

# Prevention campaign for hand injuries in **CHILDREN**





## NATIONAL PREVENTION CAMPAIGN FOR HAND INJURIES IN CHILDREN

In recent years international legislation has paid close attention to work related accidents prevention. For both adults and above all children the main source of accidents is still represented by those that we would think as protected environments, which represent significant accidents source, both in terms of quantity and severity (houses, schools, oratories, sports and recreational activities). The behavioral guidelines and awareness of risk factors for children, that have been drawn from the clinical and territorial professional experience, and that are contained and transmitted in this site, are not born only to be collected in a container that can be accessed, but they have preferred a less pyramidal, more engaging and attractive model of communication to families and the children themselves, by means of comics and simple languages. This work has also been supported by a highly decentralized information program in the different territories, with the direct engagement of professional hand surgeons to communicate and present this project and its results directly in school, parochial and sports worlds.

The families, children and operators involvement has as a secondary endpoint: to switch from one merely informative model to a training one, that changes the recipients of the educational message into real protagonist and no longer simple user. They must be conscious and sharing a model of health, treatment and prevention in which health is recognized as a prerequisite and concurrent basis of individual freedom and self determination.

The modern medicine, after all, does not end with the treatment, but it is developed to shorten “academic” distances with citizens (not just patients), it embodies a sociocultural training role, widening to health protection with individual empowerment, starting from a mindset of health care education and primary prevention.

The system’s efficiency and effectiveness are key to the sustainability of the same. Solidarity and trust have to go hand in hand in order to ensure that financing properly matches and supports functioning of a new system where Public institutions shed their authoritarian traits so to adhere to a whole new standard of positive and reliable endorsement. The ultimate aim is, in fact, to literally transform the position and role of the recipient from a passive “target” into an active and fully aware subject actively contributing to her own personal health as well as to the public one.

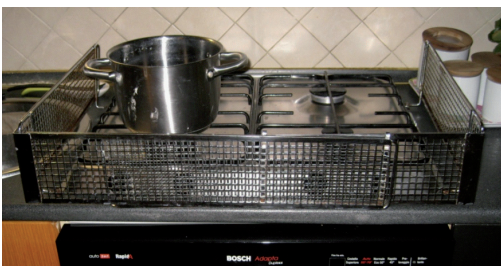
# at HOME HAIR-DRYER

The rear ventilation fan of the hair-dryer is a dangerous element if the protection systems are not preserved. Among youngest children, whose fingers may be more successful in penetrating the ventilation mesh, direct traumatism involving the fingertips are very typical, ranging from tears to possible sub-amputation. In the most recent hair-dryer generation it has been paid attention to fan protection. These hair dryers are equipped with multiple protection masks and parallel vanes fan(A) and that results in having a less amputative mechanism of injury.



## the KITCHEN

The domestic environment is far from being the most reliable place for the safety of the child (as well as adult!). The majority of injuries happens at home and are not always low energy injuries. In evolutionary pedagogy field the educational model points out that for children from 3 to 11 years is necessary knowing the children evolution, to help and protect them during their growth. From 3 to 5 years, for the child, the outside world is different and stranger to him, and the things become “objects”. However properties and physical laws of things do not rule the children behavior, but the interest and the expectation of child move him toward reality; so the danger is very high. From 6 to 9 years, analytical thinking makes the child more aware of the dangers. At this stage the educator must involve him in household chores with rules and orders so as to promote the emergence of the feeling of “his duty” and to develop the social adaptation and the acquired knowledge. The aim is giving confidence in his abilities. Teaching children to cooperate with parents to household chores, such as set and clear the table, should nevertheless provide measures to handle plastic tableware and avoid the transport of glass and ceramics.



Always ensure that there are adequate and stable stove guards to prevent children to reach or to mobilize pots and hot liquids.

### at HOME

Hairdryer fan,  
Cookers and tableware,  
Drawers and cabinets,  
Doors and car doors,  
Fingertip crushing (nail hematoma drainage),  
Make the bed (baseball finger),  
Burns,  
Gym bikes and treadmill,  
Sliding loader at the cash of supermarkets and escalator's handrail,  
Elevators,  
Grinders and blenders.

### at SCHOOL

Scissors and drawing compasses,  
Splinters from wooden desks and propelling pencil,  
Ring injuries.

### during SPORT and TIME GAMES

All the sports with a ball,  
Swimming pool (lanes and outflow implants),  
Bicycle chains and scooters,  
Chutes and Swings,  
Ice skates.

### the ENVIRONMENT

At the beach,  
at the seaside,  
Fishing hooks,  
Deck chairs,  
Animal bites,  
Firecrackers.

