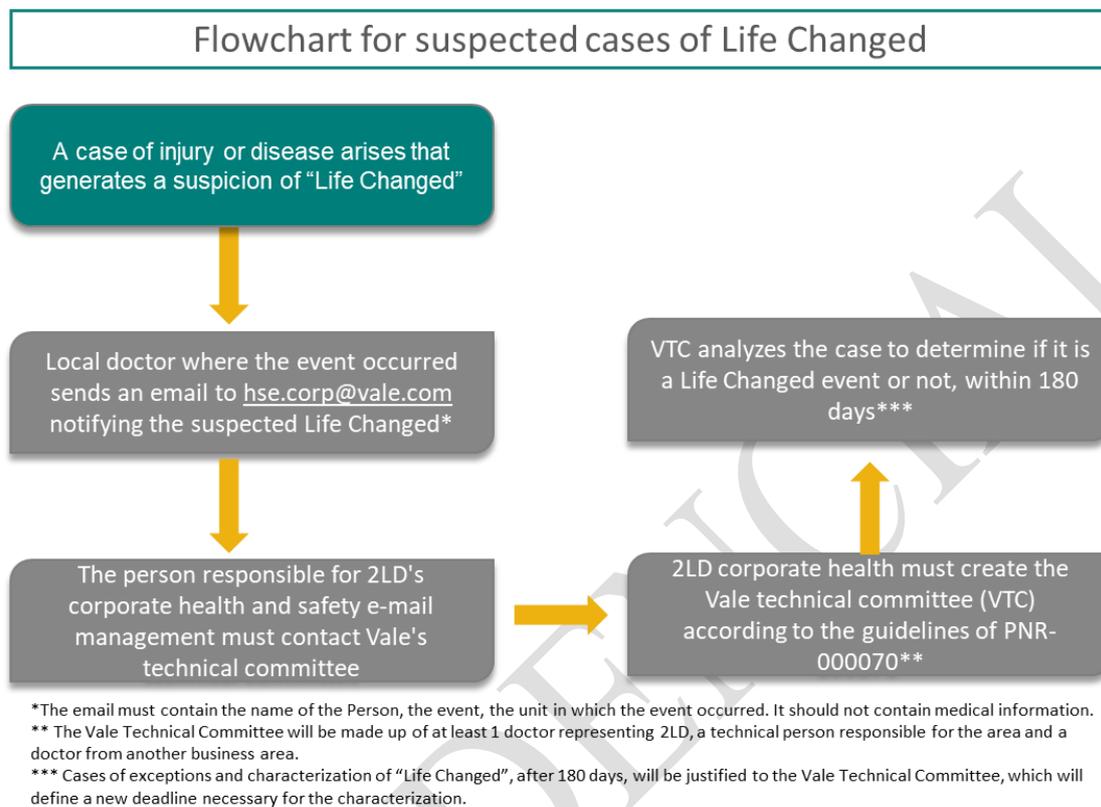


Figure 2 – Flow for suspected Lives Changed

2.3.2 SSO Event Accounting

For accounting purposes and in general, this procedure considers injuries or sequelae with the general characteristics described below to be significant.

- A. Work-related events – associated with immediate and long-term assessments, conducted by doctors, of the effects (injuries) on the original working capacity, total or partial, permanently and that impact activities of daily living or social and family relationships. The following initial parameters must be observed:
- Total and permanent disability.
 - Loss or significant impairment of somatic functions.

A preliminary estimate of loss and maximum medical improvement may be made when applicable to meet Vale's communication deadlines. The estimate must be expressed based on the cutoff point of 32% of total body function to fit the definition of Lives Changed.

The AMA guidelines (Guides to the Evaluation of Permanent Impairment by American Medical Association, Robert D. Rondinelli (Editor), Elizabeth Genovess) should be used as a reference framework and as a technical foundation based on solid medical evidence and duly recognized throughout the world.

A more accurate percentage estimate of disability should be used in the following situations:

1. When percentages are difficult to estimate and are close to 32%.
2. When a more precise or complex estimate is needed, chapter 2 of the AMA guidelines (Guides to the Evaluation of Permanent Impairment by American Medical Association, Robert D. Rondinelli (Editor), Elizabeth Genovess) can be used as guidance in determining ratings of disability. When the evaluating physician cannot perform a direct evaluation, medical information available from attending physicians, medical clinics, or other reliable sources can be used.

