

GUIDELINES FOR THE ACUTE TREATMENT OF HYPOMAGNESAEMIA IN ADULTS

This guidance does not override the individual responsibility of health professionals to make appropriate decision according to the circumstances of the individual patient in consultation with the patient and / or carer. Health care professionals must be prepared to justify any deviation from this guidance.

INTRODUCTION

This guideline covers the treatment of hypomagnesaemia for adult inpatients.

THIS GUIDELINE IS FOR USE BY THE FOLLOWING STAFF GROUPS:

All qualified healthcare professionals involved in prescribing or administering magnesium supplements for adult patients.

Lead Clinician(s)

Keith Hinton Clinical Team Lead Pharmacist Critical

Care and Surgery WAHT

Approved at Pharmacy Governance

Committee

19th September 2025

Approved by Medicines Safety Committee on:

Where medicines are included in document

8th October 2025

Review Date:

This is the most current document and should

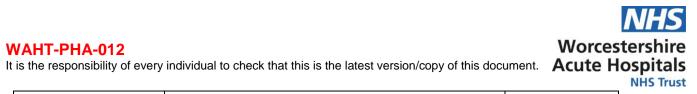
be used until a revised version is in place

8th October 2028

Key amendments to this Document:

Date	Amendment	By:
October 2010	Addition oral therapy guidance.	See list
	Replaces WAHT-CRI-012 as applies to all	
	patients not just ITU	
December 2012	No changes – Approved by Nick Hubbard	Keith Hinton
January 2014	Additional monitoring information	Keith Hinton
·	Updated serum range as per biochemistry	
December 2015	Addition of magnesium aspartate dehydrate	Natalie Messer
	(licensed oral preparation)	
December 2017	Sentence added in at the request of the Coroner	
March 2018	Document extended for 3 months as approved by	TLG
	TLG	
May 2018	Minor change in formatting to improve clarity of	Ruth Buczko
	magnesium sulfate dose.	
	No change to clinical content required based on	
	literature review	

Guideline for acute treatment of hypomagnesaemia			
WAHT-PHA-012	WAHT-PHA-012 Page 1 of 15		



June 2020	Document extended for 6 months during Covid-19 period	
February 2021	Document extended as per Trust agreement 11/02/2021	
June 2021	Additions made to drug causes Additional directions and contraindications for oral administration Risk of extravasation added for IV administration	Hassan Yasin
June 2022	Inclusion of additional licensed oral magnesium supplement	Keith Hinton
July 2025	Minor changes – reformatting and re-clarification	Bezalel Bovas
September 2025	Approved at Pharmacy Governance Committee	

Guideline for a	Guideline for acute treatment of hypomagnesaemia				
WAHT-PHA-012	Page 2 of 15	Version 7			



GUIDELINES FOR THE ACUTE TREATMENT OF HYPOMAGNESAEMIA IN ADULTS

INTRODUCTION

This guideline covers the treatment of hypomagnesaemia for adult inpatients.

DETAILS OF GUIDELINE

Classification	Magnesium serum range (mmol/l)		
Normal	0.7-1.1		
Mild hypomagnesaemia	0.50-0.69		
Moderate/severe hypomagnesaemia	< 0.5		

NB: Magnesium is mainly an intracellular ion and the serum level may be normal despite significant deficiency.

Signs and symptoms of hypomagnesaemia (Most commonly occur <0.5mmol/L)			
Musculoskeletal	Muscle twitching, tremor, tetany, cramps, seizures		
CNS	Apathy, depression, hallucinations, agitation, confusion		
Cardiovascular	Tachycardia, hypertension, arrhythmias, increased digoxin toxicity		
Biochemical*	Hypokalaemia, hypocalcaemia, hypophosphataemia, hyponatraemia		

^{*} All signs and symptoms are generally non specific and could be attributed to other electrolyte abnormalities. Hypomagnesaemia rarely occurs alone and other electrolyte levels must be checked. In any hypokalaemia not responding to supplementation a decreased magnesium level should be suspected.