### the BEHAVIOURS

Dermatological lesions spread from community life.  
Trichotillomania.  
Nail biting.  
Neuropsychiatric childhood disabilities

Crushings of the fingers are extremely frequent accidental events, especially making the bed and putting in place pillows and blankets. Involving mainly the fingertips, drainage of any **subungual hematomas** is necessary, even in the absence of fractures, because of the acute pain, caused by hematoma during the next 12-24 hours.

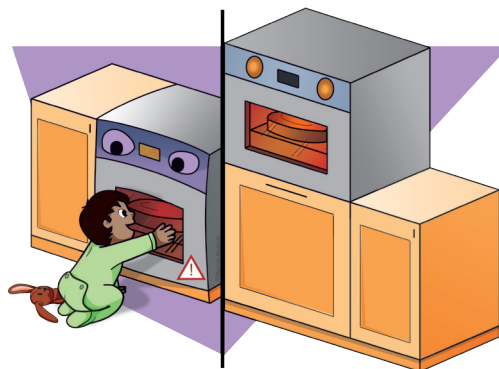
The same degree of attention has to be paid in different environments like **refrigerator doors of supermarkets** and **car doors** which have a very harmful metallic edge.

*The prevention and information are the only effective ways to reduce the risks of burn injuries in childhood through routine compartments:*

- Control water temperature before bathrooms
- Interpose physical barriers to the edge of the stove
- Cover or keep out of the reach of the children the glass of the oven
- Remove matches or lighters and keep out of reach of children
- Use smoke detectors in the home environment
- Use fire-resistant clothing (pajamas, shirts...)
- Teach the children as soon as possible that fire is an enemy from which to steer clear

## *the BURN WOUNDS*

The burn wounds are the third most common cause of traumatism in pediatric patients after car accidents and accidents of drowning. Often they require admission to the hospital, long stay hospitalization and long-term treatment over time. Considerable importance is the personal impact of the lesion on the child and the family, from the aesthetic as well as the functional point of view. The hand is equipped with complex articulation, functionality and proprioception, so that injuries like burn wounds may result in physical and psychological disabilities and it is also expected they persist and worsen their impact in subsequent years. Burn wounds from **hot liquids** (water, baby bottles, soup...) are the most frequent (61%) followed by those which are caused by direct body contact with **hot surfaces** (iron, domestic oven, cooking rings...) (20%), from open flame (fire fanned with flammable liquids) (8%), flushing (7%), chemicals (2%) and electrical (1%).



The station of the oven should be lifted out of the reach of children.



# *GYM BIKES* and domestic sports equipment

The chains of gym bikes are the largest and most dangerous source of fingertips lesions of the children in the house. It's important to prefer the last generation of gym bikes that are equipped with retractable and adequately protected chains. Crushing injuries and wounds can be caused by running treadmill and the same degree of attention should be placed to mechanisms like sliding loader at the cash of supermarkets and handrail escalators.



# *GRINDERS* and *BLENDERS*



Not only in the kitchen the degree of attention may drop dangerously while using meat grinders and blenders, but the economic difficulties of free trade and modern times make more and more frequent the need to take the children in working environments, with **high risks of direct contact with high harmfulness and destructive equipments**. In this working environment it can happen to expose children to the same risks of the parents with a huge increased risk, linked to their unawareness and their spirit of emulation and curiosity. Inside home, it is

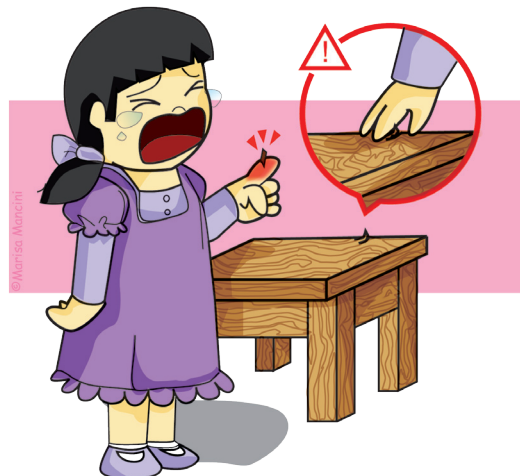
fundamental the respect for the integrity of the safety precautions; they are usually reported in equipment maintenance and operation booklets. The blenders have significant safety margins when they are used with provided shell. They have never to be left unattended and the use of whips should be kept to the necessary, because they are more exposed to sudden gestures of children. Any easy use is not a gain time to perform the task, but it will certainly increase the risks to themselves and their children...

**EVERY MOMENT...CAN BE FOREVER.**

## at SCHOOL

Pointed **scissors** should always be avoided as well as sharp and very long blades, opener and cutter are absolutely contraindicated. The **compass** is a device for drawing and it is contraindicated in children under the age of 6-7 years because its tip, albeit small, is sufficient to cause injury to the deep flexor of the finger of the hand.