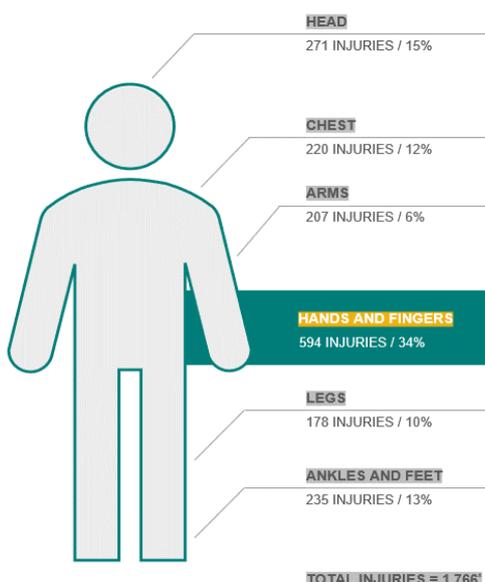
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The table below provides a summary of the most frequent descriptions of injuries occurring in Vale from a perspective of various regions with permanent disability (i.e. loss of an eye and amputation of a limb), disability caused by treatment or rejection of treatment, use of prosthetics or assistive devices, an injury over a pre-existing disability, among others in the Guides to the Evaluation of Permanent Impairment AMA.

Whole person impairment (%)	Description
5	Full loss of ring or little finger
9	25% hearing impairment of both ears
10-29	Mild vision loss
11	Full loss of index or middle finger
18	50% hearing impairment of both ears
26	75% hearing impairment of both ears
28	Maximum impairment for lumbar or thoracic spine injury
26-50	60-69% of predicted post-bronchodilator FEV1, and 20-29% change (reversibility) and daily use of medication for occupational asthma
26-50	51-59% of predicted FVC; or 41-59% of predicted FEV1; or 15-20 mL/kg·min or 4.3-5.7 METS of V _{o2} max for pneumoconiosis
30-49	Moderate vision loss
32	Loss of lower limb at knee
35	Full loss of hearing or voice/speech.
38	Maximum impairment for cervical spine disorders
40	Full loss of lower limb
50-61	Severe vision loss
54	Full loss of hand
60	Full loss of upper limb at shoulder
62-73	Profound vision loss
80+	No use of upper limbs
85	Total vision loss

Source: Guides to the Evaluation of Permanent Impairment by American Medical Association, Robert D. Rondonelli (Editor), Elizabeth Genovaess.

Following an epidemiological survey conducted on all events that occurred in Vale, from January 2020 to December 2022, we found that 15% occurred in areas of the head, 12% in the trunk, 6% in arms, 34% in hands and fingers, 10% on the legs, 13% on the ankles and feet.



Ref.: Jan. 2020 to Dec. 2022
 * Empty = 82 injuries (5%) / Others = 80 (5%)

These accidents may be grouped up by body segment, as per medical literature, as follows:

1. Upper limbs – 40%
2. Lower limbs – 23%
3. Head/Trunk – 27%

Specific classification for upper and lower limbs. For accounting purposes, considering all injuries that occurred from January 2020 to December 2022, we have those related to upper and lower limbs (including amputations and segment losses) specifically. This procedure considers injuries or sequelae with the general characteristics described to the side:

1. Work-related events – associated with immediate and long-term assessments, conducted by doctors, of the effects (injuries) on the original working capacity, total or partial, permanently and that impact activities of daily living or social and family relationships.
2. Total and permanent functional disability.

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The classification of the injury will be based on its permanent and definitive nature, associated with the representation of this loss on the total function of the body and not on the anatomical functionality of the location of the loss, this being quantified at the end in its repercussion in a systemic manner, where we will have the limit equal to or greater than 32%*, as a cut-off percentage between the definition Lives Changed or not. We will use as a reference the tables presented below and described in more detail in the Guides to the Evaluation of Permanent Impairment by the American Medical Association.

To better understand how this classification is used, let's follow a hypothetical example:

Case 1. Individual suffers an injury to the 2.QDD (index finger), with puncture at the level of the medial phalanx. According to the table below, we see that this represents 80% of the function of the finger, which corresponds to 16% of the function of the hand, which corresponds to 14% of the function of the upper limb and 8% of the total body (percentage of interest for definition).

Not classifiable as Lives changed.

Description / Impairment	Finger Function (%)	Hand Function (%)	Upper Limb Function (%)	Total Body Function (%)
Injury of the 2nd QDD of the right hand (index finger) with amputation at the level of the medial phalanx	80	16	14	8
			Conclusion	Not classifiable as Changed Lives

Source: Guides to the Evaluation of Permanent Impairment by American Medical Association, Robert D. Rondinelli (Editor), Elizabeth Genovess

Case 2. Individual suffers an injury to the 1.QDD (thumb), with amputation at the level of the proximal phalanx. According to the table below, we see that this represents 100% of the function of the finger, which corresponds to 40% of the function of the hand, which corresponds to 36% of the function of the upper limb and 22% of the total body (percentage of interest for definition).

