

Dermatitis In Stringed Instrumentalists: A Focus on Violin and Viola

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Introduction and Methods

Dermatitis is the general term for skin irritation or inflammation. 1.5 million workers in the US suffer from occupational dermatitis annually, with up to a billion dollars in economic burdens.¹ Some studies suggest that up to half of musicians suffer from dermatologic conditions.² Stringed instrumentalists are at the highest risk for occupational dermatitis with up to 26% of musicians overall being affected enough to impact their music making.³ Understanding the unique circumstances and skin diseases related to stringed instrumentalists offers clinicians a chance to alleviate suffering, cosmetic concerns, and economic burdens of this unique patient population.

A literature review was conducted using PubMed for articles relevant to skin diseases in musicians. Two investigators independently reviewed and narrowed the search to 32 articles including case studies and literature reviews based on the inclusion criteria of stringed instruments. Data was then abstracted with a focus on violin, viola, cello, bass, guitar, and harp.

Case Report and Survey Results

Case	Age	Gender	Professional status	Etiology	Treatment that resolved symptoms
Moreno Case 2	16	Female	No	Nickel Sulfate	Handkerchief to avoid contact
Jue Case 1	21	Female	No	Nickel Sulfate	Improved posture and application of retinoid
Stern Case 1	46	Male	Professional	Mechanical	Improved posture
Stern Case 2	52	Male	Professional	Mechanical	Improved posture
Hausen Case 1	40	Female	No	Rosewood	Cloth to avoid contact, eventually quit violin
Lieberman Case 1	69	Male	No	Colophony, Abietic acid, Propolis	Avoidance, oral Cetirizine, mid-potency corticosteroid
Bork Case 1	35	Female	Professional	Ebony wood, Paraphenylenediamine, para-toluylenediamine sulfate	Box-tree wood chinrest
Alves Case 1	19	Female	Professional	Nickel and Colophonium	Avoidance of nickel by replacing metal bracket with plastic, Avoidance of colophonium by using artificial rosin
Myint Case 1	Late teen	Female	Professional	Supraclavicular and Submandibular	N/A
Myint Case 2	Early 20's	Female	No	Supraclavicular and Submandibular	N/A
Myint Case 3	Early 20's	Female	Professional	Supraclavicular and Submandibular	N/A

Researchers	N value	Complaints of Fiddler's Neck
Onder et al	N=55	9
Gambichler	N=89	17

Fiddler's Neck

Fiddler's Neck is one of the most common skin conditions found in violinists and violists. It presents as an area under the angle of the left mandible where the violin rests as well as a well-defined area of varying lichenification, hyperpigmentation, and erythema. Histological specimens may show hyperkeratosis, acanthosis, histiocytic cell infiltrate with foreign body granulomas and follicular cysts.⁴ Etiology ranges from mechanical abrasions to contact dermatitis. The submandibular variety is classically precipitated by repeated mechanical pressure on the area causing shear stresses on the skin, leading to Acne Mechanica.⁵ The supraclavicular variety is most often caused by irritant and allergic contact dermatitis, presenting similar to contact eczema.^{5,7} Other contributing factors include poor posture, excessive perspiration, and lack of proper hygiene.⁸⁻⁹