It is really important a proper **maintenance of the desks**, particularly exposed to the risk of wood splinters penetration, and it is recommended the use of not too sharp pencils that may result in puncture wounds with granulomas caused by retained pencil mines.



As in adults, the use of rings in children constitutes an element of increased risk. During sports, gymnastic hour at school or playtime, children have to take off any form of ring and bracelet in order to avoid that these may engage in nets, hooks, clothes and ornaments of other comrades, causing a degloving or amputation from stripping of the fingers, if we talk about rings, or bruises if we talk about bracelets. And **it is necessary and advisable, therefore, do not wear rings and bracelets during play activities and sports.** It is always recommended wearing **open rings and thin bracelets that can break or can open and expand in the event of engagement.**

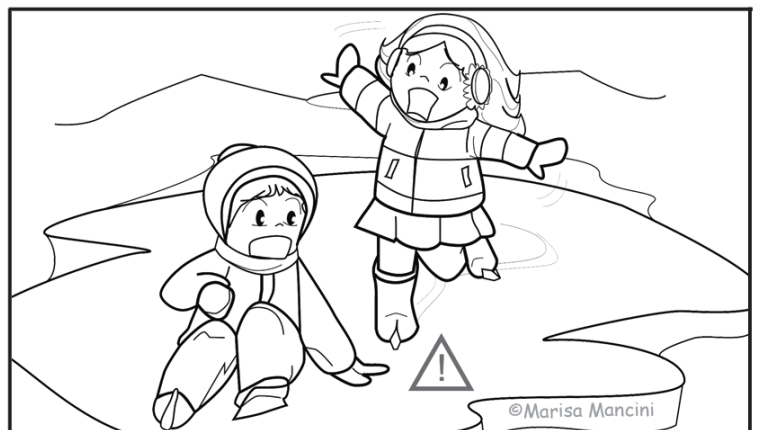
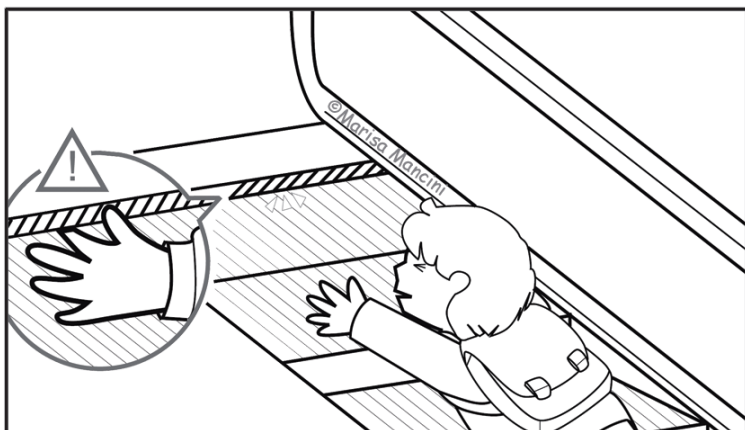
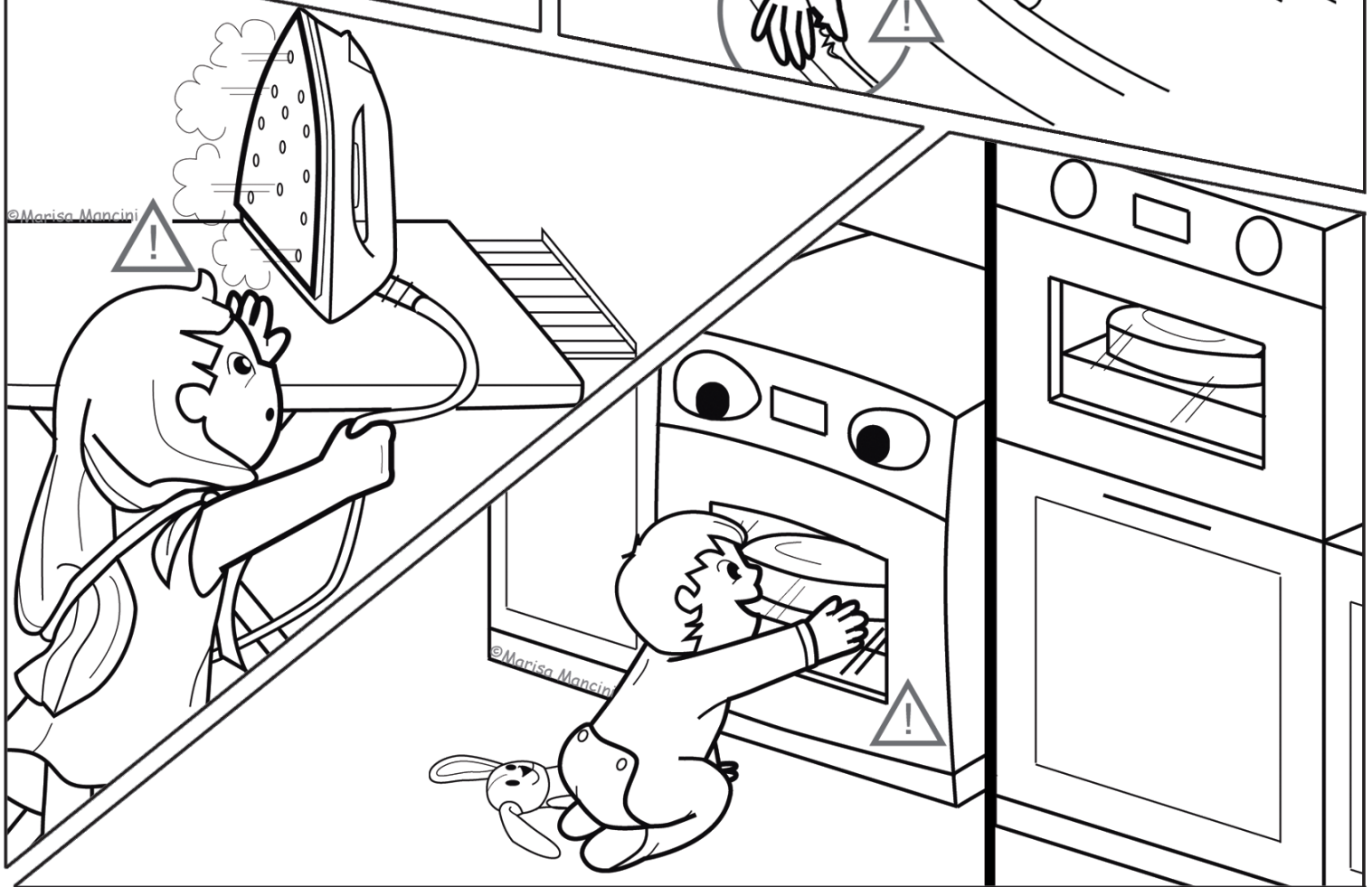
**NO**



