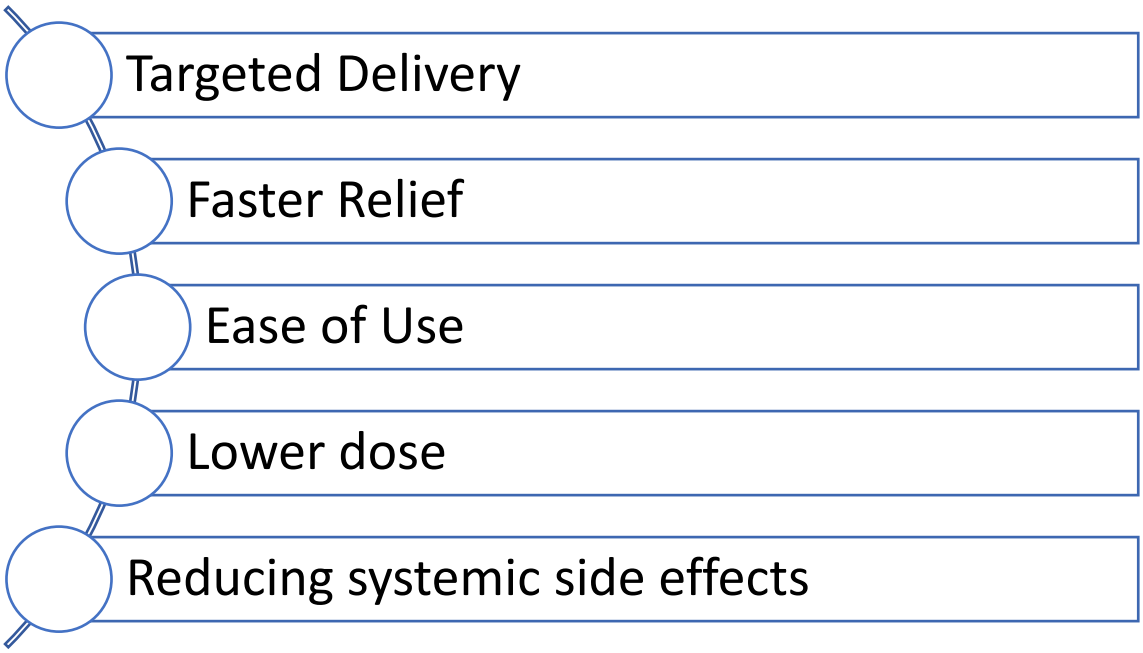
RARE MEDICATIONS ADMINISTERED VIA NEBULISERS

- DR.SRIRAM G.M, DR.K.KARTHIKA

Nebulized drugs are medications administered via a nebulizer, a device that converts liquid medication into a fine mist that can be inhaled directly into the lungs.

ADVANTAGES:



N-ACETYLCYSTEINE

- Mucolytic
- Acetyl cysteine is used for certain lung conditions when increased amounts of mucus make breathing difficult. Acetyl cysteine liquefies or dissolves the mucus so that it may be coughed up. Sometimes the mucus may have to be removed by suction.

For inhalation dosage form (solution):

Adults and children - 3 to 5 ml of a 20% solution or 6 to 10 ml of a 10% solution used in a nebulizer three or four times a day. The medicine is inhaled through a face mask, mouthpiece, or tracheostomy.

The 10% or 20% solution may be used for inhalation as a heavy mist in a tent or croupette.

Sometimes the 10% or 20% solution is placed directly into the trachea or through a catheter into the trachea for certain conditions.

TRANEXAMIC ACID

- Pulmonary hemorrhage is a life-threatening condition characterized by blood leakage into lung tissues, leading to severe respiratory distress.

Nebulization: Diluted with 0.9% Saline

Adult dose: 500mg/5ml administered 3 to 4 times daily

Pediatric dose: 250 - 500 mg/dose every 6 to 12 hours

Evidence suggests that nebulized Tranexamic acid effectively controls bleeding in pulmonary hemorrhage with a hemostatic efficacy comparable to systemic administration, but with a lower risk of venous thrombosis.