Causes of hypomagnesaemia:

Common causes include:

- Vomiting and diarrhoea
- Small bowel resection
- Malabsorption states
- Alcoholism
- Chronic renal failure

- Drainage from fistula
- Refeeding syndrome
- Drugs (see below)

Guideline for acute treatment of hypomagnesaemia				
WAHT-PHA-012	Page 3 of 15	Version 7		



Drug induced hypomagnesaemia:

This is not an exhaustive list. Contact your ward pharmacist or Medicines Information (ext 45776) for more details.

- Aminoglycosides (e.g. gentamicin)
- Amphotericin
- Bisphosphonates (e.g. pamidronate)
- Carboplatin
- Ciclosporin
- Cisplatin

- Diuretics (Loop & Thiazides)
- Foscarnet
- Proton pump inhibitors (PPIs)
- Salbutamol
- Tacrolimus
- Theophylline

NB: Potassium sparing diuretics are considered to be magnesium sparing.

TREATMENT:

In acute, severe or symptomatic hypomagnesaemia, cardiac monitoring is advised and magnesium should be given parenterally. Oral magnesium supplementation should be reserved to prevent recurrence of the deficit or to treat non-symptomatic hypomagnesaemia. Oral magnesium supplements can cause diarrhoea and therefore parenteral therapy may be preferred in patients with poor gastrointestinal absorption of magnesium or who are unable to tolerate oral supplements.

For patients at risk of refeeding syndrome, please refer to Trust guideline WAHT-NUT-006. For patients receiving parenteral nutrition please liaise with pharmacy to review the magnesium supplementation within the feed regimen.

IV Administration

- Up to 160mmol magnesium over 5 days may be required to replace the deficit in acute or severe hypomagnesaemia
- Magnesium is given by IV infusion of magnesium sulfate.
- Patients should be treated according to symptoms and serum levels. A reduced dosage and additional monitoring should be considered in renal impairment.
- Infusion fluid: Sodium chloride 0.9% or glucose 5%.

Dosing is largely empirical and depends on severity.

Mild (plasma level 0.5 - 0.69mmol/L) or asymptomatic

1 sachet once daily or 1 sachet twice daily of magnesium L-Aspartate as Magnaspartate® sachets

Contraindicated in patient with eGFR <30ml/min but may be used with caution

NB: If asymptomatic, only need to start if there is a clinical concern

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

Give intravenous (IV) magnesium sulfate in a hospital if the enteral route is not appropriate.

Guideline for acute treatment of hypomagnesaemia				
WAHT-PHA-012	Page 4 of 15	Version 7		



Magnesium sulfate 5g (20mmol Magnesium) in 250ml infusion fluid usually over 4 hours intravenously (can be given over 2 to 6 hours and 100ml if patient fluid restricted)

Reduce the rate of infusion if patient becomes bradycardic.

Moderate/Severe hypomagnesaemia (plasma level <0.5mmol/L) or Symptomatic emergencies e.g. in critical care.

Magnesium sulfate 10g (40mmol Magnesium) in 250ml infusion fluid over 4 hours intravenously

For patients with renal impairment, consider reducing the dose to 20mmol and repeating as necessary depending on repeat plasma level and/or patient symptoms.

Dilution:

- Magnesium sulfate 50% must ALWAYS be diluted before use
- A maximum concentration of magnesium sulfate 5% (50mg/mL) is recommended for peripheral administration (20mmol in 100ml) and should ideally be given centrally due to high osmolarity and risk of phlebitis.
- Suggested practice is to dilute up to 5g magnesium sulfate (20mmol magnesium) in 250mL of diluent
- Maximum rate is 150mg/min (20mmol over 33mins)
- Magnesium sulphate has a high osmolarity and may cause tissue damage if it extravasates into the surrounding tissue

