

## **Nicotine Poisoning in Children**

### **Background Information**

Nicotine has been a known cause of poisoning injuries in children for many years. Children aged between 0-5 years are predominantly affected and historically, the main cause of nicotine poisoning has been via ingestion of cigarette butts and/or cigarettes.

However, it appears that this trend is changing and countries across Europe as well as America, New Zealand and Australia have all reported rises in the number of nicotine poisoning incidents involving nicotine replacement therapies (NRTs). These include patches, gum, lozenges and liquid nicotine (usually used in e-cigarettes).

The cause of this changing trend is not known, however, the following factors may have influenced the increase of NRT poisoning:

- Change in smoking legislation
- Increased smoking cessation campaigns
- Increased use of NRTs
- Cost of cigarettes
- Increased use of e-cigarettes

Whilst many countries are seeing a decrease in the numbers of smokers, they are still recording an increase in the total number of children experiencing nicotine poisoning. Reasons for this are unclear, but injury experts believe that NRTs are more likely to be ingested by young children as they are more accessible, attractive, easier to swallow in quantity, chew and 'play with' than traditional cigarettes. It could also be assumed that parents may be unaware of the dangers of NRTs to children.

### **Toxicity & Symptoms of Nicotine Poisoning**

Using TOXBASE, the primary UK clinical toxicology database, the National Poisons Information Unit has provided the following information on nicotine poisoning

#### **Toxicity**

- Highly toxic by ingestion, inhalation and skin contact
- Fatal estimated dose is 40 mg of nicotine per adult (average male adult is 73kg). Fatal estimated dose for children is 1mg/1kg. In an average 2 year old (13kg), 13 mg of nicotine is cited as being fatal. This equates to approximately 3 x 4mg pieces of nicotine gum.
- If more than 0.2 mg/kg of nicotine has been ingested, then medical attention is advised.
- Children who have ingested any amount of an un-smoked cigarette or 2 or more smoked cigarette butts should seek medical attention

## Symptoms

- Burning in the mouth and throat
- Vomiting and nausea
- Confusion
- Dizziness
- Weakness
- Tachycardia and arrhythmias
- Hypertension
- Coma
- Convulsions
- Cardiac arrest

## Case Examples

Childhood nicotine poisonings are a common occurrence in the majority of countries and below are case examples from around the world. Case examples from Wales are not available, but it is highly likely that the causes and methods of poisonings are the same as the ones experienced in other countries.

### a) NRT: Patches

Northern Ireland: 11 year old boy taken to hospital by ambulance after collapsing. He was suffering from nausea, vomiting, headaches and palpitations. On examination, his skin was cold and clammy and a nicotine patch was found on his upper arm. Investigations stated that the patches belonged to his mother who was under treatment for smoking cessation. The first patch had been applied the previous night and the second just hours before his attendance at A&E.<sup>1</sup>

USA: Reports were received of 36 exposures of patches to children under 16 years (mean age 3 years old). Of these exposures 18 were dermal and the remaining children had either; bitten, chewed or swallowed part of a patch. 39% of the children developed symptoms, including nausea, vomiting, diarrhoea, abdominal pain, weakness and dizziness.<sup>2</sup>

### b) NRT: Liquid nicotine

Israel: A 30 month old girl died after ingesting liquid nicotine from her grandparent's electronic cigarette. The girl was being looked after by her grandparents. On arrival at hospital, the girl was found to be in an altered mental state. Her condition deteriorated rapidly and she died the same evening.<sup>3</sup>

### c) NRT: Lozenges

USA: 22 month old boy ingested between 1-1½ lozenges belonging to his father. The lozenges contained 4mg each of nicotine. The boy immediately developed symptoms including cardiac arrhythmia, lethargy, vomiting and drooling. He was taken to hospital, treated and recovered. The lozenges had been stored on top of a cabinet, but still managed to be accessed by the young child.<sup>4</sup>

## **Recommendations for poisoning prevention advice**

### **Practitioners:**

- Inform those working with children and families about the dangers of nicotine products and how to store them safely
- Ensure all smoking cessation programmes include poisoning prevention advice, regardless of participant's age
- Inform pharmacists and other suppliers of the dangers of nicotine products
- Ensure parents and carers are aware of the dangers of nicotine products and are given advice about safe usage and storage
- Information should be given to parents both in group sessions and on a one-to-one basis.

### **Essential Information and advice for parents:**

- **Nicotine is highly poisonous to children**
- **Keep patches, gum, spray, lozenges, e-cigarettes and cigarettes out of sight and out of reach of children**
- **Do not use nicotine products in front of children**
- **Store them in a high kitchen cupboard and use a cupboard lock**
- **Keep handbags out of reach**
- **Used patches should be folded in half and thrown away in the main kitchen bins**

### **Additional information and advice for parents and practitioners**

- Children will explore their surroundings by touching and tasting. Keep all nicotine products, including cigarettes and ashtrays, out of sight and out of reach.
- Children learn by copying adults. Make sure that you do not use any nicotine products in front of children. This includes taking lozenges and using patches.
- To a child, a nicotine patch will look like a plaster and a lozenge will look like a sweet. Keep them away from children.
- Children have been poisoned by used nicotine patches. Throw all used nicotine products into the main kitchen bin and NOT the bathroom bin. Children are less likely to explore the kitchen bin.
- If your handbag contains nicotine products, always keep it out of reach.
- Children commonly eat cigarettes and used butts. Keep them away from children.
- Grandparents, other family members and carers may also use nicotine products. Share this safety information with them.
- If your child has taken or used any nicotine products, seek medical advice immediately.
- All nicotine products are poisonous to children. Treat them as such and keep them stored safely away from children at all times.



## References

1. *Can transdermal nicotine patch cause acute intoxication in a child? The Ulster Medical Journal, Volume 73, No 1, pp.65-66, May 2004*
2. *Childhood poisoning involving transdermal nicotine patches. Pediatrics 1997 May; 99 (5)E4.*
3. *Israeli news reports 29 May 2013. See [www.timesofisrael.com](http://www.timesofisrael.com)*
4. *Incident report to USA Consumer Products Safety Commission. Incident reported in December 2011. [www.saferproducts.gov/viewincident/1221424](http://www.saferproducts.gov/viewincident/1221424)*

**If you would like further information, advice or guidance on nicotine poisoning or how to disseminate information to parenting groups, please contact:**

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