Not classifiable as Lives changed.

Description / Impairment	Finger Function (%)	Hand Function (%)	Upper Limb Function (%)	Total Body Function (%)
Injury of the 1st QDD of the right hand (thumb finger) with amputation at the level of the proximal phalanx	100	40	36	22
			Conclusion	Not classifiable as Changed Lives

Source: Guides to the Evaluation of Permanent Impairment by American Medical Association, Robert D. Rondinelli (Editor), Elizabeth Genovess

Case 3. Individual suffers an injury to the hand with amputation of all fingers at the level of the proximal phalanx. According to the table below, we see that this represents 100% of the function of the hand, which corresponds to 90% of the function of the upper limb and 54% of the body total (percentage of interest for definition).

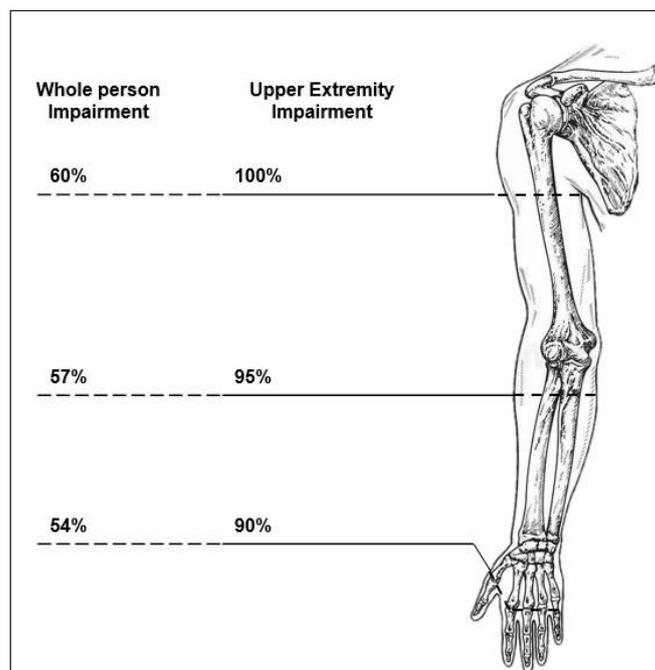
Classifiable as Lives changed.

Description / Impairment	Hand Function (%)	Upper Limb Function (%)	Total Body Function (%)
Injury of the 1st QDD of the right hand (thumb finger) with amputation at the level of the proximal phalanx	100	90	54
		Conclusion	Lives Changed

Source: Guides to the Evaluation of Permanent Impairment by American Medical Association, Robert D. Rondinelli (Editor), Elizabeth Genovess

Amputation Levels	Impairment % of			
	Digit	Hand	Upper Extremity	Whole Person
Scapulothoracic (forequarter)	-	-	-	70
Shoulder disarticulation	-	-	100	60
Arm: deltoid insertion and proximally	-	-	100	60
Arm/forearm: from distal to deltoid insertion to bicipital insertion	-	-	95	57
Forearm/hand: from distal to bicipital insertion to transmetacarpo-phalangeal loss of all digits	-	-	94-90	56-54
Hand: all digits at MP joints	-	100	90	54
Hand: all fingers at MP joints except thumb	-	60	54	32
Thumb ray at/or near: CMC joint Distal third of 1st metacarpal	-	-	38 37	23 22
Thumb at: MP joint IP joint	100 50	40 20	36 18	22 11
Index or middle finger at: MP joint PIP joint DIP joint	100 80 45	20 16 95	18 14 8	11 8 5
Ring or little finger at: MP joint PIP joint DIP joint	100 80 45	10 8 5	9 7 5	5 4 3

Source: Guides to the Evaluation of Permanent Impairment by American Medical Association, Robert D. Rondonelli (Editor), Elizabeth Genovaess.



Source: Guides to the Evaluation of Permanent Impairment by American Medical Association, Robert D. Rondonelli (Editor), Elizabeth Genovaess.

Adding two new parameters for the classification of upper limb injuries, which consider the inclusion of loss of movement or ankylosis generated by injuries as principles to be evaluated as generators of disability.

