

## **Guideline for the Management of Hypomagnesaemia in Adults**

**This guideline is only for use in hypomagnesaemia, not for other therapeutic indications.**

### **Overview** <sup>(1)</sup>

Magnesium is an essential constituent of many enzyme systems, particularly those involved in energy generation; the largest stores are in the skeleton.

Hypomagnesaemia may cause secondary hypocalcaemia and hypokalaemia.

### **Signs and symptoms of hypomagnesaemia** <sup>(2-4)</sup> (More likely if levels <0.5mmol/L)

Anorexia, nausea, confusion, weakness, ataxia, paraesthesia, tetany, tremor, muscle fasciculations.

Cardiac arrhythmias may occur. Digitalis toxicity may be exacerbated.

With very low levels seizures, drowsiness and coma.

### **Causes of hypomagnesaemia** <sup>(1-4,9)</sup>

Reduced intake, anorexia, malabsorption due to short bowel, coeliac disease, Crohn's disease.

Excessive losses e.g. in diarrhoea, stoma or fistula output, NG losses, renal losses.

Chronic alcoholism, uncontrolled diabetes, ketoacidosis, disorders of the parathyroid gland, low vitamin D levels, acute pancreatitis, re-feeding syndrome, severe burns, genetic causes.

Drugs e.g. aminoglycosides, amphotericin B, ciclosporin, cisplatin, theophylline, proton pump inhibitors, digoxin and diuretics.

### **Precautions to treatment** <sup>(2,5)</sup>

Parenteral magnesium should be avoided in patients with heart block or myocardial damage.

Renal impairment increases the risk of hypermagnesaemia developing, consider dose reduction.

Myasthenia gravis (may worsen symptoms), hepatic failure.

Laxative effect of oral salts – caution if pre-existing diarrhoea or high output stoma or fistula.

### **Side effects of treatment** <sup>(2,6)</sup>

Oral magnesium salts cause diarrhoea (or increased output in patients with stomas) so give with food if possible to reduce this.

Hypermagnesaemia – more common with IV treatment or in renal impairment – see symptoms below.

Hypocalcaemia, phlebitis. Rapid IV administration may cause hypotension and flushing.

### **Interactions** <sup>(1)</sup>

Oral magnesium salts reduce absorption of oral bisphosphonates – see BNF individual entries.

### **Monitoring** <sup>(2,6,8)</sup>

With IV administration monitor blood pressure, heart rate, respiratory rate. Consider ECG monitoring with administration rates >8mmol/hr. Urine output (if low then magnesium may accumulate).