Oral Administration

- To prevent recurrence of the deficit or to treat non-symptomatic hypomagnesaemia, magnesium may be given orally as a dose of 10-20mmol magnesium daily (10mmol once daily or 10mmol twice daily).
- This can be given as 1 sachet once daily or 1 sachet twice daily of magnesium L-Aspartate as Magnaspartate® sachets depending on severity of deficiency.
- Magnaspartate® sachets contain 243mg (10mmol) of magnesium.
- The contents of the sachet should be reconstituted and given immediately. (It can be reconstituted in 50-200mls of water, orange juice or tea).
- Oral magnesium salts commonly cause diarrhoea which may be reduced by administration with or after food. Therefore, consider IV supplementation for patients with diarrhoea or high output stomas.
- Note that Magnaspartate® sachets are contraindicated in patients with severe renal impairment (i.e. GFR < 30 ml/min)
- If this is insufficient in maintaining serum magnesium level within normal range, or for
 patients who are intolerant to magnaspartate, switching to an alternative magnesium salt
 may be appropriate e.g. magnesium citrate chewable tablets 4mmol at a dose of 1 to 2
 tablets three times a day. Please contact your ward pharmacist or Pharmacy department
 for more information.
- In prolonged deficiency states e.g. short bowel syndrome, high ileostomy output please refer the patient to the dietitian for assessment and optimisation of dietary intake.
- Contact your ward pharmacist for more information on the use of Magnaspartate in pregnancy, breastfeeding and patients with feeding tubes.

Guideline for acute treatment of hypomagnesaemia				
WAHT-PHA-012	Page 5 of 15	Version 7		

It is the responsibility of every individual to check that this is the latest version/copy of this document.
Acute Hospitals



MONITORING:

Magnesium levels should be checked daily as plasma levels may be artificially high whilst magnesium equilibrates with the intracellular compartment. Monitor calcium and other electrolyte plasma levels in patients with hypomagnesaemia.

However if toxicity is suspected treatment should be discontinued. Patients at risk of hypermagnesaemia include the elderly and patients with renal insufficiency. Clinical signs include:

- Hypotension
- Bradycardia
- Respiratory depression
- Depressed mental state
- Nausea and vomiting
- ECG abnormalities

Guideline for acute treatment of hypomagnesaemia				
Odidefine for acute treatment of hypomagnesacima				
WAHT-PHA-012	Page 6 of 15	Version 7		



During intravenous magnesium supplementation, monitor blood pressure, respiratory rate, heart rate, signs of hypermagnesaemia.

Monitoring Tool

Page/ Section of Key Document	Key control:	Checks to be carried out to confirm compliance with the policy:	How often the check will be carried out:	Responsible for carrying out the check:	Results of check reported to: (Responsible for also ensuring actions are developed to address any areas of non-compliance)	Frequency of reporting:
Page 4	All patients identified as acute hypomagnesaemia will have their plasma levels monitored daily until plasma concentration is in range and stable	Audit	Every 12 months	Nutrition and hydration committee	To directorates as appropriate	Annually

Guideline for acute treatment of hypomagnesaemia			
WAHT-PHA-012	Page 7 of 15	Version 7	



REFERENCES

- The British Medical Association and The Royal Pharmaceutical Society of Great Britain. British National Formulary, No. 68: September 2014 - March 2015. The Bath Press, Bath
- Weisenger JR & Bellarin-Font E. Magnesium & Phosphorus. Lancet 1998:352;391-6
- Sweetman S, editor. Martindale: The Complete Drug Reference [Internet]. 36th edition. London: Pharmaceutical Press; 2009. [accessed 21.10.10] Available from: www.medicinescomplete.com
- DrugDex®System: Hutchison TA, Shahan DR and Anderson ML: Drugdex®System.
 Micromedex, Greenwood Village, Colorado USA [edition 03/2003]
- Committee on Safety of Medicines. Drug Analysis Prints [2002]
- Trissel LA, editor. Handbook on Injectable Drugs [Internet]. 15th edition. Bethesda, USA: AmericanSociety of Health-System Pharmacists Inc; 2009. [accessed 21.10.10] Available from: www.medicinescomplete.com
- UK Medicines Information. Medicines Q&A 111.1: What oral magnesium preparations are available in the UK and which preparation is preferred for the treatment and prevention of hypomagnesaemia? Date prepared: 3rd August 2010 (accessed 7.10.10) Available from: www.nelm.nhs.uk
- Medusa (2014) Injectable Drug Administration Guide. Available online.
 Worcestershire Trust Intranet. (Accessed 30/05/18).
- UK Medicines Information. Q&A 111.5 What oral magnesium preparations are available in the UK and which preparation is preferred for the treatment and prevention of hypomagnesaemia? Date Prepared: 8th April 2015 (accessed 11/11/15) Available from www.nelm.nhs.uk.
- Summary of Product characteristics for Magnaspartate 243mg sachets Available from http://www.medicines.org.uk/emc/medicine/30238 (accessed 11/11/15).
- Summary of Product characteristics for Magnesium Sulfate 50%w/v Solution for Injection https://www.medicines.org.uk/emc/product/3539/smpc (accessed 25/05/20)
- Gröber U. Magnesium and Drugs. Int J Mol Sci. 2019;20(9):2094. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6539869/ (accessed 25/05/20)
- Summary of Product characteristics for Magnesium 4mmol chewable tablets Available from http://www.medicines.org.uk/emc/product/11577 (accessed 23/06/22).
- Specialist Pharmacy Service. Treating acute hypomagnesaemia in adults. Available from: https://www.sps.nhs.uk/articles/treating-acute-hypomagnesaemia-in-adults/ (accessed 12/06/25)