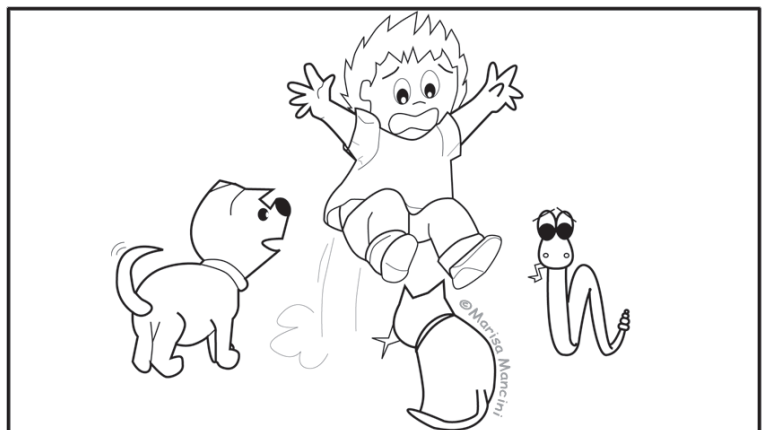
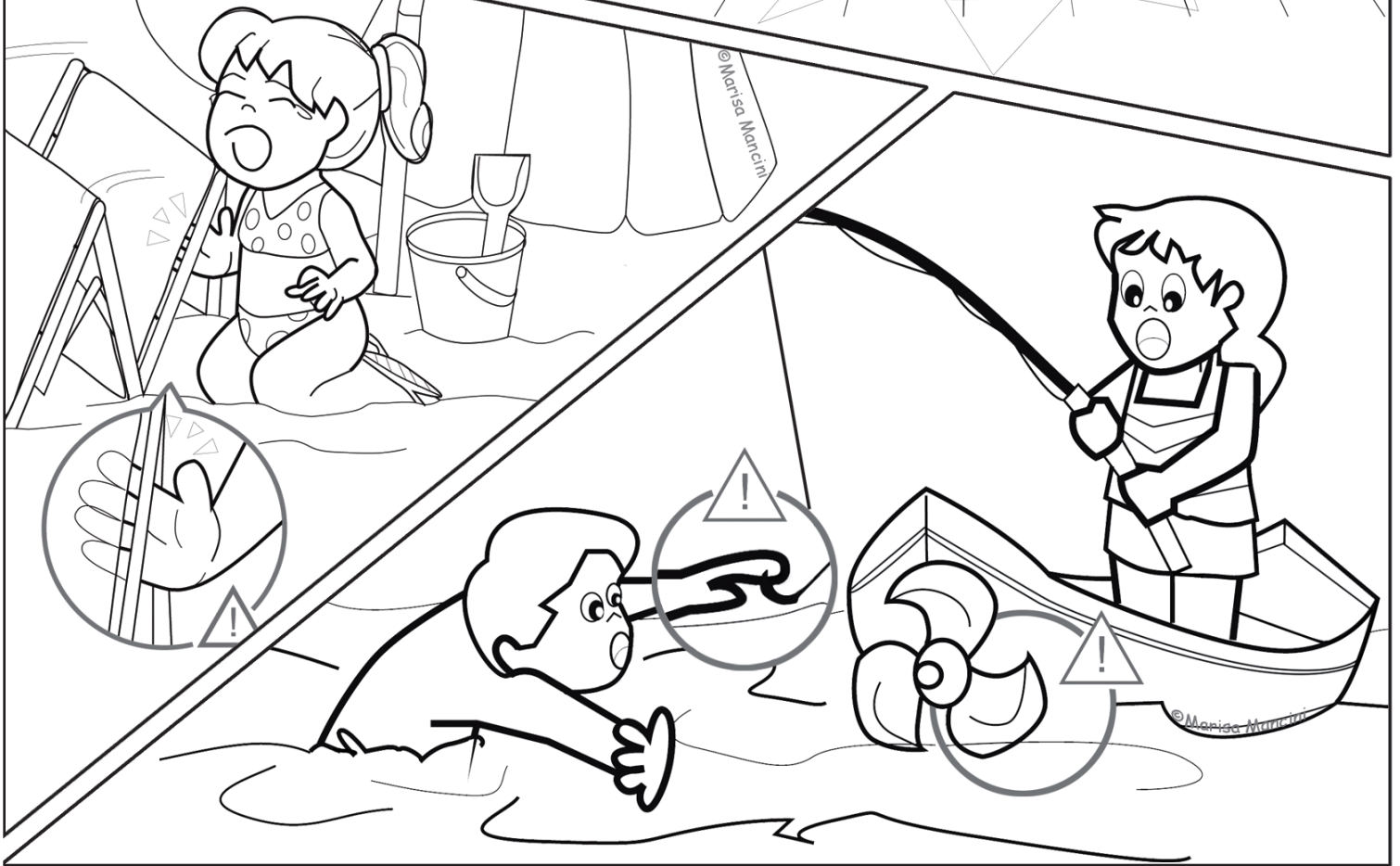