MAGNESIUM SULPHATE

- Nebulized magnesium sulphate improves pulmonary expiratory flow function and reduces the need for ICU admission in patients with acute exacerbation of COPD.
- Uses: Acute Asthma Exacerbations, Chronic Obstructive Pulmonary Disease (COPD), Bronchospasm
- When inhaled, magnesium sulphate works by:
    - Relaxing bronchial smooth muscles
    - Reducing inflammation in airways
    - Inhibiting calcium influx into smooth muscle cells
    - Stabilizing mast cells and reducing histamine release

Compatibility:

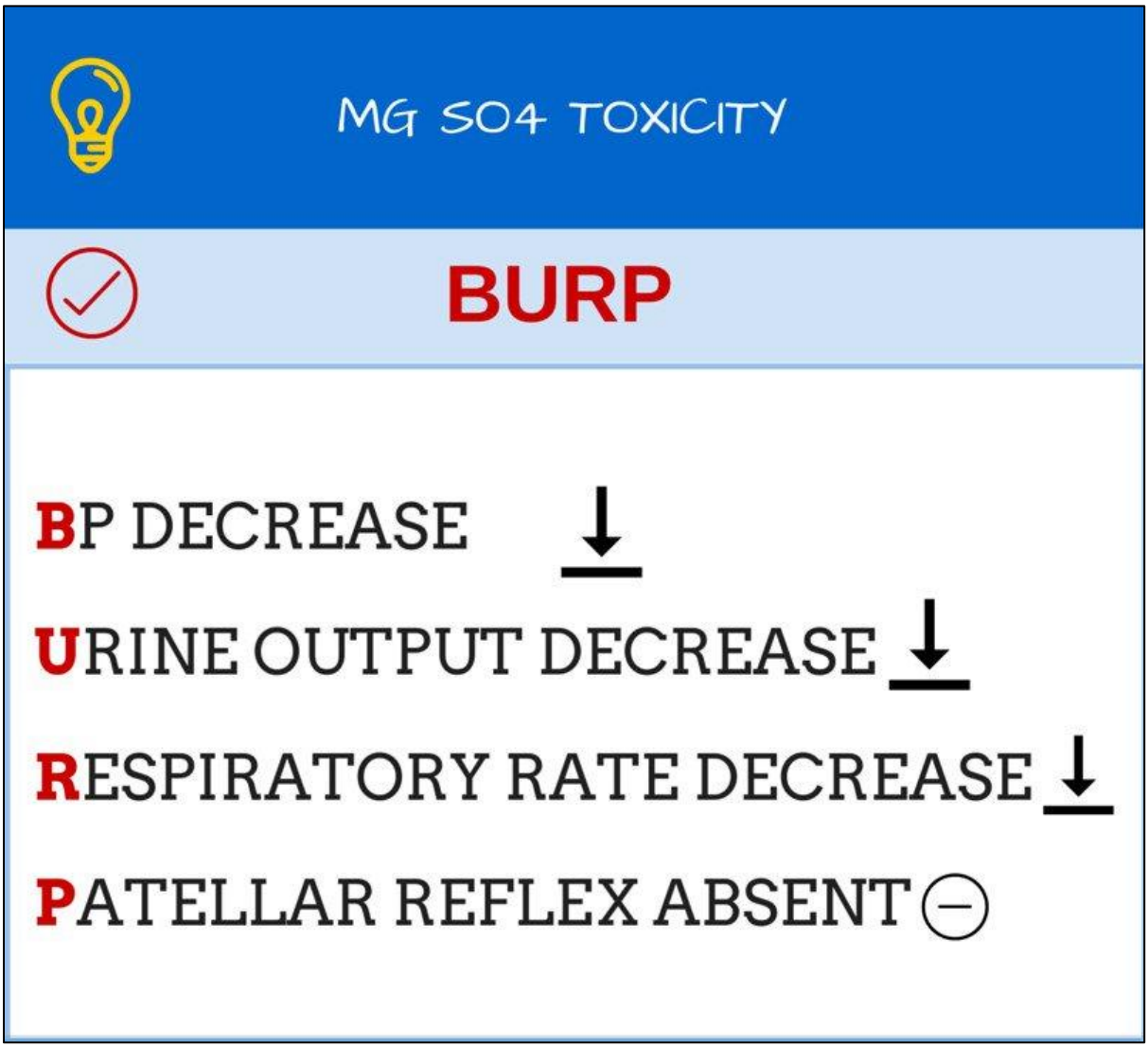
Magnesium sulphate for inhalation is generally compatible with:

- **Nebulizer solutions**: Often mixed with saline or combined with beta-agonists like albuterol
- **Standard nebulizer equipment**: Compatible with most conventional nebulizers
- **Concurrent medications**: Generally, can be used alongside other respiratory medications

Important Considerations:

- **Concentration**: Typically used in concentrations of 150 - 250 mg/ml

- **Monitoring**: Patients should be monitored for signs of magnesium toxicity



- **Not first-line**: Generally used when conventional bronchodilators have not provided sufficient relief
- **Healthcare setting**: Typically administered in emergency or hospital settings rather than for routine home use.

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ADMINISTRATION AND STORAGE GUIDELINES FOR COMMONLY USED SYRUPS

- **DR.V.SANTHANA KUMAR, DR.K.KARTHIKA**

POTASSIUM CITRATE, MAGNESIUM CITRATE & VITAMIN B6 ORAL SOLUTION

- Alkalinizing agent
- Indications: treatment of renal tubular acidosis, to prevent the recurrence of calcium oxalate nephrolithiasis (calcium oxalate stones) and uric acid lithiasis (uric acid stones) and to provide relief from burning sensation during urination.
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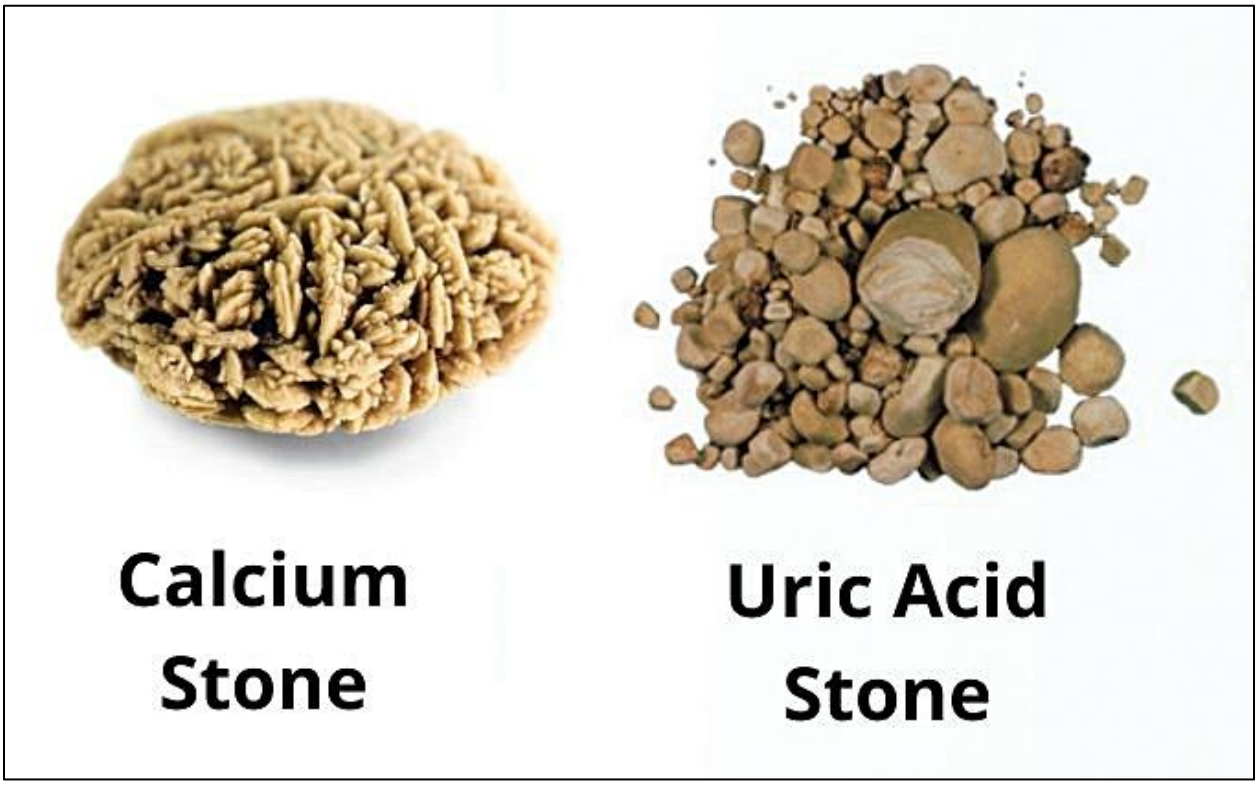