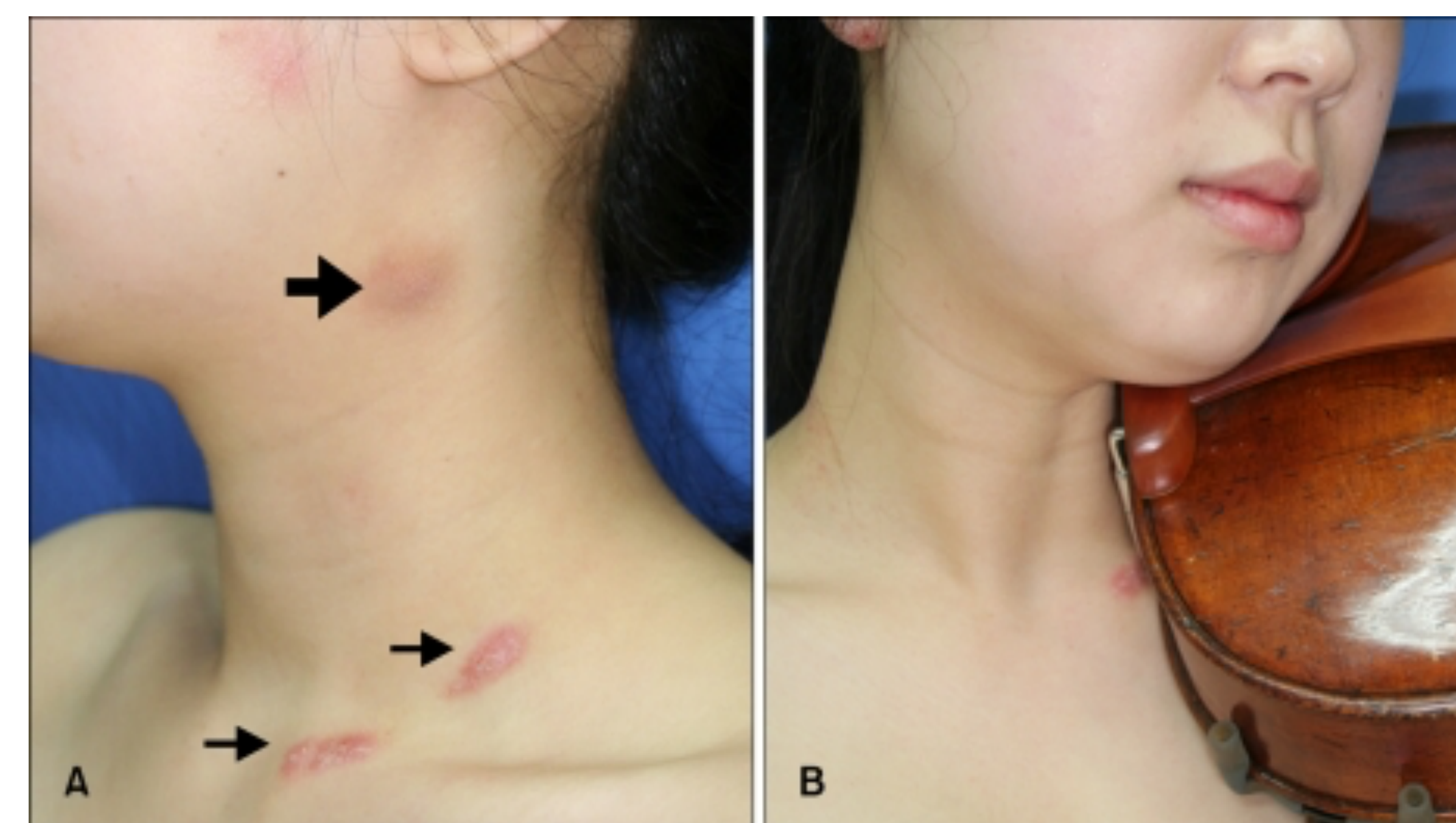


Fig. 1 (A) A hyperpigmented lichenified plaque on the neck just below the angle of the patient's left mandible (thick arrow) and erythematous scaly plaques on the left lower neck (thin arrow). (B) Performance position of the viola player.⁹

Components of a violin or viola are commonly made of skin irritating substances. Two of the most commonly encountered irritants are nickel and colophonium. Nickel is found in the bracket that secures the chinrest and is a component of the strings. An experimental study by Rezić et. all suggest that nickel concentrations greater than 0.05% within the strings can cause contact dermatitis, with the viola C string consisting of the highest concentration at 37.67%.¹¹ Dermatitis refractory to corticosteroid may be an indication for allergy patch test work-up for nickel sensitivity.¹² While it is the most common contact dermatitis in violinists, it is not clear whether the prevalence of nickel sensitization is due to the overall prevalence of nickel sensitivity in the general population or due to occupational exposure.¹⁰ Cases described by Moreno and Alves show that avoidance or barriers between the skin and instrument prove to be effective treatments without necessitating medication.¹²⁻¹³