The percentage of loss of the upper limbs is calculated by the sum of the losses in extension (I_E) and flexion (I_F). If ankylosis occurs, we will use I_A . ($I_E + I_F =$ loss of upper limbs or $I_A =$ loss of upper limbs).

The final total is then compared with the total body loss table for upper limbs, described below:

% Impairment of									
Upper Extremity	Whole Person								
0	0	20	12	40	24	60	36	80	48
1	1	21	13	41	25	61	37	81	49
2	= 1	22	= 13	42	= 25	62	= 37	82	= 49
3	2	23	14	43	26	63	38	83	50
4	2	24	14	44	26	64	38	84	50
5	3	25	15	45	27	65	39	85	51
6	4	26	16	46	28	66	40	86	52
7	= 4	27	= 16	47	= 28	67	= 40	87	= 52
8	5	28	17	48	29	68	41	88	53
9	5	29	17	49	29	69	41	89	53
10	6	30	18	50	30	70	42	90	54
11	7	31	19	51	31	71	43	91	55
12	= 7	32	= 19	52	= 31	72	= 43	92	= 55
13	8	33	20	53	32	73	44	93	56
14	8	34	20	54	32	74	44	94	56
15	9	35	21	55	33	75	45	95	57
16	10	36	22	56	34	76	46	96	58
17	= 10	37	= 22	57	= 34	77	= 46	97	= 58
18	11	38	23	58	35	78	47	98	59
19	11	39	23	59	35	79	47	99	59
								100	= 60

Source: Guides to the Evaluation of Permanent Impairment by American Medical Association, Robert D. Rondonelli (Editor), Elizabeth Genovess.

Source: Guides to the Evaluation of Permanent Impairment by American Medical Association, Robert D. Rondonelli (Editor), Elizabeth Genovess.

E, F, and A indexes of scapulohumeral joint

Calculation example

Case 1

1. Exam: Shoulder flexion to 90 degrees and extension to 0 degrees

Analysis: $I_F = 6\%$ loss of the upper limb.

$I_E = 3\%$ loss in upper limb

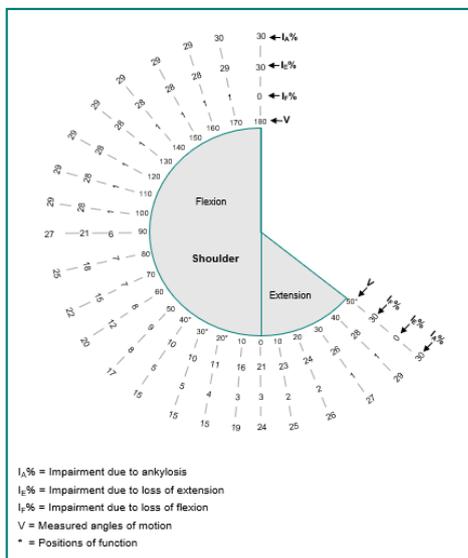
Percentage of loss = $6\% + 3\% = 9\%$ loss in the upper limb

Case 2

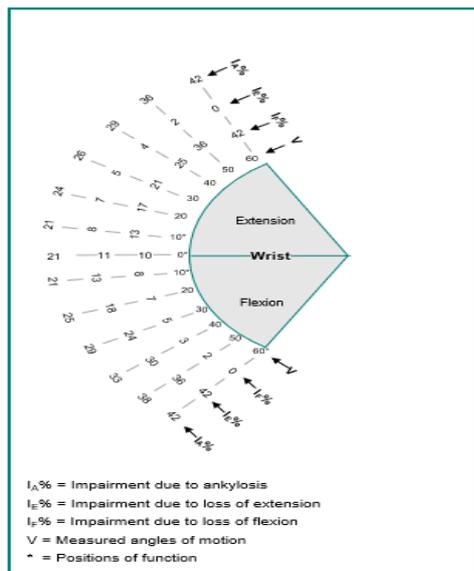
2. Exam: Shoulder ankylosis at 30 degrees of flexion.

Analysis: $I_A = 15\%$

Percentage of loss = 15% loss in the upper limb

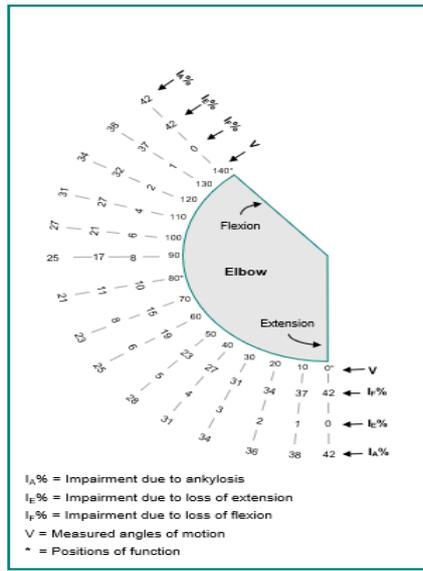


Source: Guides to the Evaluation of Permanent Impairment by American Medical Association, Robert D. Rondonelli (Editor), Elizabeth Genovess.