Guideline for a	cute treatment of hypo	omagnesaemia
WAHT-PHA-012	Page 8 of 15	Version 7



CONTRIBUTION LIST

Key individuals involved in developing the document

Name	Designation
Keith Hinton	Lead Pharmacist, Critical Care, Surgery and
	Theatres

Circulated to the following individuals for comments

Name	Designation
Mr Pandey	Consultant Surgeon
Dr Haldane	Consultant Gastroenterologist
Mr Perry	Consultant Surgeon

Circulated to the following CD's / Heads of dept for comments from their directorates / departments

Name	Directorate / Department
Dr Edwin Mitchell	Clinical Director, ICCU WAHT

Circulated to the chair of the following committee's / groups for comments

Name	Committee / Group
Steve Graystone	Chair of the Medicines Optimisation Committee
Alison Smith	Principal Pharmacist Medical Safety

Guideline for acute treatment of hypomagnesaemia		
WAHT-PHA-012	Page 9 of 15	Version 7

It is the responsibility of every individual to check that this is the latest version/copy of this document. **Acute Hospitals**



Supporting Document 1 - Equality Impact Assessment Tool

To be completed by the key document author and included as an appendix to key document when submitted to the appropriate committee for consideration and approval.

Please complete assessment form on next page;

Guideline for acute treatment of hypomagnesaemia		
WAHT-PHA-012	Page 10 of 15	Version 7







Herefordshire & Worcestershire STP - Equality Impact Assessment (EIA) Form Please read EIA guidelines when completing this form

Section 1 - Name of Organisation (please tick)

Name of Lead for Activity

Herefordshire & Worcestershire STP		Herefordshire Council	Herefordshire CCG
Worcestershire Acute Hospitals NHS Trust	х	Worcestershire County Council	Worcestershire CCGs
Worcestershire Health and Care NHS Trust		Wye Valley NHS Trust	Other (please state)

Details of individuals completing this assessment	Name Keith Hinton	Job title Clinical team lead Pharmacist	e-mail contact keith.hinton1@nhs.net
Date assessment completed	23.06.2022		

Section 2

Activity being assessed (e.g. policy/procedure, document, service redesign, policy, strategy etc.)	Title: Guideline for the acute treatment of hypomagnesaemia			
What is the aim, purpose and/or intended outcomes of this Activity?	As p	oer title		
Who will be affected by the development & implementation	X	Service User Patient	X	Staff Communities
of this activity?		Carers	q	Other
or triis activity:	q q	Visitors	q q	Outer
	Ч	VISILOIS	Ч	
Is this:	X Review of an existing activity q New activity			

Guideline for acute treatment of hypomagnesaemia		
WAHT-PHA-012	Page 11 of 15	Version 7



It is the responsibility of every individual to check that this is the latest version/copy of this document.

	q Planning to withdraw or reduce a service, activity or presence?
What information and evidence have you reviewed to help inform this assessment? (Please name sources, eg demographic information for patients / services / staff groups affected, complaints etc.	See references
Summary of engagement or consultation undertaken (e.g. who and how have you engaged with, or why do you believe this is not required)	Via MSC
Summary of relevant findings	

<u>Section 3</u>
Please consider the potential impact of this activity (during development & implementation) on each of the equality groups outlined below. Please tick one or more impact box below for each Equality Group and explain your rationale. Please note it is possible for the potential impact to be both positive and negative within the same equality group and this should be recorded. Remember to consider the impact on e.g. staff, public, patients, carers etc. in these equality groups.

