

## School-Issued Musical Instruments: A Significant Source of Nickel Exposure

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### Précis

Budget cuts in American public schools are affecting the availability of music programs and the safety of the available musical instruments. Awareness and avoidance of nickel-containing instruments may help prevent nickel sensitization.

### Discussion

One of the best-recognized risk factors for developing nickel allergy is exposure at an early age.<sup>1</sup> We are repeatedly seeing a very high prevalence of nickel sensitization in our pediatric population; specifically, 41 (33%) of the most recent 125 patients we patch-tested had relevant reactions. We continue to find clinical relevance in items ranging from clothing snaps to toys and musical instruments. To date, we have seen delayed-type hypersensitivity reactions to musical instruments<sup>2</sup> such as the flute,<sup>3</sup> trumpet,<sup>4</sup> cello,<sup>4</sup> and guitar.<sup>5</sup> Here, we report a case in a pediatric trombonist.

Commonly recognized sources of exposure to nickel include costume jewelry, eyeglass frames, belt buckles, jean snaps, school chairs, and cell phones. We believe that antiquated musical instruments provided by schools and passed down from one class to the next, year after year, are another significant source of nickel exposure. Recently, we examined a 15-year-old boy with vesicular hand dermatitis that developed 2 months after he started playing a school-issued trombone (Fig 1). Patch testing yielded a ++ reaction to nickel, a + reaction to palladium, and negative reactions to chromium, cobalt, vanadium, and titanium (Fig 2).

Dimethylglyoxime-ammonia (DMG-A) testing demonstrated intense nickel release where there was worn plating on the instrument (Fig 3). Given that DMG-A testing can detect nickel concentrations greater than 1:10,000 and that only 0.44  $\mu\text{g}/\text{cm}^2$  of nickel is required to elicit a reaction in



Figure 1. A school-issued trombone in hand.

the most nickel-sensitive patients, it is probable that frequent exposure to nickel-containing musical instruments can cause cutaneous reactions in sensitized pediatric individuals. DMG-A testing should be carried out on instrument bodies, keys, and mouthpieces, and on tuners, carrying cases, and strings for musical instruments (eg, guitar and cello strings).

We advised our patient's parents to exchange the instrument or to cover with duct tape the portions where the protective plating had worn off. The family was not permitted to cover the instrument because doing so was deemed a defacement of school property.



Figure 2. Instrument-associated allergic contact dermatitis (inset lower right) and a positive patch-test reaction.

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Reprints not available.

DOI 10.2310/6620.2011.10079

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**Figure 3.** Dimethylglyoxime-ammonia testing (+) at points of plating wear on the instrument.

Since 1992, Denmark has had the lowest rate of nickel sensitivity (8.1%) in Europe owing to regulations on nickel

concentrations in consumer goods. Younger people (aged 0–20 yr) have been the most affected.<sup>6</sup>

### Pearl

We call attention to musical instruments as a source of nickel exposure in an effort to reduce early exposure and to urge that measures be taken to provide our children and schools with safe equipment. Such measures could prevent cutaneous sensitization to an allergen that is otherwise difficult to avoid.

### References

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