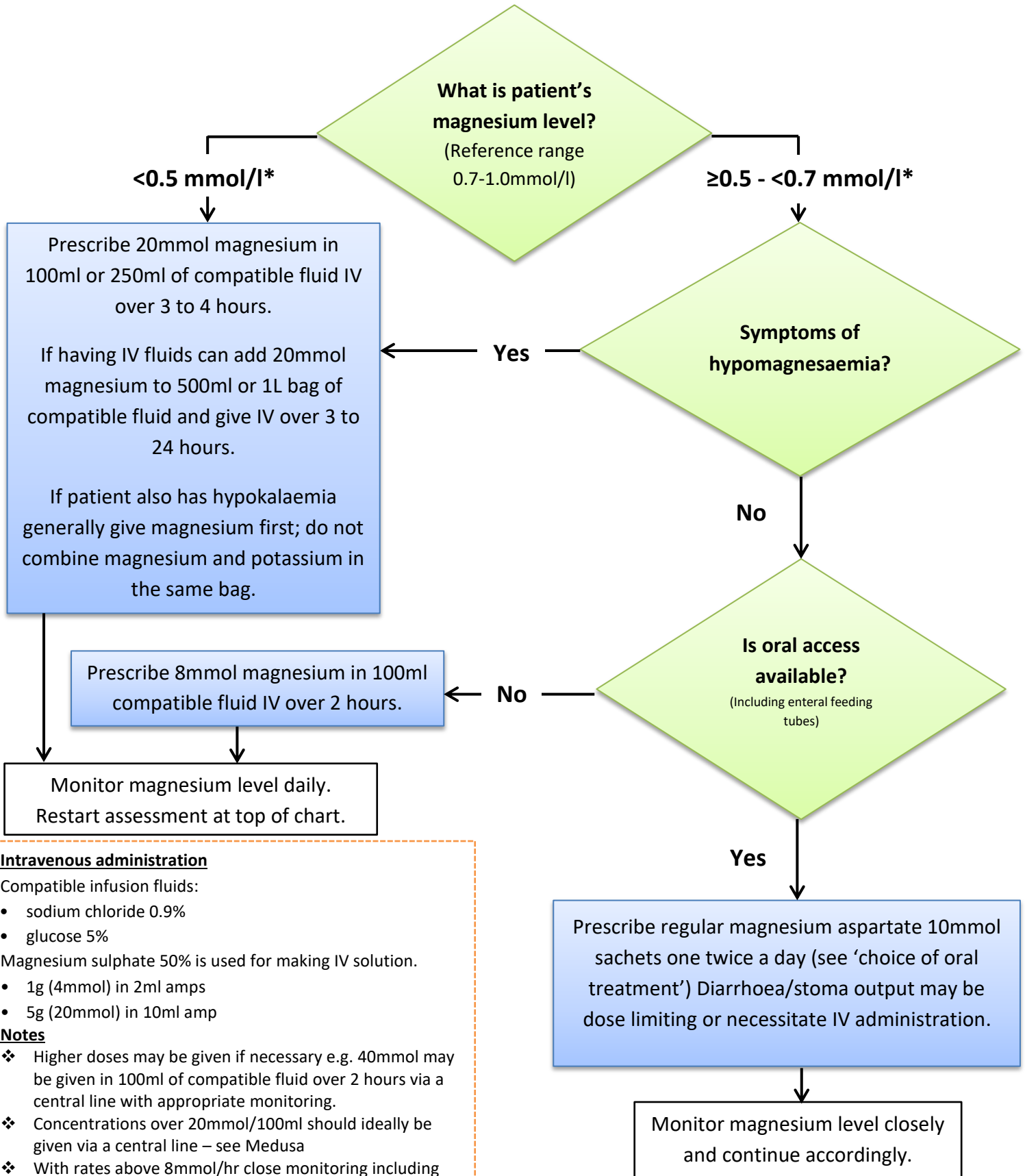
Signs of hypermagnesaemia (may begin at levels >2mmol/L) - important symptoms are respiratory depression and loss of tendon reflexes due to neuromuscular blockade. Other symptoms of hypermagnesaemia include flushing, thirst, nausea and vomiting, drowsiness, confusion, weakness, double vision, slurred speech, hypotension, bradycardia and coma. Complete heart block or cardiac arrest at levels >6.0-7.5 mmol/L.

### **Choice of oral/enteral treatment** (see BNF for details)

Magnesium aspartate sachets are not licensed with GFR <30ml/min but may be used with caution.

Magnesium aspartate sachets may be used via jejunal feeding tubes (unlicensed)

Magnesium oxide capsules and magnesium glycerophosphate tablets reserved for specialist use only.



**Intravenous administration**

Compatible infusion fluids:

- sodium chloride 0.9%
- glucose 5%

Magnesium sulphate 50% is used for making IV solution.

- 1g (4mmol) in 2ml amps
- 5g (20mmol) in 10ml amp

**Notes**

- ❖ Higher doses may be given if necessary e.g. 40mmol may be given in 100ml of compatible fluid over 2 hours via a central line with appropriate monitoring.
- ❖ Concentrations over 20mmol/100ml should ideally be given via a central line – see Medusa
- ❖ With rates above 8mmol/hr close monitoring including ECG is recommended. Maximum rate 36mmol/hr
- ❖ See Medusa for further details.
- ❖ For TPN patients: please liaise with pharmacy manufacturing or dietetics.

For further advice please contact Medicines Information.  
☎ GRH: 6108 ☎ CGH: 3030

## References

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