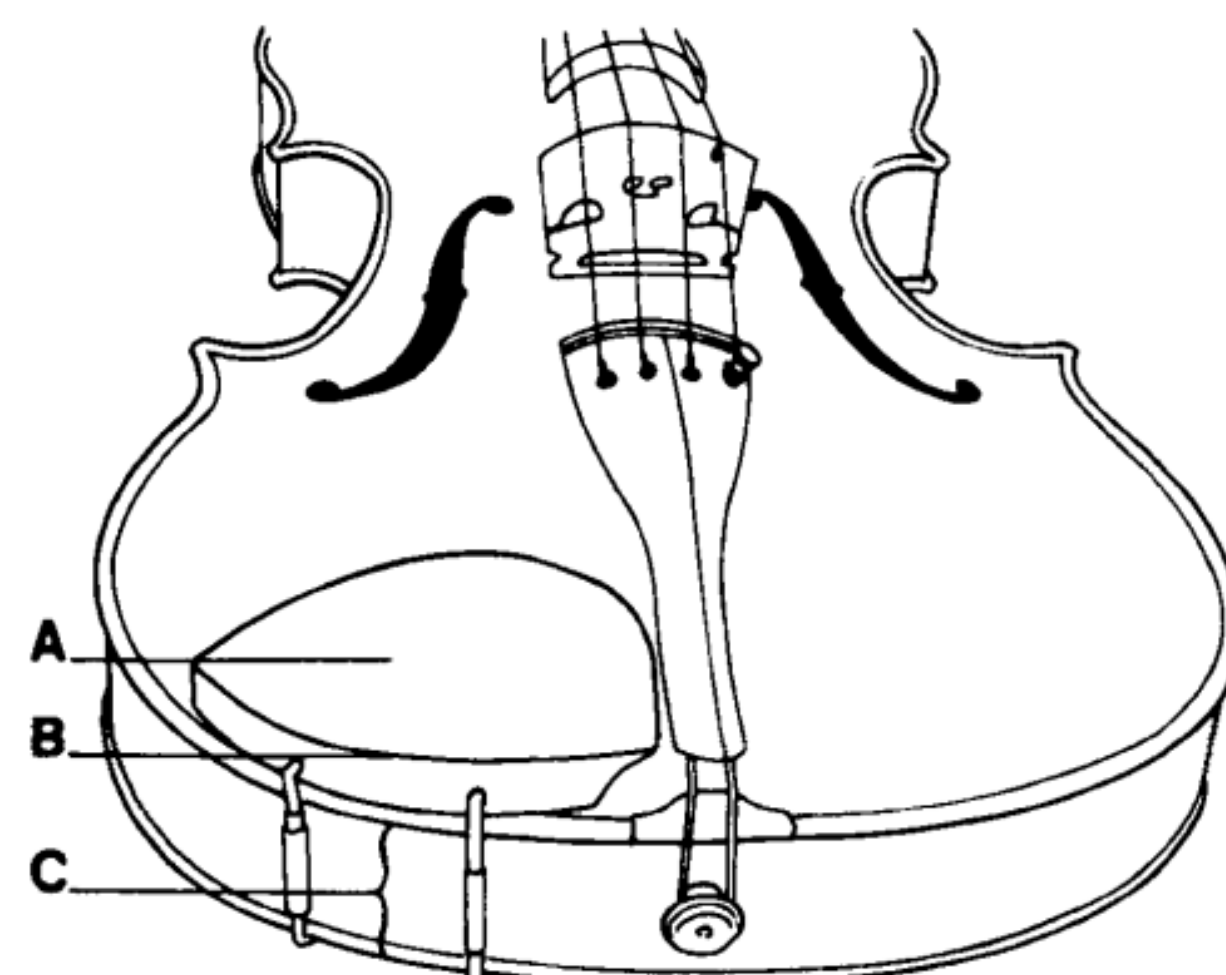


Fig. 2 Components of a violin. (A & B) illustrate the chinrest. (C) The bracket that secures the chinrest to the violin.¹⁸

Colophony is the rosin that is applied to the bow hairs of an instrument. Lieberman describes a case of a violin maker who was allergic to both colophony and propolis, which is found in the wood varnish. This was subsequently treated with avoidance, cetirizine, and mild corticosteroids.¹⁴ Propolis is a substance found in many natural cosmetics and is a popular material in instrument varnish thanks to claims that the famous violin maker Stradivarius used it in his own instruments.¹⁵⁻¹⁶

Rosewood and Ebony wood are both commonly used materials in violin chinrests.¹⁶ In addition to avoidance, the cases presented by Bork and Jue offer a solution by substituting the wooden violin chinrest by one made of plastic to reduce exposure to ebony wood and varnish containing para-phenylenediamine and para-toluylenediamine sulfate.^{9,17}

Role of Posture

Proper violin posture is a viable conservative treatment option for mechanically induced skin lesions. When fatigued, it is possible that the violinist allows for drooping of their playing position. The slanting position allows for the chinrest to “dig” into the neck, while proper horizontal positioning allows the flat base to sit on the neck (Figure 3).¹⁸ Two professional orchestral violinists and a long-time viola player were treated of their Fiddler's neck after addressing their playing position.^{9,18}