- Oral citrate solutions should be diluted with adequate amounts of water prior to administration to minimize the risk of gastrointestinal complications, and followed by additional water after administration. Oral citrate solutions should preferably be taken after meals to avoid its saline laxative effect.
- The recommended dosage is 2-3 teaspoonful BID, diluted with one glass of water, after meals.
- Store in a cool and dry place away from sunlight.

DISODIUM HYDROGEN CITRATE SYRUP - CITRALKA

- To render the urine alkaline in conditions such as pyelitis, cystitis, urethritis, urolithiasis and during treatment of urinary tract infections with antibiotics whose action is enhanced by an alkaline pH such as Sulphonamides and Fluroquinolones
- To overcome the tendency to acute or chronic metabolic acidosis in acute infections and dehydration.
- Dose:
  Adults: 30 ml (two tablespoonful's) 4 times daily.
  Children 6 to 12 years: 10 or 15 ml (two or three teaspoonful's) 3 to 4 times daily.
- To be taken in water or milk. Adults may take it without dilution, followed by liquid, if preferred.
- Contraindications: patients with severe renal impairment and associated oliguria, azotemia or anuria; untreated Addison's disease; acute dehydration; heat cramps; and severe myocardial damage. In addition, sodium salts are contraindicated in patients on sodium restricted diet.

POTASSIUM CHLORIDE ORAL SOLUTION

- Potassium chloride is indicated for the treatment and prophylaxis of hypokalemia in patients for whom dietary management with potassium-rich foods or diuretic dose reduction is insufficient.
- Dilute the potassium chloride solution with at least 4 ounces of cold water Take with meals or immediately after eating.
- If serum potassium concentration is less than 2.5 mEq/L, use intravenous potassium instead of oral supplementation.
- Dose:
  Treatment of hypokalemia:

  Daily dose: 40 to 100 mEq. Give in 2 to 5 divided doses: limit doses to 40 mEq per dose. The total daily dose should not exceed 200 mEq in a 24-hour period.

  Maintenance or Prophylaxis: 20 mEq per day.

- Paediatric Dose:
  Treatment of hypokalemia:

  Pediatric patients aged birth to 16 years old: The initial dose is 2 to 4 mEq/kg/day in divided doses; do not exceed as a single dose 1 mEq/kg or 40 mEq, 100 mEq.

  If deficits are severe or ongoing losses are great, consider intravenous therapy.

- DOSAGE FORMS AND STRENGTHS:
  Oral Solution 10%: 1.3 mEq potassium per mL.

  Oral Solution 20%: 2.6 mEq potassium per mL.

- CONTRAINDICATIONS: patients on potassium sparing diuretics.
- WARNINGS AND PRECAUTIONS: May cause gastrointestinal irritation if administered undiluted. Increased dilution of the solution and taking with meals may reduce gastrointestinal irritation.

- Store at Controlled Room Temperature, 25°C (77°F); excursions are permitted to 15° - 30°C. Protect from light.