Source: Guides to the Evaluation of Permanent Impairment by American Medical Association, Robert D. Rondonelli (Editor), Elizabeth Genovess.

E, F, and A indexes of fist joint



Source: Guides to the Evaluation of Permanent Impairment by American Medical Association, Robert D. Rondonelli (Editor), Elizabeth Genovess.

E, F, and A indexes of elbow joint

For lower limbs (LL), we followed the same technical methodology demonstrated for upper limbs, following a specific table for this anatomical segment, shown below.

Amputation	Whole Person (Lower Extremity) [Foot] Impairment (%)		
Hemipelvectomy	50		
Hip disarticulation	40	(100)	
Above knee: Proximal	40	(100)	
Midhigh	36	(90)	
Distal	32	(80)	
Knee disarticulation	32	(80)	
Below knee: Less than 3"	32	(80)	
3" or more	28	(70)	
Syme (hindfoot)	25	(62)	[100]
Midfoot	18	(45)	[64]
Transmetatarsal	16	(40)	[57]
First metatarsal	8	(20)	[28]
Other metatarsal	2	(5)	[7]
All toes at metatarsophalangeal (MTP) joint	9	(22)	[31]
Great toe at MTP joint	5	(12)	[17]
Great toe at interphalangeal joint	2	(5)	[7]
Lesser toes at MTP joint	1	(2)	[3] each

Source: Guides to the Evaluation of Permanent Impairment by American Medical Association, Robert D. Rondinelli (Editor), Elizabeth Genovess.

Whole Person (Lower Extremity) [Foot] Impairment (%)				
Cartilage Interval				
Joint	3 mm	2 mm	1 mm	0 mm
Sacroiliac (3 mm)*	-	1 (2)	3 (7)	3 (7)
Hip (4 mm)	3 (7)	8 (20)	10 (25)	20 (50)
Knee (4 mm)	3 (7)	8 (20)	10 (25)	20 (50)
Patellofemoral**	-	4 (10)	6 (15)	8 (20)
Ankle (4 mm)	2 (5) [7]	6 (15) [21]	8 (20) [28]	12 (30) [43]
Subtalar (3 mm)	-	2 (5) [7]	6 (15) [21]	10 (25) [35]
Talonavicular (2-3 mm)	-	-	4 (10) [14]	8 (20) [28]
Calcaneocuboid	-	-	4 (10) [14]	8 (20) [28]
First metatarsophalangeal	-	-	2 (5) [7]	5 (12) [17]
Other metatarsophalangeal	-	-	1 (2) [3]	3 (7) [10]

*Normal cartilage ranges are shown in parentheses.

** In an individual with a history of direct trauma, complaining of patellofemoral pain and crepitus on physical examination, but without joint space narrowing on x-rays, an impairment of 2% for the entire person or 5% for the lower extremity is considered.

Source: *Guides to the Evaluation of Permanent Impairment by American Medical Association, Robert D. Roudinelli (Editor), Elizabeth Genovess.*

Discrepancy (cm)	Whole Person (Lower Extremity) Impairment (%)
0 - 1.9	0
2 - 2.9	2 - 3 (5 - 9)
3 - 3.9	4 - 5 (10 - 14)
4 - 4.9	6 - 7 (15 - 19)
5+	8 (20)

Source: *Guides to the Evaluation of Permanent Impairment by American Medical Association, Robert D. Roudinelli (Editor), Elizabeth Genovess.*

Lower Limbs also adding two new parameters, the resulting lower limb discrepancy and the ankylosis generated by the injury (decrease in joint space), as principles to be evaluated as generating disability.

When an estimate needs to be more refined or raises questions because it is borderline, Chapter 17 of the AMA guidelines should be used as guidance in determining deficiency ratings.

When the evaluating physician cannot perform a direct evaluation, medical information available from attending physicians, medical clinics, or other reliable sources can be used.

Note: Bilateral injuries are accounted for by adding the two percentages quantified independently of each other.

2.3.3 General Provisions

- Questions, comments and suggestions related to this document should be sent to the Health, Safety and Operational Risks Department via email at SSMA.Corp@saas.vale.com.