

**To the Editor:**

The recent article by Sonntag and Peters (1) on the effect of prion decontamination protocols on nickel-titanium (NiTi) rotary surfaces concludes by making a clinical recommendation that seems to be based on a flawed argument. The authors concluded that the single use of rotary NiTi instruments was recommended to avoid transmission of infectious diseases. They did not qualify this statement to indicate that it specifically referred to prion disease as indicated in their aim. Because of the potential long-term implications to endodontic treatment in the community, particularly at a public health level, we wish to address a number of the issues raised in the article.

Although the authors have correctly acknowledged the animal studies showing prion immunoreactivity, they have not cited the original research reports; rather they have accepted the interpretation of other authors (2, 3). If they had cited the original research the authors would also have noted the important finding that the periodontal tissues actually had a higher level of infectivity than the pulp (4). The importance and relevance of the periodontal tissues was acknowledged (5) in a review that also confirmed that the disposal of endodontic instruments is only indicated in patients with known Creutzfeldt-Jakob disease (CJD) or variant CJD. There is no literature available to show that periodontal probes with fine gradations are effectively cleaned by routine dental instrument cleaning protocols, so perhaps single-use periodontal probes are indicated? A similar argument can be applied to extraction forceps.

The authors cite the opinion of Smith et al. (6) that endodontic instruments come into intimate contact with peripheral branches of the trigeminal nerve. In fact, the pulp is an innervated connective tissue (7), as is the periodontium. Again, what would the recommendation be concerning periodontal probes, scalers, periodontal curettes, and extraction forceps? The authors state "...current methods for decontaminating endodontic instruments seem unable to completely remove all biologic material." This is not true. Although the authors later cite Parashos et al. (8), they seem to have missed the point that we were able to obtain 100% removal of biologic debris as measured at a microscopic level. In support of their statement, they cite Smith et al. (6), which merely confirmed that, at that time, there was no known effective cleaning protocol available. They also cited Linsuwanont et al. (9), which represented the early work from our laboratory

in the development of our eventual protocol. The cleaning protocols used by the authors assessed "currently recommended prion decontamination protocols." We can see no point in doing this when it is accepted that in cases of known CJD disease, instruments should essentially all be disposed of or go through extreme sterilization processes. Conversely, if patients are not in an identified risk group, this level of precaution is unnecessary.

Therefore, for the authors to extrapolate their findings and recommend single use of rotary NiTi instruments ignores the current recommendations by health authorities concerning the categories of risk (5). It appears that the authors have confused specific prion decontamination protocols with general routine cleaning and infection control regimens as part of universal precautions.

Consequently, it is our assessment that the recommendations in the paper by Sonntag and Peters (1) are based on flawed interpretations of the literature and confusion concerning at-risk and general patient care and ignore the biological implications of the pulp in relation to the patient's overall health.

**Peter Parashos  
Harold Messer**

Melbourne, Victoria, Australia

**References**

1. Sonntag D, Peters OA. Effect of prion decontamination protocols on nickel-titanium rotary surfaces. *J Endod* 2007;33:442-6.
2. Smith AJ, Bagg J, Ironside JW, Will RG, Scully C. Prions and the oral cavity. *J Dent Res* 2003;82:769-75.
3. Aasim SA, Mellor AC, Qualtrough AJ. The effect of pre-soaking and time in the ultrasonic cleaner on the cleanliness of sterilized endodontic files. *Int Endod J* 2006;39:143-9.
4. Ingrosso L, Pisani F, Pocchiarri M. Transmission of the 263K scrapie strain by the dental route. *J Gen Virol* 1999;80:3043-7.
5. Azarpazhooh A, Leake JL. Prions in dentistry—what are they, should we be concerned, and what can we do? *J Can Dent Assoc* 2006;72:53-60.
6. Smith A, Dickson M, Aitken J, Bagg J. Contaminated dental instruments. *J Hosp Infect* 2002;51:233-5.
7. Okiji T. Pulp as a connective tissue. In Hargreaves KM, Goodis HE, eds. *Seltzer and Bender's Dental Pulp*. Carol Stream, IL, Quintessence Publishing Co Inc, 2002.
8. Parashos P, Linsuwanont P, Messer HH. A cleaning protocol for rotary nickel-titanium endodontic instruments. *Aust Dent J* 2004;49:20-7.
9. Linsuwanont P, Parashos P, Messer HH. Cleaning of rotary nickel-titanium endodontic instruments. *Int Endod J* 2004;37:19-28.