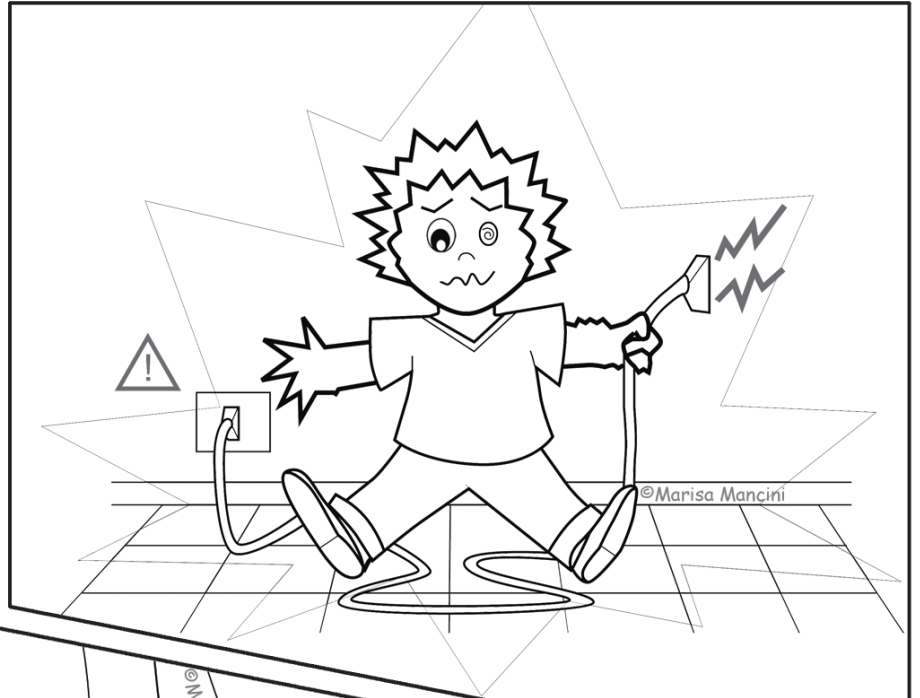
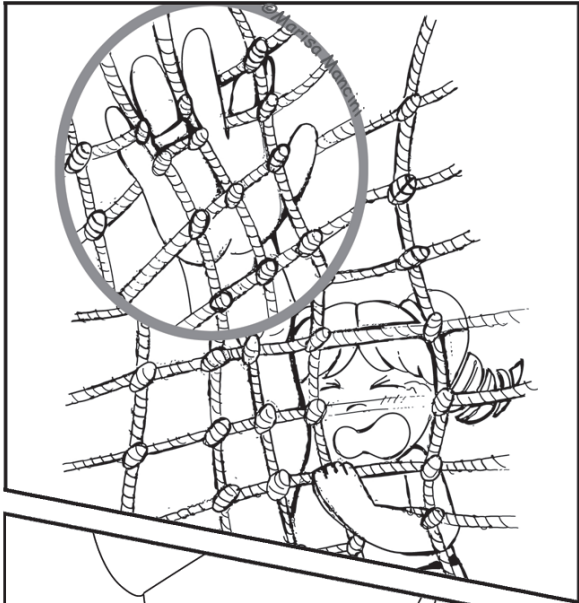
**YES**



