beef-derived heparin should be re-evaluated for medical use and dialysis patients suffering from encephalopathies should be screened for vCJD. Apart from the more specific mode of action [6], recombinant hirudin should be considered if the safe origin of heparin cannot be certified.

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**Heparin and dialysis: reasons to make a change?**

Sir,

The availability of heparin was undoubtedly one of the main factors contributing to the widespread use of clinical dialysis: although lipolytic activity, osteoporosis and thrombocytopenia were described, clinical advantages remained unrivalled until today. Nevertheless, several effects attributable to heparin are less widely recognized, though theoretically noteworthy.

Heparin has immunosuppressive properties, interfering with both humoral and cell-mediated immunity [1–2]: these actions should be probably taken in to account since dialysis patients are prone to infections and receive an average of 500 000–1 million units/year of heparin.

Heparin is able to split the activin–follistatin complex, allowing activin to stimulate smooth muscle cells of vessel wall to proliferate [3]: the risk of systemic atherosclerosis could therefore be increased [4]. In addition, by the same mechanism heparin could favour the process of intimal hyperplasia leading to stenosis, usually observed just at the venous end of vascular access, the site where dialysis-administered heparin concentration is higher than in any other site of the vessel system.

Finally, the source of heparin could be of some concern after description of the variant of Creutzfeld-Jacob encephalopathy (vCJD) as a prion disease transmitted by cows suffering from BSE. Of interest, it was reported that there was an increased risk of sporadic CJD for patients undergoing surgery, unfortunately without explanation of the mechanism(s) involved [5]. Intra-operative or prophylactic post-operative heparin administration could not be ruled out. Since heparin can be extracted from beef or pork offal,