**Reply**

We are most thankful for the opportunity to comment on the questions raised by Dr Parashos and colleagues concerning our article published recently in the *Journal of Endodontics* (1). Please allow us also to take

time to acknowledge the merits of Drs Parashos and Messer in the field of nickel-titanium rotary instrument performance and in particular their disinfection protocols.

Obviously, concerns over the dissemination of transmissible spongiform encephalopathies may differ between countries and continents as stated by the World Health Organization (2). In particular, European health authorities are highly concerned. The British Department of Health stated that "almost everyone is at some risk of being infected with variant Creutzfeldt-Jacob disease due to dietary exposure to BSE [bovine spongiform encephalopathy]. Any additional risk from a root canal treatment could only arise if the instruments had been previously used on an infective patient. Nevertheless, a precautionary approach is justified in view of the large number of procedures carried out" (3). As mentioned in our article, German health authorities categorized endodontic instruments within the class of highest concern (4). For these reasons, the current recommendation of the British Department of Health is to use single-use endodontic files and reamers on a precautionary basis in order to reduce any risk of vCJD transmission (3).

We totally agree with your concern about periodontal tissue and note that prion proteins have been identified even in blood and saliva (5), but periodontal or surgery instruments were neither used in our study nor discussed in our article. Moreover, most previous studies (and accepted standards) are based on data pertaining to hamster prion protein. As we know today, human prions are 100,000 times more difficult to inactivate than hamster prions (6), and furthermore prion diseases have extremely long incubation periods, often many decades (7).

The idea that there is a defined at-risk patient population singled out from patients in general is in our opinion not practical. A mathematical analysis predicted that as many as 5,000 individuals in the UK population might be infected. The possible prevalence of asymptomatic vCJD infections in other countries is not known (2). Universal precautions are needed in a situation in which the spread of disease can occur from unsuspected sources.

In conclusion, we believe that we have reported in an unbiased fashion on the cleaning of any nickel-titanium instrument used in contact with patients, leading to recommendations that benefit the practitioner to an improved patient care.

**David Sonntag**  
Marburg, Germany

**Ove A. Peters**  
San Francisco, CA

### References

1. Sonntag D, Peters OA. Effect of prion decontamination protocols on Nickel-Titanium rotary surfaces. *J Endod* 2007;33:442–6.
2. WHO: WHO Guidelines on Tissue Infectivity Distribution in Transmissible Spongiform Encephalopathies. Geneva, Switzerland: WHO; 2006:42–6
3. Department of Health (UK): Advice for dentists on re-use of endodontic instruments and variant Creutzfeldt Jacob disease. Gateway Approval Reference No: 8100. (April 2007).
4. Robert Koch Institute: Informationen zu CJK/vCJK. Available at: [www.rki.de/cdn\\_049/nn\\_196658/DE/Content/Infekt/Krankenhaushygiene/Erreger\\_ausgewaehlt/CJK/uebersicht.html](http://www.rki.de/cdn_049/nn_196658/DE/Content/Infekt/Krankenhaushygiene/Erreger_ausgewaehlt/CJK/uebersicht.html). Accessed May 1, 2007.
5. Mathiason CK, Powers JG, Dahmes SJ, et al. Infectious prions in the saliva and blood of deer with chronic wasting disease. *Science* 2006;314:133–5.
6. Peretz D, Supattapone S, Giles K, et al. Inactivation of prions by acidic sodium dodecyl sulfate. *J Virol* 2006;80:322–31.
7. Collinge J, Whitfield J, Mckintosh E, et al. Kuru in the 21st century—an acquired human prion disease with very long incubation periods. *Lancet* 2006;367:2068–74.