**In the case of trauma to a hand, if the child brings rings, it is necessary to remove them immediately before fingers swelling, otherwise that makes no longer possible to remove them, then causing suffering for the vascular block.** Even when the child, slips circular elements (mechanical nuts) immediate swelling prevents the removal and the circulation of the finger.







## Keep out of reach cleaning caustic products

The Soda and Caustic Potash, the sodium or potassium Carbonate, and Ammonia are **caustic alkalis**, while muriatic Acid, the Vitriol, the Varechina, Turpentine and Descaling Health are **corrosive acids**.

**Herbicides** and **Insecticides** are easily absorbed through the skin resulting in risk of poisoning.

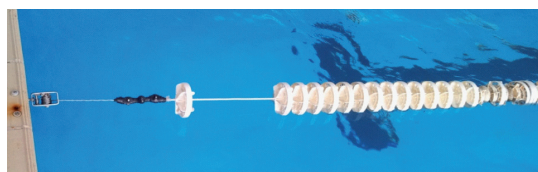
In the event of skin contact with toxic or caustic:

- Immediately remove all contaminated clothing.
- Wash with running water.
- In case of a wide skin contact with toxic products, check the risk of poisoning by absorption referring to the Territorial Reference Poison Centre.

# SPORT

The swimming pool is not a risk factor only for falls in a wet and humid environment. Less well-known risk factors for hands injury are represented by improper maintenance of the lanes. Their plastic elements, especially if chipped, cause injuries during crawl or butterfly style with typical lesions of the space between thumb and index. A better **protection has to be placed to the metal bracket**. For the youngest children it is necessary to protect water drainage containers by means of grids, as children can easily put their hands and forearms and get stuck.

The intervention of the firemen can take several hours of work with risk for hypothermia from prolonged immersion as well as direct damage to the upper limb.



The **volleyball and ball** sports are the predominant risks for direct trauma to the fingers. Where it is possible, like in football for the goalkeeper, the child has always to use appropriate and planned protections and has not to play with bare hands into the goal.

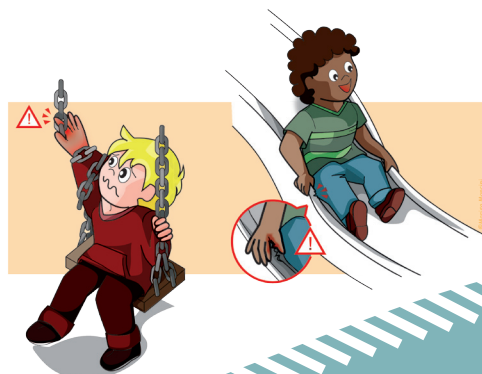
In particular in **volleyball** the coaches have to pay careful attention to the techniques of impact and contact with the ball during the basic training of the boys. Taping and functional protection to the fingers are very useful. In **young climbers** pulleys tendon and osteochondral cores of the fingers are very typical lesions.

In these cases, protections with taping and with elastic rings are very useful. But especially, among the youngest, it has to be avoided arcuate graspings and the use of stressful training structures (Pan Gullich). The skier's thumb lesion is very typical among the skiing injuries, and that can be avoided by use of ergonomic and security handles. Besides we should not forget the possible injury from the practice of **snow board**: it is important to recommend the use of wrist guards, which should be feasible also in the practice of **skateboarding** and **ice skating** and in that of road or track skating. In ice skating hands should always be protected by means of gloves to avoid deep cutting injuries. In horseriding are not rare lesion caused by the reins: even here is better wearing gloves.



