

## Effects

Magnesium can block synaptic transmission of nerve impulses causing loss of deep tendon reflexes. More severe toxicity can cause flaccid paralysis and apnoea. The effect on smooth muscle results in ileus and urinary retention. Through its effect on calcium and potassium channels, hypermagnesaemia can cause bradycardia and hypotension (Table 2). Hypermagnesaemia can also cause hypocalcaemia, possibly by inhibiting the release of parathyroid hormone. Hyperkalaemia has also been associated with hypermagnesaemia.<sup>1</sup>

## Treatment

Hypermagnesaemia can be prevented by not using magnesium containing antacids or cathartics in patients with renal insufficiency. Patients with normal renal function will usually recover after the infusion or oral intake of magnesium-containing compounds stops. Intravenous calcium can be used as an antidote for hypotension and respiratory depression. In patients with severe renal dysfunction, dialysis may be required.<sup>1</sup>

## Conclusion

Disturbances in magnesium homeostasis can lead to serious conditions some of which are only amenable to treatment with magnesium. Doctors must remember to measure magnesium especially in patients who are at risk. Patients with hypocalcaemia and hypokalaemia who are magnesium deficient should be treated with magnesium. Hypermagnesaemia can be prevented by not using magnesium-containing compounds in patients with renal insufficiency.

## References

1. Topf JM, Murray PT. Hypomagnesemia and hypermagnesemia. *Rev Endoc Metab Disord* 2003;4:195-206.
2. Gums JG. Magnesium in cardiovascular and other disorders. *Am J Health-Syst Pharm* 2004;61:1569-76.
3. Fox C, Ramsomair D, Carter C. Magnesium: its proven and potential clinical significance. *South Med J* 2001;94:1195-201.
4. Schlingmann KP, Konrad M, Seyberth HW. Genetics of hereditary disorders of magnesium homeostasis. *Pediatr Nephrol* 2004;19:13-25.
5. Moe SM. Disorders of calcium, phosphorus, and magnesium. *Am J Kidney Dis* 2005;45:213-18.
6. Whang R, Hampton EM, Whang DD. Magnesium homeostasis and clinical disorders of magnesium deficiency. *Ann Pharmacother* 1994;28:220-6.
7. Tso EL, Barish RA. Magnesium: clinical considerations. *J Emerg Med* 1992;10:735-45.
8. Tietz NW, Burtis CA, Ashwood ER, Bruns DE, editors. *Tietz textbook of clinical chemistry and molecular diagnostics*. St Louis, MO: Elsevier Saunders; 2006.
9. *Prescribing intravenous fluids and electrolytes. Version 2. Fluid and electrolyte safety team, Safe medication practice unit. Queensland Health; 2005. [Available on request from RBWH-SMPU@health.qld.gov.au]*
10. Bringhurst FR, Demay MB, Krane SM, Kronenberg HM. Bone and mineral metabolism in health and disease. In: Kasper DL, Braunwald E, Fauci AS, Hauser SL, Longo DL, Jameson JL, editors. *Harrison's principles of internal medicine*. 16th ed. New York: McGraw-Hill; 2005. Chapter 331.

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## Self-test questions

*The following statements are either true or false (answers on page 111)*

7. Hypermagnesaemia results in increased deep tendon reflexes.
8. Patients with hypomagnesaemia and a low albumin may have normal concentrations of ionised magnesium.

## Book review

**Disputes and Dilemmas in Health Law.**  
**Freckleton I, Petersen K, editors.**

**Sydney: The Federation Press; 2006.**  
**698 pages. Price \$125**

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*Disputes and Dilemmas in Health Law* is an Australian book which explains that health law is significant because it reflects on fundamental issues that impact on the beginning, end and quality of life. The book is divided into sections on health law and ethical dilemmas, human rights, public health, reproductive technologies, the end of life, litigation and liabilities, and privacy and confidentiality. The contributors include many eminent Australian legal and medical experts.

There is discussion about the 'ethics of care', and the relationship between ethics and law is explored. Law deals with practical issues, such as resolving disputes, and focuses on facts, but has limitations in dealing with moral issues.

The ethical and legal issues related to advance directives, and competency to consent are explained, and information is provided about legislation in different Australian states.

Public health law covers environmental health issues and the control of disease and drugs. It is a critical area for prevention of many illnesses and dealing with epidemics. International issues such as the impact of trade agreements on health and practice are explored.

Issues related to the end of life are covered, including legislation in relation to the coroner, organ donation and end-of-life decisions. Legal cases concerning the insistence of families that life-sustaining treatment be continued in situations of overwhelming illness are discussed.

The section on litigation and liability covers medical negligence law. The question of whether a doctor has breached duty of care is discussed and the Bolam principle described.

This principle was rejected in an Australian case, however, a

modified form has been introduced as part of a review of tort reforms in Australia. 'A professional does not incur a liability in negligence... if it is established that [they] acted in a manner that... was widely accepted by peer professional opinion as competent professional practice'.

The final section looks at privacy and confidentiality. Disputes about confidentiality are only a recent phenomenon. Much discussion relates to HIV infection, in which a balance is sought between protecting the individual from discrimination and ensuring public safety. The obligations relating to privacy of information and allowing access to records are reviewed. The impact of legislative changes on records is discussed as well as issues relating to the electronic transfer of information.

Disputes and Dilemmas in Health Law is presented in a clear and readable manner. One can focus on topics of particular relevance, but it is likely that the reader will find the text engaging enough to read much more broadly. It contains important information for all practitioners, and there are many topics directly relevant to general practitioners. The book achieves its aims by providing clear and comprehensive information, and by provoking thought about ethical and legal aspects of health care.

## Book review

### **Therapeutic Guidelines: Oral and Dental. Version 1.**

**Melbourne: Therapeutic Guidelines Limited; 2007. 235 pages. Price \$39, students \$30, plus postage**

*Camile S Farah, Consultant Oral Pathologist and Senior Lecturer in Oral Medicine and Pathology, School of Dentistry, University of Queensland, Brisbane*

The new Therapeutic Guidelines: Oral and Dental is a long overdue but very welcome addition to the family of pocket-sized user-friendly reference guides to therapeutics. This first edition is a collaborative effort between the Therapeutic Guidelines Limited and the Australian Dental Association.

'Oral and Dental' aims to assist the general dental practitioner in their day-to-day practice and provides sound advice in situations where a prescription may be required. In an age of polypharmacy, the dentist is continuously challenged with patients taking multiple therapeutic preparations. The chapters on 'Dental management of patients taking medications' and

'Medical emergencies' are succinct and will prove very useful in daily dental practice.

This book is well laid out, although it would perhaps have been better to move chapters on 'Antibiotic prophylaxis' and 'Acute odontogenic infections' further up the contents table, and move chapters on 'Halitosis' and 'Oral mucosal disease' further down. In addition, the chapters on 'Getting to know your drugs' and 'Dental management of patients taking medications' could have been further subdivided in the table of contents for ease of reference, due to their length. Nonetheless, the extensive use of tables throughout the book compensates for this.

Therapeutic Guidelines: Oral and Dental is a single reference that brings together information usually obtained from multiple sources, and is packed with useful data based on clinical evidence, which will see it become an integral part of the armamentarium of every practising dentist. It is also a very valuable learning guide for both undergraduate and postgraduate dental students, and other practitioners who deal with oral disease. This guide comes with my strongest recommendation as a useful resource for all practitioners involved in the assessment and management of dental and oral disease.