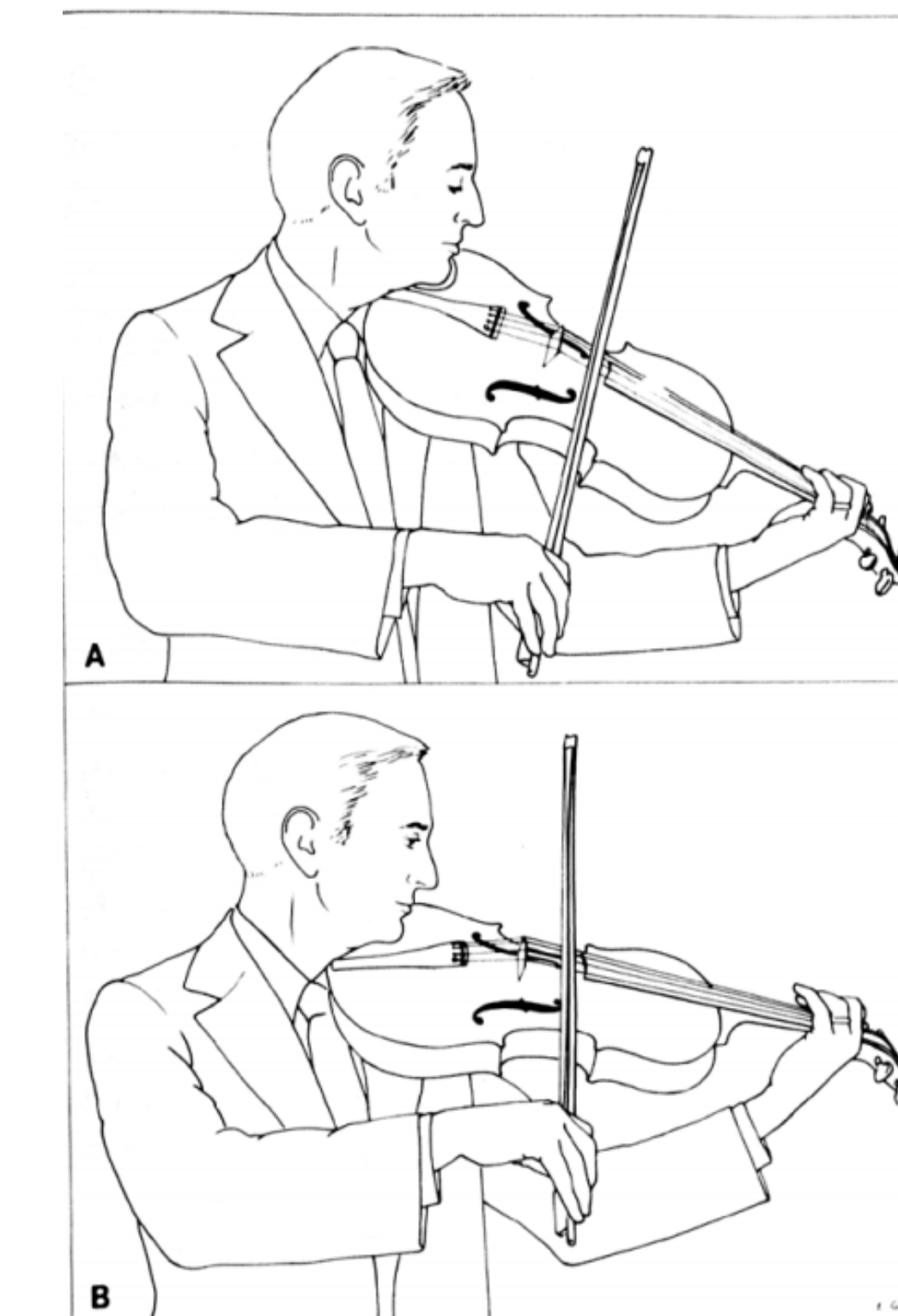


Fig. 3 (A) depicts improper playing position. (B) depicts proper playing position with base flat on the neck.¹⁸

Risk Factors

- Stringed instrumentalists are the most at-risk for instrument-related skin disorders.^{13,19-20}
- Stringed instrumentalists have the highest practice frequencies (p=0.031) and instrument related skin disorders are significantly associated with high weekly practice frequencies (p=0.022).¹⁹
- Women are more likely to report dermatitis, but male gender is more severely correlated with dermatologic problems.²¹⁻²²

Other Stringed Instruments

- Callosities are the most common skin-related disorder among stringed musicians and are associated with higher practice frequencies.¹⁹
- Harpists do not suffer from Fiddler's Neck but have much more severe pain and bleeding related finger and nail issues.²³
- Harpists rarely report with allergic contact dermatitis, but when it does occur, the most likely agent is potassium dichromate, a tanning agent for the strings.²³
- Bow related allergies also occur in cello and bass players due to para-phenylenediamine used to stain the bow.²³

Conclusion

Proper education on basic violin posture may prevent the need for pharmacologic therapy in Fiddler's Neck. Case reports suggest a predominance of Fiddler's Neck in women, but this may be biased due to the predominance of women being more likely to report dermatitis. There is inconsistency within the literature on the most common etiology of Fiddler's neck. Some sources list irritant contact dermatitis as the most common cause while others list allergic contact dermatitis. Being familiar with common materials used in the manufacture of instruments is useful when narrowing down the etiology of Fiddler's Neck. There is a disproportionately large amount of literature regarding Fiddler's Neck compared to other dermatologic conditions related to stringed instrumentalists. Other than brief mention of a “cellist's chest” and “cellist's knee,” data on dermatologic diseases in cello and bass players is lacking. The largest survey populations were professionals and university students in Germany and France. Conducting research on the local professional musician population may reveal a different pattern and be more specific for the population in the United States.

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