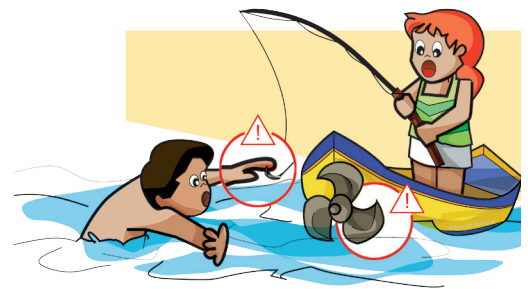
## *at the PARK*

An accident out of five is caused by a DROP. These are difficult to prevent. It is better to check the presence of normal floor in the games of the park, so that it is reduced the energy of the fall. Likewise, great attention must be paid to the maintenance of the games and their correct use. Irregularities and damage to the railing chute represent risk factors for deep wounds, with nerve and tendon injuries of the fingers of the child who comes down with great speed. We should never screw the support chains that can trap fingers and hands, with particularly severe injuries and bony avulsions.



## at the SEA

In case of accidental insertion of fishing hooks in the hands and fingers, the needle removal has not to be done by retrograde extraction. The tip of the hook is specially designed to prevent the unhooking of the fish after the catching, and thus this kind of manouvre is extremely detrimental as well as painful. It can worsen the tissues damage caused by the hooking. Therefore it is necessary to complete the hook race by taking it out from the skin, in order to cut off the tip and to be able to remove it coming back with the residual metal body.



**What to do if you are stung by Tracina since its toxin is thermolabile:**

- AT ONCE IMMERSION IN VERY HOT WATER (45°) FOR 30 minutes AT LEAST
- At once give antibiotic therapy, anti-inflammatory therapy, check vaccination against tetanus
- Keep an eye on the limb swelling to prevent compartment syndrome and if it is going to occur it is necessary to undergo surgery

The deck chairs and sun loungers on the beach, are the most frequent causes of dangerous injuries to the fingers for both children and adults. Do not let the children manipulate the back of the couch or chair and in particular ensure that the locking pin of the back of the couch is well positioned and that it does not mobilize suddenly because it has been badly stuck.

The marine environment has low risks in the European coasts and in particular the Italian ones. Among these, the most significant injuries come from contact with **Jellyfishes** and Tracina stings, especially in the Sardinian and Adriatic coasts. The risks of injury from sharp **corals** are very poor. The **Tracina** (*Trachinus Draco*) is hidden beneath the sandy bottoms, protruding only by eyes and poisonous spines and waiting for prey. The puncture and contact with his poison, in particular for small children's hands, create an immediate intense pain and rapidly localized swelling and erythema. Equally its sting can result in hypotensive phenomena, tachycardic and reactions to poison. Children playing in the water and on the shore are the most exposed, mainly to the hands, since the feet are enough well protected by shoes during walks and swimming.

# ANIMAL BITES

A people out of two in life is bitten by an animal. If this is a mammal it is the bite of a dog in 80-85%, a cat 5-10%, a rodent in 2-3%, a human in 2-3%. The **dog** bite injury affects mainly hands and if the dog is of a large size over the wound can be even fractures. The **cat** causes deep and penetrating wounds, but over the bite there may be claw injuries, complicated by the “cat scratch disease” (Pathogen Bartonella). The **rodents** lesions, mostly in the hands, happen at night in degraded environments. Other responsible mammals are horses, pigs and sheep. In a domestic environment is not rare being bitten by hamsters and ferrets. It is rare being bitten by bat. All mammalian bites can become infected so it is recommended prophylactic antibiotics and tetanus. (ASL offices are responsible for the anti-rabies).

**Prevention:** do not approach unknown animals, do not let the children give too much confidence to the animal, use muzzles and leashes (the accidents are more frequent inside home where such precautions are neglected), do not get close to the dog that eats, do not challenge the animal staring in the eye.

In the **dog** bites, prevention is **totally in good civic education and masters behavior**. The legislation are already full and adequate. Attention to the means of protection to prevent bites in public places, as required by law (and short muzzles and resistant leashes) and attention to protect the grates of the villas with networks that prevent the dog’s teeth to protrude or the hands of the children to slip between the bars.



The **Viper** has spread from Central Italy and southern regions up Tuscan-Emilian Apennines.

It is a sedentary and very shy reptile, that lives mostly hidden and it becomes dangerous only when we stumble upon it directly and by closing escape routes, while it warms up the sun or feeds. It is out, in fact, during hot and humid days between

15° and 35° (careful to rocks exposed to the sun, bundles of wood, tree trunks, dry stone walls, barns, streams, ponds).

Given the defensive attitude of the reptile, it is often enough to remove him or that we report our movement and our arrival by hitting the ground and the thorns with a stick and do not stretch your hands imprudently. In the event of a bite to hands, the small and irregular surface, makes it difficult to detect the typical bite mark, with two main holes spaced about 1 cm apart and two lines of the jaw footprints.

Often the hole is single and surrounded by erythematous halo with rapid onset of important swelling and spread to the upper limb in children.