Equality Group	Potenti	Potenti	Potenti	Please explain your reasons for any
	al positive impact	al <u>neutral</u> impact	al <u>negativ</u> <u>e</u>	potential positive, neutral or negative impact identified
	•	•	impact	
Age		Х		
Disability		X		
Gender Reassignment		X		
Marriage & Civil Partnerships		X		
Pregnancy & Maternity		X		
Race including Traveling Communities		X		
Religion & Belief		X		
Sex		X		
Sexual Orientation		Х		

Guideline for acute treatment of hypomagnesaemia			
WAHT-PHA-012	Version 7		



Equality Group	Potenti al positive impact	Potenti al neutral impact	Potenti al negativ <u>e</u> impact	Please explain your reasons for any potential positive, neutral or negative impact identified
Other		Х		
Vulnerable and				
Disadvantaged				
Groups (e.g. carers; care leavers; homeless; Social/Economic deprivation, travelling communities etc.)				
Health		Х		
Inequalities (any preventable, unfair & unjust differences in health status between groups, populations or individuals that arise from the unequal distribution of social, environmental & economic conditions within societies)				

Section 4

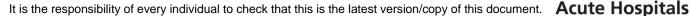
What actions will you take to mitigate any potential negative impacts?	Risk identified	Actions required to reduce / eliminate negative impact	Who will lead on the action?	Timeframe
How will you monitor these actions?		,	ı	'
When will you review this				
EIA? (e.g in a service redesign, this EIA should be revisited regularly throughout the design & implementation)				

Section 5 - Please read and agree to the following Equality Statement

1. Equality Statement

- 1.1. All public bodies have a statutory duty under the Equality Act 2010 to set out arrangements to assess and consult on how their policies and functions impact on the 9 protected characteristics: Age; Disability; Gender Reassignment; Marriage & Civil Partnership; Pregnancy & Maternity; Race; Religion & Belief; Sex; Sexual Orientation
- 1.2. Our Organisations will challenge discrimination, promote equality, respect human rights, and aims to design and implement services, policies and measures that meet the

Guideline for acute treatment of hypomagnesaemia			
WAHT-PHA-012	Version 7		





diverse needs of our service, and population, ensuring that none are placed at a disadvantage over others.

1.3. All staff are expected to deliver services and provide services and care in a manner which respects the individuality of service users, patients, carer's etc, and as such treat them and members of the workforce respectfully, paying due regard to the 9 protected characteristics.

Signature of person completing EIA	Keith Hinton
Date signed	23/06/2022
Comments:	
Signature of person the Leader	
Person for this activity	
Date signed	
Comments:	

















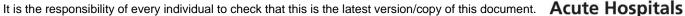








Guideline for a	Guideline for acute treatment of hypomagnesaemia			
WAHT-PHA-012 Page 14 of 15 Version 7				





Supporting Document 2 – Financial Impact Assessment

To be completed by the key document author and attached to key document when submitted to the appropriate committee for consideration and approval.

	Title of document:	Yes/No
1.	Does the implementation of this document require any additional Capital resources	No
2.	Does the implementation of this document require additional revenue	No
3.	Does the implementation of this document require additional manpower	No
4.	Does the implementation of this document release any manpower costs through a change in practice	No
5.	Are there additional staff training costs associated with implementing this document which cannot be delivered through current training programmes or allocated training times for staff	No
	Other comments:	

If the response to any of the above is yes, please complete a business case and which is signed by your Finance Manager and Directorate Manager for consideration by the Accountable Director before progressing to the relevant committee for approval

Guideline for acute treatment of hypomagnesaemia		
WAHT-PHA-012	Page 15 of 15	Version 7