

# LRI ED Magnesium Sulfate IV Prescribing Aid

## Scope

This document is intended as a prescribing aid for the common scenarios in which IV Magnesium Sulfate is used in the ED. These include:

- Acute asthma
- Eclampsia and pre-eclampsia
- Torsade des pointes – polymorphic VT
- Atrial fibrillation
- Hypokalaemia

Please see next pages for specific prescribing instructions.

## Background

Several UHL guidance documents providing information about the intravenous administration (IV) of Magnesium Sulfate in the context of hypomagnesaemia are currently available:

- Magnesium Sulfate: Procedure for the intravenous administration in adults (on [Medusa](#))
- [Hypomagnesaemia](#)
- [Guidelines for the management of severe pre-eclampsia and eclampsia](#)

This ED document provides practical information about the common scenarios in which IV Magnesium Sulfate is used in the Emergency Department (ED) in one place.

## General notes

- All patients requiring IV Magnesium Sulfate in the ED are by definition seriously unwell and require involvement of an ED middle grade or above
- Magnesium Sulfate IV infusions must always be delivered via an electronic infusion pump
- The ED stocks 10mL vials of Magnesium Sulfate as a 50% solution. Each vial therefore contains 5g or 20mmol Magnesium. In other words:

1g	= 2mL	= 4mmol
2g	= 4mL	= 8mmol
4g	= 8mL	= 16mmol

- For each of the indications listed below, the dose is shown exactly as the doctor should prescribe it on the fluid section of the UHL drug chart

## Side effects and their management

Magnesium toxicity can be assessed clinically as it may cause respiratory depression, loss of deep tendon reflexes or a reduction in urine output to below 20mL / h. This is unlikely to occur as a result of the bolus doses used in the ED but may be seen with maintenance infusions.

The Magnesium Sulfate infusion should be halted if any of the above is recognized.

If respiratory depression is observed, give Calcium Gluconate 1G = 10mL IV over 10min.

## Indications and doses

### Asthma

For patients with either life-threatening features, or severe features persisting after initial treatment. See also [ED asthma management proforma](#).

Dose (give only once): **2G over 20min**

Date	Infusion fluid		Additions to infusion		IV or SC	Line	Start Time	Time to run or ml/hr	Fluid Batch No.	Prescriber
	Type/strength	Volume	Drug	Dose						
DD/MM/YY	0.9% NaCl	100ml	Magnesium Sulfate 50%	2G = 4ml	IV		HH:MM	312ml/h		Dr.'s Name

### Eclampsia and severe pre-eclampsia

- Eclampsia is defined as the occurrence of seizures superimposed on pre-eclampsia. Magnesium Sulfate is drug of choice for the initial (and, if required, first subsequent) seizure.
- In pre-eclampsia or HELLP syndrome, discuss options with duty obstetric middle grade. Magnesium Sulfate is usually given once a decision to deliver has been made.
- NB:** The doses and rates given below are the same as recommended in NICE guideline [NG133](#) and the [UHL maternity guideline](#), but **preparation and infusion details differ due to Maternity using magnesium 20% instead of 50% ampoules to make up the infusions.** The ED does not intend to stock 20% ampoules to avoid confusion and drug errors.

Initial dose: **4G over 10min**

Date	Infusion fluid		Additions to infusion		IV or SC	Line	Start Time	Time to run or ml/hr	Fluid Batch No.	Prescriber
	Type/strength	Volume	Drug	Dose						
DD/MM/YY	0.9% NaCl	100ml	Magnesium Sulfate 50%	4G = 8ml	IV		HH:MM	648ml/h		Dr.'s Name

Maintenance dose: **1G per hour**

Date	Infusion fluid		Additions to infusion		IV or SC	Line	Start Time	Time to run or ml/hr	Fluid Batch No.	Prescriber
	Type/strength	Volume	Drug	Dose						
DD/MM/YY	0.9% NaCl	192ml	Magnesium Sulfate 50%	24G = 48ml	IV		HH:MM	10ml/h		Dr.'s Name

Dose for recurrent seizure: **2G over 10min** (may be repeated once)

Date	Infusion fluid		Additions to infusion		IV or SC	Line	Start Time	Time to run or ml/hr	Fluid Batch No.	Prescriber
	Type/strength	Volume	Drug	Dose						
DD/MM/YY	0.9% NaCl	100ml	Magnesium Sulfate 50%	2G = 4ml	IV		HH:MM	624ml/h		Dr.'s Name

**NB:** Treat further seizures as per standard seizure guidelines

### Torsade des pointes – polymorphic VT

Magnesium is first line treatment if stable. If unstable treat with synchronised DC shock. If pulseless treat with unsynchronised DC shock.

Dose: **2G over 10min**

Date	Infusion fluid		Additions to infusion		IV or SC	Line	Start Time	Time to run or ml/hr	Fluid Batch No.	Prescriber
	Type/strength	Volume	Drug	Dose						
DD/MM/YY	0.9% NaCl	100ml	Magnesium Sulfate 50%	2G = 4ml	IV		HH:MM	624ml/h		Dr.'s Name

## Atrial fibrillation (AF)

Magnesium may be useful to help achieve both rate and rhythm control in fast AF.

Dose: **4G over 1h**

Date	Infusion fluid		Additions to infusion		IV or SC	Line	Start Time	Time to run or ml/hr	Fluid Batch No.	Prescriber
	Type/strength	Volume	Drug	Dose						
<i>DD/MM/YY</i>	<i>0.9% NaCl</i>	<i>100ml</i>	<i>Magnesium Sulfate 50%</i>	<i>4G = 8ml</i>	<i>IV</i>		<i>HH:MM</i>	<i>108ml/h</i>		<i>Dr.'s Name</i>

## Hypokalaemia

Give magnesium routinely in the initial management of severe hypokalaemia without first awaiting plasma magnesium level (it may often not be possible to raise serum potassium otherwise, as hypomagnesaemia often coexists with hypokalaemia, causing renal potassium wasting due to impairment of the Na-K-ATPase). Further doses should be guided by magnesium level.

Dose: **2G over 20min**

Date	Infusion fluid		Additions to infusion		IV or SC	Line	Start Time	Time to run or ml/hr	Fluid Batch No.	Prescriber
	Type/strength	Volume	Drug	Dose						
<i>DD/MM/YY</i>	<i>0.9% NaCl</i>	<i>100ml</i>	<i>Magnesium Sulfate 50%</i>	<i>2G = 4ml</i>	<i>IV</i>		<i>HH:MM</i>	<i>312ml/h</i>		<i>Dr.'s Name</i>