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PREVENTING MEDICATION ERRORS

- Sr.Y.J.Salomy Suhirtharani, Dr.K.Karthika

AT THE PHYSICIAN'S LEVEL:

- ❖ Ensuring prescription legibility through "Write in Capital Letters" policy
- ❖ Medication orders and prescription to include both generic and brand name along with dose, strength, directions for use
- ❖ Implementation of "Verbal order policy" for oral orders
- ❖ Protocols for High-risk Medication usage (e.g Anticoagulants)

- Usage of standardized abbreviations & acronyms throughout the
- organization
- Introduction of Hospital Formulary
- “Tall man” (mixed case) lettering to emphasize drug name differences (example: RABEprazole and ARIPiprazole)
- Regular Prescription audit followed by appropriate Corrective and Preventive Actions (CAPA)

AT THE NURSE’S LEVEL:

- Labeling all the medications before preparing
- All the medicines and labels to be verified by two qualified nursing professionals before administration (Double-checking)
- Not more than one medication to be labeled at one time
- All the unlabeled medications should be discarded immediately
- Continuous training and updating on LASA (Look-alike or sound-alike) and High-risk medications and Medication Error reporting
- Separate storing of LASA and High-risk medications

AT THE PHARMACIST’S LEVEL:

- Ensuring dispensing is carried out by competent individuals
- Separate storing of LASA and High-risk medications
- Implementation of Medication error reporting culture
- Continuous training and updating on LASA and High-risk medications
- Training on Hospital Formulary and Good Pharmacy Practices

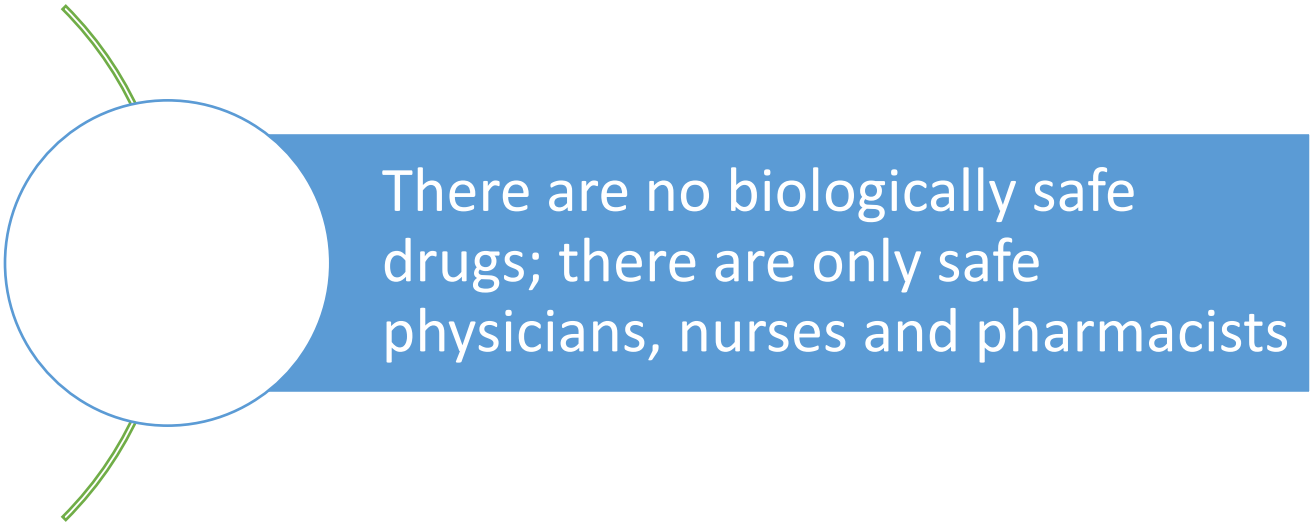
AT THE MANAGEMENT LEVEL:

- Development of a blame-free & punishment-free culture of medication error reporting
- Punitive action is not an effective way to prevent recurrence
- Medication error does not signify faulty personnel
- It signifies faulty systems that need to be made safer
- Establishment of a voluntary reporting system which does not lead to blaming and shaming of the individual care provider
- Dedicated personnel / Team to collect and analyze Medication errors and to devise strategies for process improvement

ROLE OF INFORMATION TECHNOLOGY IN REDUCING ERRORS - COMPUTERIZED PHYSICIAN ORDER ENTRY:

- Reduce errors / adverse drug events by 55 - 80%
- Produce legible and complete orders
- Flag laboratory results that affect prescribing
- Inform the prescribing physicians of the drug interactions, allergies, and duplication of drugs
- Transmit orders to the pharmacy as soon as it is written down
- Minimize dosing errors

❖ Automatically calculate the total doses.



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