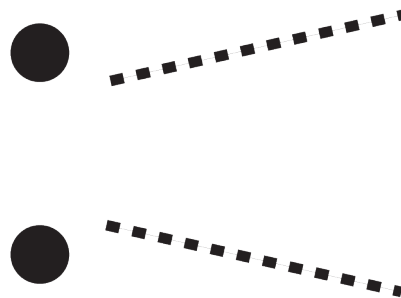
The pain is intense and systemic symptoms may follow in a few tens of minutes with malaise, hypotension, and vomiting. From the report of the territorial USL only 1% of people, bitten by direct poisoning, is deceased (about one death a year in Italy). However, among all the subjects, children

between 6-8 years are at greater risk of suffering both local and systemic damages. In the 20-30% of cases

### WHAT TO DO IN EVENT OF SNAKE'S BITE ?

- CALM DOWN BE AWARE of the very low rate of mortality
- MAKE ELASTIC BANDAGE, slightly compressive, centrifugal, upstream of the wound NOT TIGHTEN THE LIMB WITH LACES, resulting in vascular risk
- REMOVE RINGS AND BRACELETS STRAIGHTAWAY for the rapid and increasing swelling at the onset
- not disinfect
- not put ice on the wound
- NOT AFFEKT AND NOT SUCK
- immobilize limb to reduce blood circle
- IF YOU NEED SERUM HAS TO BE GIVEN JUST IN THE HOSPITAL
- Tetanus Vaccination is presumed active in children, but it is always best to check with parents if the vaccinations have been done correctly

the bites do not lead to inoculation of the poison or they occurs to a small extent, actually the viper prefers the pressing of the venom glands just in case of assault for nutrition and not for a defensive purpose. The hands, like the legs, are exposed to a lower risk, being more distant from the central bloodstream.



## *the FIRECRACKERS*

The careless and inappropriate use of firecrackers can cause severe injuries especially in the hands, and very often such injuries affect children (Firework injuries: An epidemiological survey in Naples, M & B No. 1, 35-39, 1998).

The victims budget of the New Year 2013, according to the Public Safety Department of the Interior Ministry, is two dead and 361 injured. Among the wounded, 53 have less than 12 years (compared to 76 of the last year) and 39 between 13 and 18 years.

The total ( 92) is lower compared to that of the last year (135). The number of the wounded people was greatly reduced. In 2012 the total was 561.

The wounded with prognosis less than 40 days were 29, compared to 35 of the last year. The reduction of the victims is linked to an increasingly active prevention campaign and to a growing fight of the police towards illegal firecrackers. Despite the gradually improving trend, it is very important to maintain an information and injuries prevention campaign.

THERE ARE NOT SAFE FIREWORKS, although some of those are authorized for sale. Even the stars that children use with ease burn at 300° and can cause burns and fire. If you really do not want to give up, you should follow the rules: only buy fireworks which are allowed on the package and which will

bring the label with the Ministerial Decree number, do not leave children alone during the use of fireworks, firecrackers and do not modify the fireworks and do not pack fireworks craft; light fires always outdoors and away from houses, cars and other fireworks, keep them far from your eyes and face, in case of fireworks that do not work or are unexploded NEVER TRY TO reignite; NOT TRY TO TURN ON THE FIREWORKS FOUND BY CHANCE ON THE GROUND, NOT TRY TO RECOVER THE EXPLOSIVE MIXTURE FROM UNEXPLODED FIRES never switch on the firecrackers in glass or metal containers, that can shatter scattering splinters.



## *the BEHAVIOURS*

**Trichotillomania** is a condition of neuropsychiatric children that has extremely dangerous implications in the field of otorhinolaryngology, but also the simple and repeated habit of playing with their hair before sleeping can lead to force the finger into real laces that during night can prevent the normal circulation of the blood. In the life of the sporting community and school where the kids have attitudes, strongly **characterized by direct and close contact**, attention should be paid to affections or infections which can be aroused by contact with nature, such as erysipelas and mycosis.

In young patients with **disabilities**, the frequent use of functional braces or the use of braces in the post-intervention results often in hand injuries related to pressure sores. These may be due to excessive force, to a bad design of the brace or to a mal positioning of the pads or of the Velcro closure.

It is necessary a close surveillance and monitoring in order to avoid deep injuries which can be very frequent for the lack of sensation in these pathologies. It is useful the use of talc and zinc creams to prevent maceration skin. If you detect redness or small skin lesions go to your doctor as soon as possible.

Finally, attention to prams. There may be injuries caused by the spokes of the wheels: it is recommended the use of lenticular wheels.

The nail biting is a compulsive disorder that leads to eat their own nails and cuticles.

It involves in particular the children (30% of cases) and adolescents (45%). In these, you have often infections arisen from the eponichio and/or perinichio (as whitlow) because of local bacterial carried by germs in the mouth.

[www.manisicure.eu](http://www.manisicure.eu)

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